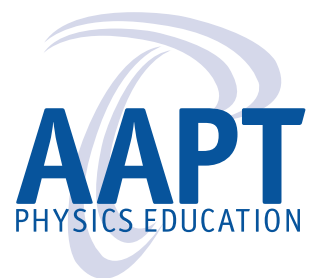


American Association of Physics Teachers

2019 ANNUAL REPORT



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2019 in Review

PRESIDENT'S 2019 REPORT

Mel Sabella 1

EXECUTIVE OFFICER'S 2019 ANNUAL REPORT

Beth A. Cunningham. 3

PUBLICATIONS 6

ELECTRONIC COMMUNICATIONS 9

NATIONAL MEETINGS. 11

WORKSHOPS AND PROGRAMS 17

2019 HIGH SCHOOL PHYSICS PHOTO CONTEST 19

COLLABORATIVE PROJECTS 20

2019 AWARDS AND GRANTS 22

MEMBERSHIP 27

FUNDRAISING 28

COMMITTEE CONTRIBUTIONS 30

2019 AREA COMMITTEES 30

2019 ADVISORY COMMITTEES 32

AAPT SECTION REPRESENTATIVES 34

FINANCIALS. 35

2019 IN MEMORIAM 36

President's Report

MEL SABELLA



2019 started with excitement and enthusiasm for our work in enacting the new AAPT Strategic Plan and much of our attention focused on how to leverage AAPT experience and expertise to best serve the broad physics and physics education community. Our Strategic Plan provides a roadmap for where AAPT would like to be in the next five to ten years. The Plan supports and rearticulates our organization's mission, objectives and values.

Enacting the Strategic Plan over the next few years will require AAPT to be attentive to guiding principles, the resources and expertise within the organization and beyond, and themes that are important to our members, AAPT staff, and the Board.

The four goals in the strategic plan are not stand alone goals - they are synergistic, and when looked at collectively, they help the organization focus its support and attention on programs and activities that:

- ensure that all teachers have access to best practices and high quality instructional materials that meet their needs and support their efforts in curriculum development;
- create learning spaces that leverage student expertise and establish classrooms where instructors are informed by students, are attentive to student culture, and are culturally sensitive. These learning spaces should foster inclusivity by being anti-oppressive and anti-racist.
- support diverse, emerging leaders, at all levels of physics education and engage the next generation of physics educators striving to create equitable, inclusive, and diverse physics classrooms.

Central to successfully enacting our Strategic Plan is strengthening relationships within and beyond the organization and supporting the members of our community who are either currently engaging in this work or want to become more involved in this work. In 2019, we established new lines of communication and opportunities for co-thinking with AAPT Area Committees and we encouraged membership to take on additional roles and leadership within the organization. We continued the work from 2018 and continued to hold AAPT President Town Hall meetings to provide additional feedback and avenues for ideas. Board members directly connected with Area Committee leaders and engaged in collaborative meetings.

These efforts were guided by four questions:

- How can we create structures that ensure that ideas from all members are heard?
- How can AAPT's governance structure evolve to aid the organization in moving big ideas forward?
- How can we best support the strategic work of Area Committees?
- How can we get more members, especially, early career members, active in committee work and leadership efforts?

Diversity, equity, and inclusion are central to AAPT's mission and one of the four goals in the Strategic Plan. It is a goal that must be part of everything we do as an organization.

- In the last three years, each of our national meetings have included free workshops for our members led by experts who focus on equity and inclusion.
- We continued to think about bringing in early career members into AAPT governance and leadership and laid out a framework for the action items that will be implemented in 2020 and beyond.
- In 2019, AAPT received a generous donation from Robert "Doc" Brown to endow a new award that recognizes early-career members who demonstrate excellence in their contributions to AAPT and physics education and exhibit the potential to serve in an AAPT leadership role.
- In 2019, AAPT joined the Society Consortium on Sexual Harassment in STEM. AAPT

is also a leader in the STEMM Equity Achievement (SEA) Change, which focuses on supporting “institutional transformation in support of diversity, equity, and inclusion, especially in colleges and universities.

During 2019, we continued to ramp up our efforts to engage in policy and advocacy work, building on the momentum of the Congressional Visits that AAPT membership and AAPT leadership engaged in while we were in Washington D.C for the Summer 2018 Meeting. Policy and Advocacy work depends on relationship building and these efforts take time. To support our efforts in policy and advocacy, in 2019, we worked with the fantastic Public Policy Team at the American Institute of Physics to craft 1-pagers that articulated AAPT’s suggested actions for Congress. These included recommending increased funding for the National Science Foundation, opposing cuts to the Department of Education and supporting legislation to Combat Sexual Harassment in Science. We are extremely grateful to the AIP Public Policy Team for their continued support in this work.

AAPT’s impact on physics and physics education are significant and the impact and benefits extend well beyond our membership, as students in classes taught by AAPT members benefit from innovative, active, research-based instructional materials. In June 2019, I had the opportunity to share AAPT’s efforts in Scientia ([https://www.scientia.global/the-american-](https://www.scientia.global/the-american-association-of-physics-teachers/)

[association-of-physics-teachers/](https://www.scientia.global/the-american-association-of-physics-teachers/)). Preparing for this interview reminded me of all the ways the members of our organization serve each other, the broader community of physics educators, and the broad community of students at all levels. The ways in which AAPT supports our mission to ‘enhance the understanding and appreciation of physics through teaching’ continue to evolve as the organization changes and the world changes.

The next few years will be challenging and exciting for AAPT and for Physics Education broadly. AAPT plays an important role in how our learning spaces evolve. Using the Strategic

Plan as a lever, AAPT highlighted four priorities at the end of 2019: Diversity, Equity and Inclusion, Energy, the Environment, and Climate Science, Quantum Information and Quantum Computing, and The Physics of Living Systems. These priorities will guide the next stage of our work around the Strategic plan.

2020 has been a challenging year on many fronts - we are experiencing a global pandemic and we are witnessing a series of acts of systemic oppression, violence, and racism. These events in 2020 significantly affect our instruction and continue to remind us about the importance of our goal of moving toward more equitable learning spaces. These events have also reminded us about the power of community and the importance of supporting each other in doing the hard work we do. Seeing AAPT friends at our virtual coffee hours, in the TYC Friday discussions, and at our first virtual meeting in July helped many get through a challenging spring and summer. I’m always hopeful when I see the fantastic work and thoughtfulness of our members, our staff, and our Board of Directors. Our community is extremely generous, giving their time and expertise to tackle the challenging issues we face in education. I am extremely grateful for having the opportunity to serve as President for an organization that has given me so much.

Sincerely yours,



Mel Sabella

"AAPT's impact on physics and physics education are significant and the impact and benefits extend well beyond our membership."



Executive Officer's 2019 Annual Report

BETH A. CUNNINGHAM

We have had another busy year in 2019. This short report provides a summary of those activities as well as a preview of the work we will do in 2020 and beyond. I am not able to mention all of the important 2019 activities. This summary should give you a taste of the most visible or important activities that the Executive Office led.

Before describing 2019 accomplishments, the staff needs to be recognized for their hard work and contributions. AAPT's successes are supported by a very committed and loyal staff. The AAPT staff helps the vision of the AAPT Board of Directors and all of the volunteer members come to fruition. I am very grateful for the contributions that the AAPT staff made in 2019, many of which were behind the scenes. We have also seen a few AAPT staff members move onto new, exciting opportunities. Rebecca Vieyra, K-12 Program Manager, left AAPT in the fall to take a position at the Office of American States. Kelsey Sheridan, Marketing Coordinator, went to the Hopkin's Center for Talented Youth in early 2019. Rachel Sweeney, Executive Assistant, went to the Pew Research Center in mid-year. We welcomed the following new staff in 2019:

- Mark Hannum, K-12 Program Manager. Mark has almost 20 years of high school physics teaching experiences and his last position was at Thomas Jefferson High School for Science and Technology in northern Virginia.
- Jerri Anderson, Marketing Coordinator. Jerri has experience in marketing including a recent position at the American Chemical Society.
- Lutrina Jackson, Executive Assistant. Lutrina has over 10 years of executive assistant experience in the public sector.

One of the most exciting developments in 2019 is the passage of a new strategic plan. The Board approved it at the 2019 Winter Meeting and the work to implement it has begun.

The approval is a culmination of work during the preceding year of reviewing the previous strategic plan and gathering data to help inform the Board of the most important goals to pursue. President Sabella describes this process and the next steps in more detail in his report.

You might remember that we entered into an agreement in 2018 with Mercyhurst University to be able to offer graduate credit for AAPT professional development activities. We were able to offer this option for the first time for teachers who participated in the 2019 AAPT AIP Policy Fellowship program. We learned much about the process of granting graduate credit and we hope to have an improved process for the next time we offer this. We hope that this new

collaboration will allow our K-12 and two-year college community to advance their careers. Look for other opportunities to receive graduate credit for AAPT workshops and events in the coming years.

This was the first year of the long-term agreement with our publisher, the American Institute of Physics Publishing. We have published with AIP since AAPT's formation in 1930. In fact, AAPT is one of the organizations that created AIP in response to the financial challenges of the Great Depression and to achieve economies in publishing journals. We have already benefited from the agreement by experiencing cost savings on the production and mailing of our

"AAPT's successes are supported by a very loyal and committed staff. The AAPT staff helps the vision of the AAPT Board of Directors and all of the volunteer members come to fruition."

two journals, increasing efficiencies in the processing of manuscripts, and having access to critical information in publishing as the landscape continues to evolve. In 2019 we also decided to move forward with an agreement with AIP Publishing to publish AAPT books. This partnership will allow AAPT to concentrate on attracting authors to write books that physics educators can use for their professional development. Watch for more information about the publication of new books as well as access to AAPT books in the backlist.

We remain very successful in obtaining Federal and private grant funding to support AAPT's activities. The following new projects were funded in 2019:

- “Master Teacher Instructional Leaders: Underrepresented Teachers of Physics Fellowship” - The Fellowship partners early career or pre-service Physics teachers from underrepresented populations with more established Physics teachers who are also from underrepresented populations to build a community of experts all working to increase diversity of physics teachers, and the broader field of physics. For more information, see https://aapt.org/K12/utop_program.cfm?csSearch=30620_1. This project is supported by the American Institute of Physics Venture Partnership Fund.
- “Expanding Access to Learning Beyond the First Year Physics Laboratories: ALPhA's Immersion Workshops for Faculty Development.” In partnership with the Advanced Laboratory Physics Association, this project continues the immersion experiences that provide participants with two to three days of intensive hands-on work with a single advanced laboratory experiment. Funded by the National Science Foundation (award number 1940925).
- “Energy and Equity: Changing the Climate of Secondary Physics Teaching and Learning” - This project supports the Energy and Equity Portal for high school teachers which provides resources around a robust model of energy, grounded in the Next Generation Science Standards. The model is also intentionally constructed to support engagement with current sociopolitical issues. For more information, see <https://www.energyandequity.org>. This project is funded by the National Science Foundation (award number 1907950).
- “STEM Equity Achievement Change (SEA Change) Physics and Astronomy Department Award Pilot” - The American Association for the Advancement of Science (AAAS) has developed the STEM Equity Achievement (SEA) Change Project (<http://seachange.aaas.org>) which supports systemic, structural institutional transformation around diversity and inclusion in colleges and universities. AAAS has been working with AAPT, American Institute of Physics member societies, and AIP affiliates to develop SEA Change Departmental Awards parallel to the SEA Change Institutional Awards. These awards would foster and support structural change around diversity and inclusion within academic

departments. This project is funded by the American Institute of Physics Venture Partnership Fund and will support a pilot of the physics and astronomy departmental award.

As described in previous annual reports, our events are held under the Event Participation Code of Conduct (see https://aapt.org/aboutaapt/organization/code_of_conduct.cfm). We continue to educate attendees about the Code of Conduct and appropriate behavior at our events. We did not have any incidents that were reported in 2019. Also in 2019, we joined over 100 other scientific, engineering and medicine societies in the newly created Societies Consortium on Sexual Harassment in STEM (https://societiesconsortium.com). The Societies Consortium is developing model policies and practices that professional societies can use to create welcoming and inclusive environments at their events. In addition, the Societies Consortium serves as a convener to build community around changing the climate and culture of science,

engineering, and medicine. As the Societies Consortium notes, societies “have a unique role in setting standards of excellence, and influencing and assisting all STEM fields’ participants as they seek to achieve-and to be recognized by societies for achieving-excellence.” Look for additional work in this area in 2020 and beyond using the policies and practices developed by the Societies Consortium.

“In 2019 we also decided to move forward with an agreement with AIP Publishing to publish AAPT Books. This partnership will allow AAPT to concentrate on attracting authors to write books that physics educators can use for their professional development.”



We continue to have successes as well as challenges. AAPT's finances continue to be relatively healthy and our reserves have had an excellent performance in 2019. However, we continue to see a decline in our K-12 membership numbers. This is a phenomenon being experienced by many other professional societies that support the K-12 STEM community. We rely on current members to articulate the value of an AAPT membership. We hope you will assist AAPT in bringing in new members, particularly those teaching high school physics.

We hope you continue to see value in membership and continue to renew. We also ask that you consider making a contribution to the annual fund or to a program that resonates with you (see the AAPT website for complete list). Finally, spread the word about the value of an AAPT membership to your colleagues (especially those entering the profession), friends, and students. AAPT is stronger with a robust and diverse group of members.

Sincerely yours,

Beth A. Cunningham

Publications

Having a strong publications program enables AAPT members to obtain greater insight into physics and learn about new teaching methods.

AMERICAN JOURNAL OF PHYSICS (AJP.AAPT.ORG)

Richard Price, Editor, Massachusetts Institute of Technology
Joseph D. Romano, Assistant Editor

AJP continued to inform physics education globally with member subscriptions, institutional subscriptions, such as libraries and physics departments, and consortia agreements. The mission of the American Journal of Physics (AJP) is to publish articles on the educational and cultural aspects of physics that are useful, interesting, and accessible to a diverse audience of physics students, educators, and researchers. Our audience generally reads outside their specialties to broaden their understanding of physics and to expand and enhance their pedagogical toolkits at the undergraduate and graduate levels.

AMERICAN JOURNAL OF PHYSICS STATISTICS

- 12 issues—January–December 2019 (Volume 87)
- 960 pages, 668 reviewers, 78 papers published—13% acceptance rate (?)
- 4 open access articles
- 8,730 individual and institutional subscriptions
- Approximately 56% of subscribers teach at the college and university level and 24% teach at the high school level. The remaining 20% are scientists at research facilities, students, and other interested members of the physics community.

Resource Letters - 3 letters

Resource Letters Editorial Board: Ray Burnstein, Jon Gaffney Anthony Kuchera, Anne Goodsel, Amy Graves, Nadia Kaltcheva

Research in Physics Education - 8 articles

Computational Physics - 5 articles

Apparatus and Demonstration Notes - 11 articles

Notes and Discussions - 6 articles

Back of the Envelope - 5 articles

Seasonal Articles - 1 articles

Book Reviews - 16 reviews

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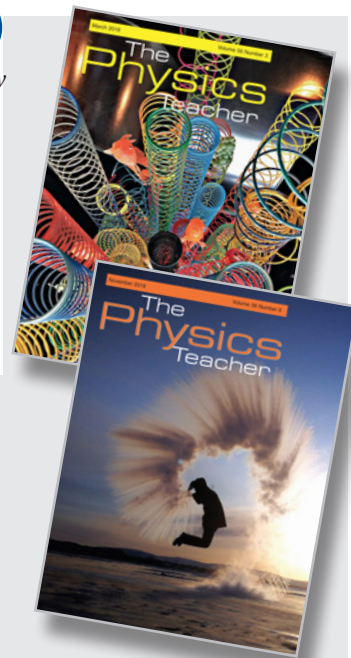
Daniel V. Schroeder
Weber State University

Publications

THE PHYSICS TEACHER (TPT.AAPT.ORG)

Gary D. White, Editor, *The George Washington University*

The Physics Teacher (TPT) continues the mandate of supporting, inspiring, and challenging our target audience—high school and college teachers of introductory physics—as well as our many other readers. In December, a Call for Papers was issued on the topics of sex and gender in the introductory physics classroom, an invitation to write and submit manuscripts to *TPT* covering as many facets of these subjects as can be imagined. Articles submitted in response to the call that successfully make it through the *TPT* double-blind peer-review process are to be featured in upcoming issues of *TPT*. See the editorial in the December 2018 issue of *TPT* for more details



COLUMN EDITORS

And the Survey Says...

Susan C. White, AIP, College Park, MD

AstroNotes

Joe Heafner, Catawba Valley Community College, Hickory, NC

Fermi Questions

Larry Weinstein, Old Dominion University, Norfolk, VA

Figuring Physics

Paul G. Hewitt, City College of San Francisco, San Francisco, CA

iPhysicsLabs

Jochen Kuhn, University of Kaiserslautern, Germany

Patrik Vogt, Realschule Plus Herxheim, Herxheim, Germany

Little Gems

Chris Chiaverina, New Trier High School, Winnetka, IL

Physics Challenge for Teachers and Students

Boris Korsunsky, Weston High School, Weston, MA

Talkin' Physics

Dolores Gende, North Broward Preparatory School, Coconut Creek, FL

Technology in the Classroom

James Lincoln, Physics Videos.com, Newport Beach, CA

Visual Physics

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THE PHYSICS TEACHER STATISTICS

- 9 issues—January–May, September–December 2019 (Volume 56)
- 576 pages, 597 reviewers, 119 papers, and 90 contributions to monthly columns (103 international authors/co-authors)—34% acceptance rate
- 8,352 individual and institutional subscriptions
- Approximately 40% of subscribers teach at the college and university level and 33% teach at the high school level. The remaining 27% are scientists at research facilities, students, and other interested members of the physics community.

Electronic Communications



The AAPT supports its members and the physics education community at large by hosting and sharing resources online for instructors and students. AAPT/ComPADRE provides traditional digital resource libraries for K-12 and higher education audiences, community-focused online collaborations for developing and sharing curricular content, recommendations and best practices for physics instructors, and proceedings of national physics education conferences. AAPT/ComPADRE collaborates with many authors, projects, and organizations to highlight the best in physics education.

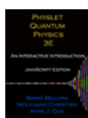


Living Physics Portal: The Living Physics Portal, a collaboration of curriculum developers and education researchers with expertise in introductory physics for life sciences courses, enables peer-to-peer curriculum sharing and support. The portal was available for beta-test users in 2019. More than 200 instructional modules were added to the portal in 2019, with about half these resources submitted for and receiving an editorial review. 300 users joined the portal to take advantage of the available materials and about two dozen instructors participated in three “curriculum swap” events.

NEXUS Physics: The AAPT/ComPADRE staff collaborated with the authors of NEXUS Physics to create a new, online home for the content developed in this project. While the Living Physics Portal is meant for instructors, the NEXUS Physics Wiki provides students reading materials, worked examples, and problems.



PICUP: The PICUP collaboration promoting computation in the physics curriculum uses the AAPT/ComPADRE web infrastructure. Ongoing efforts are focused on increasing contributions, peer review, and supporting PICUP workshops. A Faculty Commons section of the site for sharing smaller resources has received significant use since its launch.



Physlet Quantum Physics: The third edition of Physlet Quantum Physics was published in 2019. This is an interactive, simulation-based exploration of topics in quantum physics and relativity. The simulations in this online edition have been translated to JavaScript so that they run on computers, laptops, and mobile devices.

PhysPort: Physport is a collection of research-based resources for physics instructors. PhysPort Expert Recommendations were very popular in 2019. These short articles explain best practices and education research results for the average physics instructor. Use of PhysPort increased by 50% over 2018.

Curricula Sharing: An easy-to-use interface for sharing curricular materials has been used by several authors to make their materials available. Examples of these shared materials include the Maryland Open Source Tutorials, Just in Time Teaching,

Physlets Instructor Guides, Thinking Critically in Physics Labs, and the Lawrence University computational resources.

Conferences: AAPT/ComPADRE again provided the web infrastructure to host the web interface and publish the proceedings of the 2019 Physics Education Research Conference. Proceedings for all PERCs are available on PER Central.

Traffic Report: Overall, ComPADRE served over 600,000 users for more than 800,000 sessions in 2019, an increase of more than 20% over the previous year.

Electronic Communications

AAPT.ORG

Having strong online publications offers AAPT members convenient access to physics education resources, news, and other member benefits. AAPT.org continues to emphasize ease-of-access and user-friendliness, and aims to be more inviting to new visitors. The landing page includes a new navigation system with many new photos and information pertaining to upcoming or ongoing programs, projects, events, and resources; and buttons to donate, join, and to sign into the e-commerce member website. The new website design implemented in 2018 stresses ease of navigation and will guide visitors based on their role in the physics education community.

Features

AAPT.org organizes the association's many assets into appropriate categories allowing the user (both members and non-members) to easily access information regarding topical news, governance, member benefits and profiles, conferences and workshops, awards, publications, local sections, teaching and student resources, partners, giving, and marketing opportunities.

Added features include.

- A new diversity emphasis which promotes minorities in the sciences using a community management system
- A new member spotlight that highlights those members that are doing or have done significant work on AAPT projects and other projects that support the greater physics education community
- A K-12 portal for high school teachers and students

What's next?

Efforts to enhance AAPT.org are ongoing and numerous. Some areas of activity are the area committee reports, awards nominations, online advertising, member recruitment, and a new books program.

For 2019 aapt.org had:

- 491,327 visits • 1,477,841 pageviews • 3.01pages per visit
- 209,883 new visitors *All from 198 countries/territories*
#1 U.S., #2 India, #3 China, #4 Canada, #5 Philippines

SOCIAL NETWORKING

AAPT continues to open the channels of communication and community using online social networking platforms. Below is a list of online social networks AAPT uses:

- facebook.com/AAPTHQ
- twitter.com/AAPTHQ
- flickr.com/physicsteachers
- youtube.com/physicsteachers
- pinterest.com/AAPTHQ/aboutaapt/socialnetworks.cfm
- instagram.com/AAPTHQ/

AAPT.ORG

AAPT website continues to add content.

MEETING PRESENTATIONS

AAPT continues to preserve content from the national meetings. In addition to meeting abstracts, other content including posters, talks, plenaries, photos, and videos will be archived for future reference. The archive will be searchable. This will be a very useful source of information for members as well as area committees as they plan sessions for future meetings.

eNNOUNCER

The eNNOUNCER, AAPT's electronic newsletter publication, is distributed to members by e-mail. The eNNOUNCER issues are published at the beginning of each month and archived on AAPT.org. The eNNOUNCER contains dates and deadlines for upcoming conferences, meetings, symposiums and events, member news and information, and recent news from the worlds of physics and teaching. Topics covered include organization specific items, action items and notable dates, news from the AAPT Executive Office, member news, section news, recommended reading, and science and education news.

eNNOUNCER TOPICS

eNNOUNCER publishes monthly news for members including:

- Recent AAPT related events and programs
- Members in the news
- Section news
- Workshops and topical conferences
- Scholarship and fellowship announcements
- Awards announcements
- Science related festivals
- Video and photo contests
- Career and teaching opportunities



eNNOUNCER July 2019

[Privacy Statement](#)

[Table of Contents](#)

AAPT News

Get involved in AAPT! Many opportunities!

AAPT members tell us that one of the best things about being a member is that AAPT provides a platform for giving back to the community. When you look at the diverse variety of AAPT activities, you see that the value in the organization comes from its members, their expertise, and their service to the community of physics educators.

There are many opportunities to learn about the efforts of AAPT and its members, and we have opportunities for you, to engage in activities that contribute to AAPT's mission to "enhance the understanding and appreciation of physics through teaching." The way we, as members, support this mission continues to evolve as the organization changes and the world changes. [Read more](#)

2019 AAPT Board of Directors Election

[AAPT News](#)

- [Get involved in AAPT! Many opportunities!](#)
- [2019 AAPT Board of Directors Election](#)
- [Donate and Nominate: New award for AAPT members who are Early Career Emerging Leaders](#)
- [2019 AAPT Summer Meeting](#)
- [2019 Homer L. Dodge Citation for Distinguished Service to AAPT Announced](#)
- [2019 AAPT Fellows Awards Announced](#)
- [2019 Millikan Medal Awarded to Tom Greenslade](#)
- [David Jackson to Receive the AAPT 2019 David Halliday and Robert Resnick Award](#)
- [2019 Klopsteg Memorial Lecture Award](#)
- [AAPT Books Program -](#)

2019 TOP AAPT NEWS STORIES

Listed below are highlighted news stories for 2019 from the eNNOUNCER. To read the full story go to <http://www.aapt.org/aboutaapt/ennouncer/index.cfm>.

JANUARY

- Jack G. Hehn Recognized with 2019 Melba Newell Phillips Medal
- Gay Stewart to Receive AAPT 2019 Oersted Medal

FEBRUARY

- The Committee on Research in Physics Education (RiPE) is Committee of the Year
- AAPT-ALPHA Award winner is Natalie Ferris (Dickinson College)

MARCH

- 2018 Barbara Lotze Scholarship for Future Teachers Winners
- Jijia Dong, Named Academic Director of United States Physics Team
- "

APRIL

- Mark S. Hannum, Chosen to Serve as AAPT K-12 Program Manager
- 2019 Millikan Medal Awarded to Tom Greenslade
- David Jackson to Receive the AAPT 2019 David Halliday and Robert Resnick Award
- Klopsteg Memorial Lecture Award - Jody A. Cooley

MAY

- 2019 Homer L. Dodge Citation for Distinguished Service to AAPT to XLaura E. McCullough, Geraldine Cochran, Larry Engelhardt, Brian Pyper

JUNE

- AAPT Congressional Visit Day highlights the importance of effective and inclusive STEM classrooms

JULY

- New award for AAPT members who are Early Career Emerging Leaders
- U.S. Physics Team Travelers Selected for the 2019 International Physics Olympiad

AUGUST

- AAPT Board of Directors established the new AAPT Early Career Emerging Leader (EXCEL) Award
- The U.S. Physics team took home two gold and three silver medals at the 50th IPHO

SEPTEMBER

- STEP UP is mobilizing high school physics teachers to reduce barriers and inspire young women to pursue physics degrees in college

OCTOBER

- interview AAPT President Mel Sabella with Scientia Global

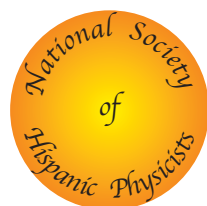
NOVEMBER

- Report on Undergraduate Physics Programs at Hispanic-Serving Institutions is now available online
- Eight AAPT 2017-2018 PAEMST Awardees

DECEMBER

- AAPT's Robert C. Hilborn named a Fellow of the AAAS

National Meetings



AAPT 2019 WINTER MEETING
PHYSICS EDUCATION
January 12-15 Houston, TX

2019
WINTER MEETING



JANUARY 12-15
HOUSTON TEXAS

WINTER MEETING

January 11–15, 2019, Houston, TX

Statistics:

There were 714 attendees, 19 exhibitors, 62 sessions, 27 workshops, 2 Tutorials, 1 Topical Discussion, and 70 posters.

Program Committee Chair
Chandrekha Singh

Paper Sorters:

Trina Cannon, Andy Gavrin, Sarah Formica, Debbie French, Karen Gipson, Tommi Holsenbeck, Daniel Jackson, Eric Kuo, Gen Long, Kenn Lonquist, Marie Lopez del Puerto, Dan MacIsaac, Steve Maier, Adriana Predoi-Cross, Brian Pyper, Charlene Rydgren, Jeff Saul, Daniel Thompson

Local organizer:

Rebecca Forrest and Donna Stokes University of Houston

Highlights

A joint meeting with the National Society of Hispanic Physicists (NSHP), the plenaries, sessions, tutorials and workshops covered a wide range of interests and levels from the novice to the experienced teacher. NSHP sessions included “PER in Latin America and at Hispanic-Serving Institutions in the U.S. and Physics at Hispanic Serving Institutions (HSIs): Challenges and Opportunities

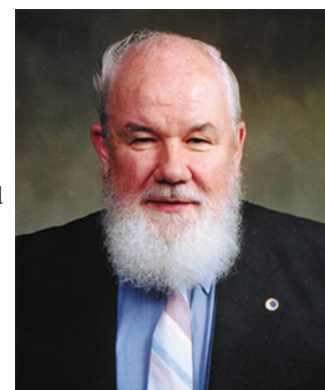
The headquarters hotel for the 2019 Winter Meeting was the Westin Galleria and the Westin Oaks Houston at the Galleria. The University of Houston was host to workshops on Saturday and Sunday with selections ranging from “STEP UP 4 Women” to “Integrating NGSS Practices with the Physics Through Evidence—Empowerment Through Reasoning Suite” and included a full day field trip to the Space Center Houston that took participants to unique historical locations and exposed them to the history of space exploration, including the history of the USA space program. Commercial Workshops were hosted by PASCO Scientific, Expert TA, Perimeter Institute, Pearson, and Vernier.

Attendees also enjoyed a variety of social opportunities such as the First Timer/Early Career Social at Peli Peli, First Timers’ Gathering, Game Room Night, SPS Undergraduate Awards Reception, the Mall Walk, the Early Career Speed Networking event, Field Trip to MD Anderson Cancer Center, and the High School Teachers’ Lounge.

The meeting concluded with the Presidential Transfer where Gordon P. Ramsey turned the Presidential Gavel over to incoming president, Mel Sabella.

Plenaries

Past AAPT President, John Hubisz was honored in a special memorial panel session, John Hubisz: Celebrating 59 Years of AAPT Distinguished Service. In his years of service, John Hubisz touched students, faculty, staff, and friends in K-12 public and parochial schools, two- and four-year colleges, and research universities. Peers and protégés shared fond memories of John’s achievements, and what current AAPT members can do, through the camaraderie, support, and opportunities AAPT offers. John served over 35 AAPT Committees, brought attention to deficiencies in middle school science texts, promoted diversity, raised awareness of senior physicists, and inspired AAPT Sections. He was active in his church, his local community, and a ravenous collector and reader of fine books. Panelists Chuck Stone (Colorado School of Mines), Tom O’Kuma (Lee College), Chris Gould (North Carolina State University), Joe Heafner (Catawba Valley Community College), Aaron Titus (High Point University), Steve Iona (University of Denver), and Jola Hubisz discussed John’s gentle yet effective character. Audience members were invited to share personal perspectives.



Michelle Feynman talked about “Growing Up Feynman” in her plenary talk on Monday. To explain and elaborate on her father’s quirky perspective and personality, Michelle presented an unprecedented, intimate look at what it was like to grow up as a Feynman, complete with vivid personal stories and vibrant photographs. Richard loved public games, catching people off guard, and challenging Michelle’s math teachers, much to her embarrassment. It wasn’t until she was much older that Michelle learned that her father was even considered a genius. Her experience was with that of a loving, clumsy, forgetful, but hard-working teacher that never took himself too seriously.

In his talk, “My 60 Year Romance with the Warped Side of the Universe - and What it has Taught me about Physics Education” 2017 Nobel Laureate Kip Thorne discussed his views, in the context of personal anecdotes about my warped-side research, teaching, mentoring, writing, and outreach. Beginning in his student years in the 1950s and 60s, when Einstein’s general relativity theory suggested that there might be a “warped side” of our universe he learned about objects and phenomena made not from matter, but from warped spacetime. He has devoted most of his career to exploring this warped side through theory and computer simulations, and to developing plans and technology for exploring the warped side observationally, via gravitational waves. Most of his classroom teaching, mentoring, writing, and outreach to nonscientists, has revolved around the warped side; and from this he developed some strong views about physics education.



Awards



Gay Stewart received the Oersted Medal. The 2019 Oersted Medal was awarded to Gay Stewart. Her talk was titled A spectacular Opportunity for the Physics Community to Broaden its Community of Learners.

Gay Stewart received her PhD in physics from University of Illinois, Urbana-Champaign and accepted a faculty position at the University of Arkansas (UA) in 1994. At UA, she focused on three interrelated issues: improving the introductory sequence to better prepare students to succeed in STEM, improving the preparation of physics majors for the variety of career options open to physicists, and the preparation of future faculty, both high school and professoriate. In 2014, Gay transitioned to West Virginia University, where she is Eberly Professor of STEM Education and founding director of the Center for Excellence in STEM Education. The trans-disciplinary center works with faculty across STEM and related disciplines at WVU, partner

programs, and the WVU Department of Education to enhance STEM education and STEM education opportunities, grades K-20. The center also houses the high school STEM teacher program and supports WVU’s PhysTEC implementation. Gay has served in leadership positions in AAPT and APS, and is a fellow of both.

Jack Hehn, recipient of the Melba Philips Award for 2019 spoke of the decades of work accomplished during his career as a physics educator and organizational leader in his talk, “May the Work I Have Done Speak for Me.” Hehn has a wide range of experience in physics and science education having taught and worked with students in elementary school through graduate school. He has served in administrative staff and instructional roles within physics departments for 19 years and spent much time developing and teaching the freshman physical science course for pre-service teachers, developing mentoring and training programs for teaching assistants, and developing instructional laboratory programs using multimedia and interactive computer technologies.



Hehn has served as a reviewer, advisor, and consultant to many physics departments and large-scale projects, and he has developed and implemented leadership workshops for faculty and principal investigators in education and research projects. Hehn is recognized as a national advocate for science, science policy, and science education.

The AIP Andrew Gemant Award was given to David E. Kaplan. He discovers possible theoretical extensions to the standard model of particle physics and cosmology, and then novel ways to discover those and other models. Kaplan is a Fellow of the APS, and has been named an Outstanding Junior Investigator by the DOE, a Kavli Frontiers Fellow of the NAS and an Alfred P. Sloan Fellow. He has also created and produced the documentary film, “Particle Fever,” for which he has won a DuPont Journalism Award, and other accolades.

The meeting concluded with the Presidential Transfer where Gordon P. Ramsey turned the Presidential Gavel over to incoming president, Mel Sabella.



National Meetings



SUMMER MEETING

July 20–24, Provo, UT

Statistics:

There were 1,082 attendees, 29 exhibitors, 95 sessions, 46 workshops, 5 topical discussions, and 2 poster topics.

Program Committee Chair

Chandralekh Singh

Paper Sorters:

Ramesh Adhikari
Ernest Behringer
Trina Cannon
Tom Carter
Shahida Dar,
Danny Doucette
Larry Engelhardt
Tra Huynh
Benjamin Jenkins
Blake Laing
Sissi Li
Deborah F. Lynn
Jan Mader
Alex Maries
Chris Nakamura
Chris Porter
Nathan Powers
AJ Richard
Toni Sauncy
David Sturm
Beverley Taylor
David Waters
John Welch
Dina Zohrab

Local organizers:

Bill Briscoe, Leah Kochenderfer, and Samantha Lumpkin, Brigham Young University (BYU)

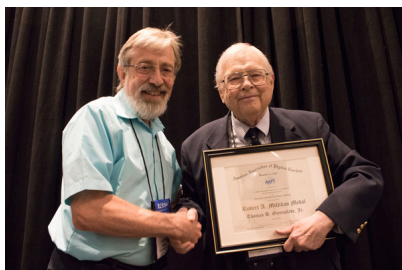
Workshop Organizers:

Brandi Pacchiega (UVA) Phil Matheson (UVA) Harold Stokes (BYU) Nathan Powers (BYU)

Plenaries

The Klopsteg Memorial Lecture Award was given to Jody A. Cooley, Southern Methodist University (SMU), Dallas, TX. Jodi Cooley received the Klopsteg Memorial Lecture Award. Her talk was *Fantastical Dark Matter and Where to Find*. It discussed the history of dark matter research and how scientists are trying to uncover the properties of this evasive matter. Only a small fraction of the universe is made from ordinary, visible matter. A much larger portion remains dark, its existence known to us only by its interactions through gravity.

The first evidence of this dark matter originates from studies of celestial bodies in the late 1920s and early 1930s. Since that time, astrophysicists and astronomers have determined that it constitutes the bulk of matter in our universe. Despite this fact, the composition still remains unknown.



Thomas A. Greenslade Jr., emeritus professor of physics at Kenyon College, Gambier, OH, received the 2019 Robert A. Millikan Medal for his notable and creative contributions to the teaching of physics. His talk, *Adventures with Oscillations and Waves*, informed attendees about Robert A. Millikan and the apparatus that he designed for the introductory physics courses at the University of Chicago at the turn of the twentieth century. He then shared how an interest in oscillations and waves sparked his interest and kept him going in the required first year physics course at Amherst College in the mid-1950s. After arriving at Kenyon College in 1964, as the youngest faculty member at the College, he discovered a “back room” full of delightful physics apparatus from the nineteenth century, and learned how to use them in demonstrations of oscillatory phenomena. Later he was able to start a new course for sophomore physics majors called “Oscillations and Waves” that made full use of Tony French’s text with a similar title. Here he was able to devise a full set of experiments, some old and some that he developed. As we saw, there is more than one way to swing a pendulum!

Claire Gmachl received the PhD degree (sub auspiciis praesidentis) in electrical engineering from the Technical University of Vienna, Austria, in 1995. In 1996, she joined Bell Laboratories, Lucent Technologies, Murray Hill, NJ, to work on Quantum Cascade lasers and microcavity devices. Mid-Infrared Quantum Cascade Lasers and Applications, she explained that Quantum Cascade (QC) lasers are a rapidly evolving mid-infrared and THz semiconductor laser technology based on intersubband transitions in multiple coupled quantum wells. The lasers’ strengths are their wavelength tailorability, high performance and fascinating design potential. They find primarily application in trace-chemical sensing for applications in environment and health. She first gave a brief introduction into QC lasers followed by a discussion of several recent highlights, such as the quest for high performance QC lasers and the implementation of unconventional laser schemes and new materials for intersubband devices. She also briefly touched on several applications, such as field campaigns of QC laser-based sensing, and her recent work in non-invasive in vivo glucose sensing. The work presented was conducted in collaboration with many valued colleagues in our own research group and across MIRTHE.

The APS Plenary, co-sponsored by the American Physical Society Forum on Education, featured



National Meetings continued

Pearl Sandick from the University of Utah. In her talk, WIMPs in the Sky, Sandick noted that The question of the identity of dark matter is one of the most important outstanding puzzles in modern physics. Of the many potential explanations proposed, perhaps the most-studied is a new species of elementary particles called Weakly Interacting Massive Particles (WIMPs). The properties of dark matter are being probed in a variety of ways, for example by terrestrial experiments buried deep underground as well as satellite experiments looking for signals from space. She discussed the prospects for “discovering” dark matter, focusing on the indirect detection technique, and how WIMPs may reveal themselves via signatures of their annihilation or decay in and around our Galaxy.



The other invited APS plenary speaker was Jack Burns, University of Colorado. Burns is director of the Network for Exploration and Space Science, a \$3.6 million center of excellence funded by the NASA Solar System Exploration Research Virtual Institute. His talk, Hydrogen Cosmology: Observing the Dark Ages of the Universe from the Farside of the Moon, covered Cosmic Microwave Background photons decoupled from baryons, the Dark Ages epoch, eventually collapsing into the first stars and galaxies during the subsequent Cosmic Dawn and up to the Epoch of Reionization. He described the results of a NASA-funded concept study for the Dark Ages Polarimeter Pathfinder (DAPPER), operating in a low lunar orbit above the radio-quiet farside. DAPPER will use the Dark Ages trough to investigate divergences from the standard model and new physics such as heating or cooling produced by dark matter.

DAPPER's science instrument consists of dual orthogonal dipole antennas and a tone-injection spectrometer/ polarimeter based on high heritage components from the Parker Solar Probe/FIELDS, THEMIS, and the Van Allen Probes. DAPPER will be deployed from the vicinity of NASA's Lunar Gateway and transfer to a frozen 50x125 km lunar orbit using a deep space spacecraft bus which has both high impulse and high delta-V. This orbit will facilitate the collection of radio-quiet data over a 26 month lifetime for the mission.

Laura Greene, physics professor at Florida State University and Chief Scientist at the National High Magnetic Field Laboratory, is noted for her research on Andreev bound states and is an expert in strongly correlated Fermionic systems. Her talk was on Dark Energy of Quantum Materials. During the discoveries of the first high transition temperature (Hi-Tc) superconductors she and collaborators from AT&T laboratories, were amongst the first to report on the role of oxygen and crystal structure in the copper-oxides. Laura Greene is a champion for diversity and is active in promoting equal rights for women and minorities. She is a member of the Department of State supported COACH team, an organization for assisting in the success and impact of women scientists and engineers.



Highlights

Nearly 1100 physics educators came together in the land of towering mountains and blue skies to participate in the 2019 Summer Meeting. With this meeting being held in Provo, Utah attendees recognized that the place where they were assembled is traditional Native American land during a ceremony at the Welcome reception. They were able to participate in a “Days of ‘47” rodeo and enjoy other celebrations relating the the anniversary of the first pioneers in Utah along with a full week of physics education.

Physics Education Researchers participated in the post-meeting PER Conference, Physics Outside of the Classroom: Teaching, Learning, and Cultural Engagement in Informal Physics Environments (<https://www.compadre.org/per/conferences/2019/>).

The AAPT Fun Run/Walk continues to be a popular event providing a break from the intense learning format of the meeting and the Speed Networking event, providing an opportunity for new physics educators to interact “one on one” with seasoned professionals, continued to grow. Much anticipated features of the Summer Meeting, The High School Physics Photo Contest and the Apparatus Competition, are always highlights and this year the entries were exceptional.



David Jackson received 2019 Halliday Resnick Award The Halliday and Resnick Award for Excellence in Under Graduate Physics Teaching was presented to David Jackson from Dickinson College, Carlisle, PA. His talk, Helping Students Have Meaningful Learning Experiences in Physics, focused on the best way to help students learn.

Over the past several decades, a significant amount of research has gone into trying to answer this question. Two lessons that have come out of this research are: (i) that lectures are much less effective than any of us would like to believe, and (ii) that getting students actively engaged in the material is essential for effective learning. Ultimately, he noted that the best we can do is to try to provide meaningful hands-on experiences to our students, and then guide them through the steps needed to develop an understanding of the situation. In this talk, he gave several examples of such experiences.

SM19 Dodge Citations and Fellows The Summer 2019 recipients of the Homer L. Dodge Citations for Distinguished Service to AAPT were Geraldine Cochran, Larry Engelhardt, Laura E. McCullough, and Brian Pyper. 2019 AAPT Fellows, David M. Cook and Deborah Dawn Mason-McCaffrey were also recognized.



AAPT invited attending members to participate in the President's Town Hall and work with the Board of Directors to enact the new Strategic Plan. During the next few years we have decided to focus on the following subset of strategies:

- Develop programs, products, and services that meet the needs, build on the strengths, and pique the interest of physics educators throughout their careers.

- Provide and support professional development for physics educators and physics education researchers locally, regionally, nationally, and internationally.

- Develop, improve, and support programs to increase the number of physics students and retain these students in our physics classes, at all levels and from all academic, socio-economic, and cultural backgrounds.

- Develop, improve, and support efforts to recruit and provide professional development for educators of underrepresented and marginalized students in physics.

One way to tie these synergistic strategies is to work toward addressing AAPT's priority of supporting equity, diversity, and inclusion in physics through the development of programs, products, and services for students and teachers at all levels.



Special events began Sunday with the opening of the High School Physics Photo Contest, the evening Exhibit Hall Opening Reception and SPS Undergraduate Research Poster session. Monday was the High School Teachers' Day and Two-Year College Day, and the schedule was packed with events and sessions of particular interest to high school teachers. Also on Monday were the First Timers Gathering, LGBTQ Meet-Up, the Apparatus Competition, the Early Career Professionals Speed Networking event, Game Night, and Einstein: Celebrating 100 Years and Accessibility/disability meetup.



PHYSICS EDUCATION RESEARCH (PER)

PER Conference 2019—Provo, Utah

July 24-25,

“Physics Outside of the Classroom: Teaching, Learning, and Cultural Engagement in Informal Physics Environments.”

(390 attendees)

PER LEADERSHIP ORGANIZING COUNCIL

Vashti A. Sawtelle, Co-Chair

Chandra Anne Turpen, Co-Chair

Geoff Potvin, Vice Chair /Treasurer

Gina Passante ,Ex-officio/RiPE Chair

Ed Price

Hannah C. Sabo ,PERTG MiniGrants, PERTCoGS Rep

Erin M. Scanlon ,PERC

Stamatis Vokos ,PERTG MiniGrants

PERC ORGANIZING COMMITTEE

Mike Bennett, University of Colorado

Jackie Chini, University of Central Florida

Claudia Fracchiolla, University College Dublin

Danielle Harlow, University of California,

Katie Hinko, Michigan State University

Katemari Rosa, Teachers College

Plenary Sessions:

Informal STEM Learning and Science Communication: An Expanding Landscape of Resources, Research, and Collaborators, James R. Bell, Center for Advancement of Informal Science Education

A Collective Exploration of Physics Beyond the Classroom, Shane Bergin, University College Dublin, Ireland

Making through a lens of culture, power, & equity: Visions for Learning and Teaching in Informal Settings, Paula Hooper, Northwestern University

PERC 2019, provided opportunities in both traditional and non-traditional ways to connect and socialize with other physicists, as well as with the local community, and provided opportunities to showcase the rigorous research being done in informal and formal fields with connections to outreach. Physics education occurs in a multitude of contexts: in the home, afterschool, in museums, in the community, online, and in classrooms. Thus, as a complement to formal physics education, informal physics provides novel contexts for researching physics learning and instruction, pathways to physics identity, and other topics. Informal physics education research provides opportunities to consider the ways in which physics as a culture presents itself to the public, including to potential future physicists, especially those from under-represented groups. In a broader context, informal physics is the gateway through which physicists communicate with the public, making physics part of society in the process.

PHYSICS TEACHER RESOURCE AGENTS (AAPT/PTRA) PROGRAM



Read more online at: www.aapt.org/PTRA

Workshops were held during the AAPT 2019 Summer Institute in Capitol Reef National Park, Utah and focused on astronomy.

AAPT maintains a nationwide cadre of more than 150 accomplished high school teacher-leaders who are trained and continually involved in professional development. These teacher-leaders are certified as PTRAs by AAPT to lead workshops throughout the country.



2019 PTRA COMMITTEE

Karen Jo Matsler, Program Director

OVERSIGHT COMMITTEE

Jill Marshall, Chair, Christopher J. Chiaverina, Kenric Davies, Janie Head, Tommi Holsenbeck, Bob Powell, Ann Robinson, Beth A. Cunningham, Ex Officio, Karen Jo Matsler, Ex Officio, Mark S. Hannum,, Ex Officio

Workshops and Programs

WORKSHOP FOR NEW PHYSICS AND ASTRONOMY FACULTY

*June 24-27, 2019 and
November 14-15, 2019*

AAPT, in conjunction with the American Astronomical Society (AAS) and the American Physical Society (APS), held two workshops for new physics and astronomy faculty members at the American Center for Physics. These workshops helped 170 new faculty understand how students learn physics and astronomy, and suggested how this information can impact a new professor's teaching methods. The workshop is intended for faculty in the first few years of their initial tenure-track appointment at a four-year college or university.

Department chairs at research and four-year institutions are asked to nominate tenure-track faculty. The ideal candidate would have a year or two of teaching experience and be aware of the challenges of teaching.

The New Physics and Astronomy Workshop program was funded by grants # DUE-0813481, DUE-0121384, and DUE-9554738 from the National Science Foundation. Read more online at: www.aapt.org/Conferences/newfaculty/



PARTNERSHIP FOR INTEGRATION OF COMPUTERS INTO UNDERGRADUATE PHYSICS



About PICUP

Vision: Computation is an integrallpart of the education of every undergraduate physics student

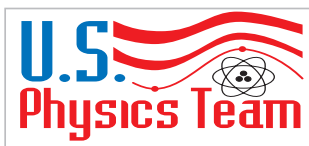
Mission: Create a vibrant community or educators, a forum for open discussion, a collection of educational resources, and a set of strategies and tactics that support the development and improvement of undergraduate physics education through integration of computation across its curriculum.

Approach: Our approach to this mission is to increase the organic use of computation in all individual courses. We realize that computation, in addition to analytic theory and experiment, is essential for the physicist of the twenty-first century. Computing must play a vital role in physics education. We aim to increase the use of computation in physics courses through the development of computational packages that are closely tied to the subject matter of popular physics texts, and through lowering the barriers to the adoption, and more importantly, adaptation of educational materials so that the integration of computation into physic courses is effectively facilitated for all physics faculty

Organization: Our informal organization created by two retired physicists - Norman Chonacky and David Winch - having broad experience in undergraduate education, applied physics research, and engineering development. We have conducate research into the integration of computational physics in undergraduate invironments and recruited tot he partnership a collection of physics instructors representative of the national diversity of institutional types and departmental environments all bound by interest in and commitment to the integration of computation into undergraduate courses as a third method of modeling, investigating,, and understanding the physics world.

Leadership Council: Danny Caballero, Michigan State University, Norman Chonacky, Yale University, Larry Engelhardt, Francis Marion University, Robert Hilborn, American Association of Physics Teachers, Marie Lopez del Puerto, University of St. Thomas, Kelly Roos, Bradley University.

2019 UNITED STATES PHYSICS TEAM



Read more at: www.aapt.org/physicsteam/2019

The 50th International Physics Olympiad that was held July 7 –15, 2019 in Tel Aviv, Israel. The nine day competition among 70 of the world's top high school physics students from 78 nations consisted of an Experimental Exam and a Theoretical Exam. The team also experienced several cultural outings and visits.

The participants representing the 2019 U.S. Physics Team were:

- Vincent Bian, Poolesville High School, Poolesville, MD Gold medal, ranked 6th overall
- Sean Chen, Canyon Crest Academy, San Diego, CA Gold medal
- Edward Lu, Cinco Ranch High School, Katy, TX Silver medal
- Albert Qin, Mira Loma High School, Sacramento, CA Silver medal
- Sanjay Raman, Lakeside School, Seattle, WA Silver medal



The traveling team, from left to right, Jiajia Dong (Academic Director), Edward Lu, Sanjay Raman, Albert Qin, Sean Chen, Vincent Bain, Mark Eichenlaub (coach)

DIRECTOR

Jiajia Dong, Bcknell College

ACADEMIC COACHES

The U.S. Team was led by JiaJia Dong of Bucknell University and Mark Eichenlaub from University of Maryland..

PHYSICS BOWL SPONSORS

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Educational Innovations, Inc.
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PASCO Scientific
Princeton University Press
Turner Publishing Company
Vernier Software & Technology
WebAssign

PHYSICSBOWL

AAPT PHYSICS BOWL

This year there were almost 7100 students participating from 307 schools from Australia, Canada, Costa Rica, Guam, Hong Kong, Indonesia, the Republic of Korea, the Netherlands, the Philippines, Serbia, Singapore, Switzerland, Turkey, the United Kingdom, and the United States, as well as 341 schools participating from China.

2019 TOP 10 GLOBAL WINNERS

| # | SCORE | STUDENT, SCHOOL, CITY, STATE |
|----|-------|--|
| 1 | 39 | Chris Lee Olympiad Academia NY |
| 2 | 39 | Alvin Peng Gauss School of Math and Science NJ |
| 3 | 39 | Jeffrey Xu Saratoga High School CA |
| 4 | 39 | Ethan Hu Marc Garneau C.I. ON |
| 5 | 39 | Milan Ganai Lynbrook HS CA |
| 6 | 38 | Vedantha Venkatapathy Bellevue College North Campus WA |
| 7 | 38 | Zhi Yang Chen Victoria Park Collegiate Institute ON |
| 8 | 38 | Adith Sundram Gauss School of Math and Science NJ |
| 9 | 38 | Vincent Xu Darien High School CT |
| 10 | s37 | Henry Guo Ay Jackson Secondary School ON |

PHYSICSBOWL ADVISORY BOARD

Jon Anderson, Myra West, Michael Bush, Beverly Trina Cannon, Scott Dudley, Sean Flaherty, Thomas Herring, Joel Klammer, Andrzej Sokolowski, Eric Stron, and Courtney Willis

2019 High School Physics Photo Contest

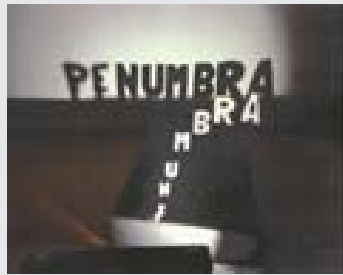
The High School Physics Photo Contest is open to high school students in grades 9-12 (or equivalent international grade level). Photos may be entered in one of the categories described below, and are judged on the quality of the photo and the accuracy of the physics in the explanation that accompanies the photograph. Out of over 700 submissions, the 100 finalist photos were selected, displayed, and judged during the 2019 Summer Meeting.

See www.aapt.org/Programs/contests/winners.cfm?theyear=2019 for information on the following overall winners of 2019.

high school physics
photo contest

Contrived photos are those that are set up to show a particular physics concept or related set of concepts. Contrived photos represent non-spontaneous events.

FIRST



SECOND

THIRD



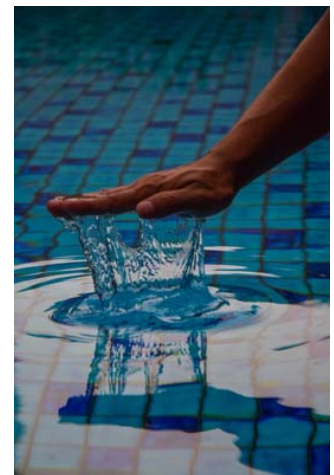
Natural photos are those that involve everyday situations that may demonstrate a variety of physics concepts. Any spontaneous event is considered natural.

FIRST



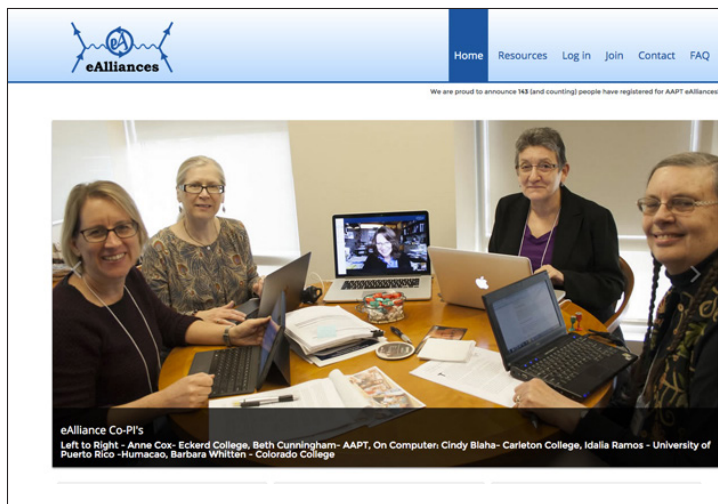
SECOND

THIRD



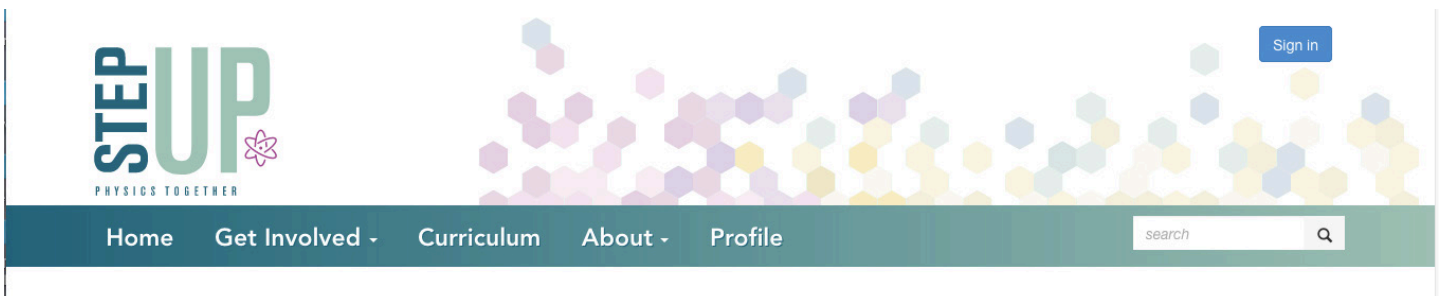
Collaborative Projects

eAlliances: Uniting Isolated Women Physicists and Astronomers



Everyone needs mentors, but how do you find other women physicists who understand your experience-- as the only Hispanic in the department, the only PER researcher, the only full-time physicist at your TYC, the only one who brings a newborn in a sling to department meetings?

This is professional development for your career stage: whether you are teaching your first or hundredth section of intro physics; mentoring your first or hundredth research associate, or leading your first or hundredth committee meeting. frustrations, and successes.



Women in Physics

Learn more about our Women in Physics Lesson!

Additional teacher preparation: Read the [Women in Physics International Factsheet](#) before implementing the lesson. Teachers who have previously done this lesson felt more comfortable having more information for themselves beforehand.

While we encourage usage of the tools below, they are tailored for a classroom environment. The STEP UP community wrote [recommendations for remote teaching the Women in Physics lesson!](#) Our Online Community also has a [guide to our beta-version of the Women in Physics supplemental site](#).

Support for this lesson

Get Involved

- Ambassadors
- Support
- Student outreach

Curriculum

- Lesson materials

About

- Program overview
- Resources
- Project leadership
- Contact
- Donate
- Frequently asked questions
- Research and publications

Careers in Physics

Learn more about our Careers in Physics Lesson!

While we encourage usage of the tools below, they are tailored for a classroom environment. STEP UP rolled out a set of recommendations for [remote teaching the Careers in Physics lesson](#) and [posted them](#) [here](#) on the Online Community (Need help logging in? See [here](#)). We also have a [guide to our beta-version of the Careers in Physics supplemental site](#).

Support for this lesson

Get Involved

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Collaborative Projects (cont.)

PHYSTEC TEACHER OF THE YEAR

The PhysTEC Teacher of the Year program aims to recognize outstanding high school physics teachers and to demonstrate the impact and value of physics teacher preparation programs as members of PhysTEC. PhysTEC recognizes up to one local Teacher of the Year per PhysTEC institution and a single national Teacher of the Year. Awardees recognized by PhysTEC are points of pride for the physics teaching community.

Matthew Blackman of Ridge High School in Basking Ridge, New Jersey was named the 2019 PhysTEC National Teacher of the Year. The selection committee noted his efforts to dramatically increase AP Physics enrollment and scores over his 10 years of teaching the subject. Specifically, he worked to improve the percentage of female students taking AP Physics, increasing it from under 20% to over 50%.

Outside of Ridge High School, Blackman teaches graduate courses in the Physics Education master's program at Rutgers University (of which he is an alumnus). He also launched a successful professional development summer workshop for physics teachers, which has grown from eight participants to over 20 per year. In his spare time, Blackman is a self-taught coder and designer of video games; he has built five educational physics games to help students explore the concepts of kinematics, circuits, waves, and electrostatics. His 501c3 nonprofit, Universe and More, develops and distributes the games, which are free-of-charge to play (and always will be). The games have received millions of plays, and are used by teachers in all 50 states and over 60 countries.

Recently, Blackman was recognized by the New Jersey Senate with a Congressional Resolution honoring his achievements in the classroom, including the creation of educational games and coaching FIRST robotics.



2019 PHYSTEC CONFERENCE

The 2019 Physics Teacher Education Coalition Conference, March 2-3 was held in Boston, Massachusetts at the Westin Boston Waterfront Hotel. The meeting included a presentation on the new Thriving Physics Teacher Education Programs report, which identifies common practices and structures of highly successful programs so that these approaches may be emulated by other physics teacher education programs, along with much more. It featured workshops on best practices, panel discussions by national leaders as well as excellent networking opportunities for physics teacher educators. A post-conference workshop, Get the Facts Out: Changing the Conversation Around STEM Teacher Recruitment, was offered March 3. This workshop is designed to address some of the common misperceptions discouraging promising students from exploring and pursuing a career in STEM education. Dr. Wendy Adams, Colorado School of Mines, spoke on the major concerns voiced by students and presented the realities of the many benefits to a career as a STEM teacher.

March 2

Plenary, What do Thriving Physics Teacher Education Programs Do? Insights from the Physics Teacher Education Program Analysis (PTEPA) Rubric, Stephanie Chasteen, Chasteen Educational Consulting

Workshops: Making the Case for Preparing STEM Teachers, Michael Marder; Lessons from International Physics Teacher Education Systems; Chair: Stamatis Vokos, Panelists: James de Winter, Gorazd Planinsic, Bor Gregorcic; Preparing Teachers for AP Physics, Chair: Matthew Perkins Coppola, Panelists: Andrew Duffy, Mark Greenman, Gay Stewart; Cultivating Relationships with Schools of Education, Chair: Shari Weaver, Panelists: Chuhee Kwon, Gay Stewart, Stamatis Vokos; Have yourself a PTEPA Party! Use and Interpretation of the PTEPA Rubric., Stephanie Chasteen, David May; STEP UP 4 Women: Supporting Teachers to Encourage the Pursuit of Undergraduate Physics for Women, Robynne Lock

March 3

Plenary, Rebranding Teaching, Zachary Levine, TEACH

Plenary, Sports on the Moon, Arthur Eisenkraft, University of Massachusetts - Boston

Workshop: How to be Political: Overcoming Barriers, Securing Resources, Ted Hodapp; Microteaching as one of the ways to develop productive teaching habits, Eugenia Etkina; Share-a-thon, Vince Kuo; LA Campus Software for Managing and Growing Your LA Program, Valerie Otero, Manher Jariwala; Innovations in Physics Teacher Training, Chair: Eric Rowley, Panelists: Nick Gross, Will Newton, Jordan Gerton; Induction Support and Teacher Community Chair: John Stewart Panelists: Eugenia Etkina, Duane Merrell, Katey Shirey.

2019 Awards and Grants

HANS CHRISTIAN OERSTED MEDAL

Gay Stewart, Eberly Professor of STEM Education and director of the West Virginia University Center for Excellence in STEM Education
A spectacular Opportunity for the Physics Community to Broaden its Community of Learners



ESTABLISHED IN 1936, THE OERSTED MEDAL HONORS THE DANISH PHYSICIST HANS CHRISTIAN OERSTED (1777-1851). THIS PRETIGIOUS AWARD IS PRESENTED ANNUALLY TO A PERSON WHO HAS HAD OUTSTANDING, WIDESPREAD, AND LASTING IMPACT ON THE TEACHING OF PHYSICS.

Gay Stewart was the 2019 recipient of the prestigious Hans Christian Oersted Medal, presented by the American Association of Physics Teachers (AAPT). The Oersted Medal recognizes her outstanding, widespread, and lasting impact on the teaching of physics through her pioneering national leadership in physics education, her exceptional service to AAPT, and her mentoring of students and in-service teachers.

Stewart has received recognition from both the physics research and physics education communities for her work in physics teacher preparation and physics education policy generally. At the University of Arkansas Stewart co-directed one of the first PhysTEC (Physics Teacher Education Coalition) supported sites and oversaw a remarkable rise in the number of certified physics teachers graduating from that institution. She also led the charge to replicate the UTeach program at Arkansas, and continued the replication effort as she moved to West Virginia University. She is the only person to co-direct UTeach sites at more than one institution.

In addition to millions of dollars in NSF- and HHMI-supported grant funding for physics education research, curriculum, and program development, she has been the PI or Co-PI for several NSF-supported Noyce Scholarship grants for future teachers.

Perhaps the most widespread influence Stewart has had on the physics education community has been in the development of high school physics curriculum and curriculum standards. Her stamp is clearly visible in the AP Physics redesign, an effort she co-chaired. She also participated in the effort to inform the writing of the Next Generation Science Standards on behalf of the physics community.

The full press release is available at <https://www.aapt.org/aboutaapt/Gay-Stewart-to-Receive-AAPT-2019-Oersted-Medal.cfm>

2019 Melba Newell Phillips Medal Awarded to Jack G. Hehn

Jack G. Hehn, AAPT Senior Fellow, College Park, MD
May the Work I Have Done Speak for Me



The Melba Newell Phillips Medal was awarded to Jack G. Hehn, AAPT Senior Fellow, College Park, MD, in recognition of his creative leadership and dedicated service that have resulted in exceptional contributions within AAPT.

Hehn has a wide range of experience in physics and science education having taught and worked with students in elementary school through graduate school.

He has served in administrative staff and instructional roles within physics departments for 19 years and has spent much time developing and teaching the freshman physical science course for pre-service teachers, developing mentoring and training programs for teaching assistants, and developing instructional laboratory programs using multimedia and interactive computer technologies.

In 1992, Hehn joined the American Association of Physics Teachers (AAPT) as the Associate Executive Officer. Two of the efforts he helped to direct included a high school textbook, "Active Physics," and a college physical science course for pre-service teachers, "Powerful Ideas in Physical Science." He was also active in the effort to create national science standards and in the development of a large-scale networking project for two-year colleges, TYC21. He worked in support of earth systems education efforts; and encouraged and supported the development of a physics digital library for educational resources, CompADRE. He also served on the National Task Force on Undergraduate Physics and has been involved with the Physics New Faculty Workshop.

The full press release is available at https://www.aapt.org/aboutaapt/Jack-G-Hehn_2019-Melba-Newell-Phillips-Medal.cfm

THE MELBA NEWELL PHILLIPS MEDAL IS PRESENTED TO AAPT LEADERS WHO, LIKE MELBA NEWELL PHILLIPS AFTER WHOM THE MEDAL IS NAMED, HAVE PROVIDED CREATIVE LEADERSHIP AND DEDICATED SERVICE THAT RESULTED IN EXCEPTIONAL CONTRIBUTIONS TO AAPT. THE RECIPIENT, WHO MUST BE AN AAPT MEMBER, DELIVERS AN ADDRESS AT THE AAPT MEETING AT WHICH THE MEDAL IS PRESENTED AND RECEIVES A MONETARY AWARD, THE MELBA NEWELL PHILLIPS MEDAL, AN AWARD CERTIFICATE, AND TRAVEL EXPENSES TO THE MEETING. THE MEDAL IS PRESENTED ONLY OCCASIONALLY. SELF-NOMINATION IS NOT APPROPRIATE FOR THIS AWARD.

2019 Awards and Grants (cont.)

THE DAVID HALLIDAY AND ROBERT RESNICK AWARD FOR EXCELLENCE IN UNDERGRADUATE PHYSICS TEACHING

David Jackson, Dickinson College, Carlisle, Pennsylvania

Helping Students Have a Meaningful Learning Experience in Physics

David Jackson received the 2019 David Halliday and Robert Resnick Award for Excellence in Undergraduate Physics Teaching.

Jackson is Associate Professor of Physics, Dickinson College in Carlisle, Pennsylvania. A member of AAPT since 1994, he served as Editor of the American Journal of Physics (AJP) from September 2011 through August 2017, and currently serves as Video Abstracts Editor for the journal. His role as editor included service on the AAPT Board of Directors and the Publications Committee. From 2001 through 2004 he was a member of the AAPT Committee on Science Education for the Public.

Jackson's undergraduate work in Physics at the University of Washington was recognized as Magna Cum Laude with distinction in Physics. After receiving his Ph.D. in physics from Princeton University in 1994, he has held faculty positions at Santa Clara University and Dickinson College, including a term as Chair of the Dickinson Department of Physics and Astronomy from 2006-2009.

Jackson played a pivotal role, together with Priscilla Laws and Scott Franklin, in developing the Explorations in Physics course materials at Dickinson. His leadership and pedagogical insight combined in this endeavor to produce a vibrant course for non-majors that emphasizes exploration, inquiry, and the process of doing science while conveying to students that physics is fun. His efforts also resulted in a book published by Wiley and, most recently, in an article that appeared in Science.

Read the full press release at: aapt.org/aboutaapt/David-Jackson-2019-Halliday-and-Resnick-Award.cfm



ESTABLISHED IN 1993 AND NOW NAMED FOR THE AUTHORS OF A VERY SUCCESSFUL COLLEGE-LEVEL TEXTBOOK ON INTRODUCTORY PHYSICS AND FUNDED SINCE 2010 PRIMARILY BY A GENEROUS ENDOWMENT FROM JOHN WILEY AND SONS, THE PUBLISHER OF THAT TEXTBOOK, THE DAVID HALLIDAY AND ROBERT RESNICK AWARD FOR EXCELLENCE IN UNDERGRADUATE PHYSICS TEACHING RECOGNIZES OUTSTANDING ACHIEVEMENT IN TEACHING UNDERGRADUATE PHYSICS, WHICH MAY INCLUDE THE USE OF INNOVATIVE TEACHING METHODS.

KLOPSTEG MEMORIAL LECTURE AWARD

Jodi A. Cooley, Southern Methodist University Dedman College of Humanities and Sciences

Fantastical Dark Matter and Where to Find It

Jodi A. Cooley, Southern Methodist University (SMU), Dallas, TX, was the 2019 recipient of the Klopsteg Memorial Lecture Award. Cooley is an Associate Professor of experimental particle physics in the SMU Dedman College of Humanities and Sciences. She received a B.S. degree in Applied Mathematics and Physics from the University of Wisconsin in Milwaukee in 1997. She earned her Masters in 2000 and her Ph.D. in 2003 at the University of Wisconsin - Madison for her research searching for neutrinos from diffuse astronomical sources with the AMANDA-II detector. Upon graduation she did postdoctoral studies at both MIT and Stanford University.

Her career includes many interviews, publications, conference presentations, and talks, including a 2018 Science Friday interview, Dark Matter Eludes Particle Physicists. Cooley is a principal investigator on the Super Cryogenic Dark Matter Search in the Soudan Underground Laboratory in Minnesota; the SNOLAB in Sudbury Canada; and the Assays and Acquisition of Radio-pure Materials Collaboration, whose aim was to develop integrative tools for underground science.

She has won numerous awards for her research, teaching, and mentoring, including an Early Career Award from the National Science Foundation and the Ralph E. Powe Junior Faculty Enhancement Award from the Oak Ridge Associated Universities. In 2018 she was elected a fellow of the American Association for the Advancement of Science (AAAS) for her contributions to the search for dark matter scattering with nuclei, particularly using cryogenic technologies.

Read the full press release at: aapt.org/aboutaapt/Jodi-A-Cooley-Named-as-Recipient-of-the-2019-Klopsteg-Memorial-Lecture-Award.cfm



THE KLOPSTEG MEMORIAL LECTURE AWARD IS NAMED FOR PAUL E. KLOPSTEG, A PRINCIPAL FOUNDER, A FORMER AAPT PRESIDENT, AND A LONG-TIME MEMBER OF AAPT, AND RECOGNIZES OUTSTANDING COMMUNICATION OF THE EXCITEMENT OF CONTEMPRARY PHYSICS TO THE GENERAL PUBLIC. THE RECIPIENT DELIVERS THE KLOPSTEG LECTURE AT AN AAPT SUMMER MEETING ON A TOPIC OF CURRENT SIGNIFICANCE AND AT A LEVEL SUITABLE FOR A NON-SPECIALIST AUDIENCE AND RECEIVES A MONETARY AWARD, AN AWARD CERTIFICATE, AND TRAVEL EXPENSES TO THE MEETING.

2019 Awards and Grants (cont.)

THE ROBERT A. MILLIKAN MEDAL, ESTABLISHED IN 1962, RECOGNIZES TEACHERS WHO HAVE MADE NOTABLE AND CREATIVE CONTRIBUTIONS TO THE TEACHING OF PHYSICS.



ROBERT A. MILLIKAN MEDAL

Tom Greenslade, Kenyon College, Gambier, Ohio
Adventures with Oscillations and Waves?

Tom Greenslade was the Robert A. Millikan Medal awardee for 2019. Greenslade is a Professor Emeritus of Physics at Kenyon College.

He received his A.B. in 1959 in physics from Amherst College and his doctorate in experimental low temperature physics from Rutgers University in 1965. From 1964 to 2005 he was a member of the Kenyon College physics faculty. When he retired, Kenyon awarded him a D.Sc. A member of the American Association of Physics Teachers since 1959, Greenslade was recognized with the association's Distinguished Service Citation and in 1987. He was listed as one of the 75 most influential physicists and physics teachers by the American Association of Physics Teachers. He won first prize in the Association's Apparatus Competition in 2007. In 2014 AAPT recognized his life-time of contributions by making him a Fellow of the American Association of Physics Teachers. He is also a fellow the American Physical Society.

Greenslade has been generous in sharing his vast knowledge and expertise with the broader physics community in a variety of other ways. He maintains a website, "Instruments for Natural Philosophy" that includes some 1850 pictures of early physics apparatus along with descriptions and references, and he answers many queries from historians and collectors. His collection of about 775 pieces of physics teaching apparatus from the 1850-1950 era is housed in a wing of his 1857 house in Gambier. Visitors range from children to professors of physics; make an appointment and visit. His large collection of old, primarily 19th century, textbooks and early equipment catalogs preserve original descriptions of historically important laboratory and demonstration apparatus.

Read the full press release at: aapt.org/aboutaapt/2019-Millikan-Medal-Awarded-to-Tom-Greenslade.cfm

AAPT 2019 Fellows Award

The criterion for selection of Fellows is exceptional contribution to AAPT's mission, to enhance the understanding and appreciation of physics through teaching. Fellowship is a distinct honor signifying recognition by one's professional peers. Any AAPT member who has maintained an active membership for at least 7 years is eligible for nomination for Fellowship. Nominations are evaluated by the AAPT Awards committee and approved by the AAPT Board of Directors.

The 2019 recipients of the AAPT Fellows Award were:

David M. Cook, Lawrence University, Appleton, Wisconsin
Deborah Dawn Mason-McCaffrey, Salem State University, Salem, Massachusetts

2019 Awards and Grants (cont.)

HOMER L. DODGE CITATIONS
RECOGNIZE AAPT MEMBERS
FOR THEIR EXCEPTIONAL
CONTRIBUTIONS TO THE
ASSOCIATION AT THE NATIONAL,
SECTIONAL, OR LOCAL LEVEL.

HOMER L. DODGE CITATIONS FOR DISTINGUISHED SERVICE TO AAPT

Winter Meeting 2019



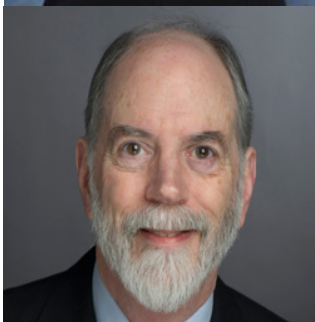
Janelle M. Bailey's long history of dedicated service to the organization began many years prior to entering the four-year AAPT Presidential Chain in 2014 and included: Co-Founder, President, and Section Representative, Southern Nevada Section; Editorial Board Member and occasional reviewer, *The Physics Teacher*; reviewer, *American Journal of Physics*; Chair and Committee member, Committee on Space Science and Astronomy; Organizer/presider of multiple sessions and workshops; and Paper Sorter for WM07 (Joint Meeting with the American Astronomical Society) and WM12. In 2014 she was elected to serve as Vice President on the AAPT Executive Board and continued serving as President-Elect in 2015, President in 2016, and Past President in 2017.. <https://www.aapt.org/aboutaapt/2019-Homer-L-Dodge-Citation-for-Distinguished-Service-to-AAPT-to-be-Awarded-to-Janelle-M-Bailey.cfm>



Heather Lewandowski is an Associate Professor, Associate Chair and Director of the Engineering Physics Program, at the Physics Department at the University of Colorado at Boulder, and a Fellow at JILA. Her dual research areas are in fundamental experimental molecular physics as well as Physics Education Reserach. Lewandowski has been an active member of AAPT since 2007 and has also been an active member of ALPhA, serving on their board since 2011. She has served on the Committee on Laboratories and was in that capacity when she also served as a member of the sub-committee that drafted the "Recommendations for the Undergraduate Physics Laboratory Curriculum" endorsed by the AAPT Executive Board in 2014. Lewandowski has also served on the Programs Committee and as a member of the *American Journal of Physics* Resource Letters Editorial Board from 2014-2018. <https://www.aapt.org/aboutaapt/Heather-Lewandowski-Recognized-as-a-2019-Recipient-of-the-Dodge-Citation.cfm>



Sherry Savrda has been Professor of Physics at Seminole College since 1993. An active member of AAPT since 1993, Savrda has served on the AAPT Nominating Committee, and the Committee on Physics in Two-Year Colleges, twice as chair, prior to her election to the Board of Directors as the At Large Representative for Two-Year-Colleges where she served from 2015-2018. As a member of the Board she served on the Lotze Scholarship, Awards, and Audit Committees. She has worked tirelessly in promoting physics and physics teaching locally in Florida and nationally through her efforts in TYC21, ICP21 grant project, AAPT's New Faculty Experience for Two Year College Physics Faculty, and numerous other "projects" through or affiliated with AAPT. She has been active in the Florida Section of AAPT for over 20 years <https://www.aapt.org/aboutaapt/2019-Homer-L-Dodge-Citation-for-Distinguished-Service-to-AAPT-to-be-Awarded-to-Sherry-Savrda.cfm>.



Robert Teese is a pioneer in the use of video analysis. He initiated and directs the LivePhoto Physics project, which published a book of video-analysis activities for introductory physics courses and is currently developing Interactive Video Vignettes for physics and biology courses. This project has held frequent workshops for university and high-school teachers at AAPT meetings, including multi-day workshops. A professor in the Department of Physics at the Rochester Institute of Technology, Teese got his M.A in Experimental Physics and his Ph.D. in Theoretical Physics at the University of Texas. He has been an AAPT member since 1987, serving on the Committee on Educational Technologies, presenting at AAPT Summer and Winter Meetings, and supporting several AAPT education funds. Additionally, he served as Treasurer of the Southern Ohio Section of AAPT.r <https://www.aapt.org/aboutaapt/Robert-Teese-to-be-Honored-with-a-2019-Dodge-Citation-for-Distinguished-Service.cfm>



Aaron Titus is Professor and Chair of the Department of Physics at High Point University, High Point, North Carolina. He has been an active member of AAPT for 20 years and, besides the committees required as part of his Board of Directors role, he has served on the Lotze Scholarship, Physics in Undergraduate Education, and Graduate Education in Physics committees. He was elected and served as the Four-Year College Representative for AAPT from 2013-2016. In addition, he has been active in the North Carolina Section, presenting talks (several receiving awards) and workshops as well as hosting several Section Meetings. When he arrived at High Point University, there was no physics department and no physics major. Aaron was instrumental in creating a physics major as part of the Department of Chemistry. He was equally instrumental in the creation of a separate Department of Physics and he has served as its first and only Chair. <https://www.aapt.org/aboutaapt/Aaron-Titus-2019-Dodge-Citation.cfm>

2019 Awards and Grants (cont.)

HOMER L. DODGE CITATIONS FOR DISTINGUISHED SERVICE TO AAPT

Summer Meeting 2019

Geraldine Cochran, Assistant Professor of Professional Practice in the School of Arts and Sciences and the Department of Physics and Astronomy at Rutgers University, Cochran is a physics education researcher. She earned her Ph.D. in curriculum and instruction with a cognate in physics and her Ed.S. in science education with a specialization in teacher preparation from Florida International University in Miami, FL and her M.A.T. with a specialization in secondary school physics. She has been a member of AAPT since 2003 and has been attending meetings since she was an undergraduate. Cochran's committee work with AAPT is extensive. She has served on the Committee on Diversity, the Committee on Women in Physics, and currently serves on the Committee on International Physics Education. She has served as Chair of the Committee on Diversity and the Committee on Women in Physics. She has also served on the Programs Committee and Nominating Committee and currently serves on the Bauder Fund Committee. She has organized sessions and workshops that have focused on diversity, equity, and inclusion and because of her expertise in this area the AAPT community looks to her as a leader. Cochran served as a guest editor of the 2017 special theme issue of *The Physics Teacher* on Race in Physics Teaching

<https://www.aapt.org/aboutaapt/Geraldine-Cochran-to-be-Recognized-as-a-2019-Recipient-of-the-Dodge-Citation.cfm>



Larry Engelhardt is Professor of Physics, Francis Marion University, Florence, SC. His B.A. in Physics was earned at Gustavus Adolphus College, St. Peter, MN and his Ph.D. in Condensed Matter Physics at Iowa State University, Ames, IA. He has served as President of his regional (SACS) section of the AAPT; and he has served on the AAPT Committee on Educational Technologies, as a member, Vice Chair, and Chair. While he was Chair, the Committee was recognized with the AAPT Committee of the Year Award. Engelhardt has been a leader for computational physics nationally and within AAPT. He is Co-PI for the Partnership for the Integration of Computation into Undergraduate Physics (PICUP) project and has organized numerous workshops and sessions at regional and national meetings. He is an organizer of the week-long PICUP summer faculty development workshops at River Falls, WI. He is an editor of the AAPT-CompADRE PICUP site and he has contributed numerous items to that collection.

<https://www.aapt.org/aboutaapt/Larry-Engelhardt-to-be-Recognized-as-a-2019-Recipient-of-Dodge-Citation.cfm>



Laura E. McCullough, University of Wisconsin-Stout, Menomonie, WI. McCullough's contributions to AAPT and to the physics community have been significant, especially in breaking down barriers for female students and women physicists around the world. She has served AAPT in a variety of leadership positions including as a member of several Area Committees and serving on other important committees. A member since 1996, she has worked on the Committee on Research in Physics Education and the Committee on Professional Concerns, serving as Vice Chair and Chair. In addition, she served on the Nominating Committee, Physics Education Research Leadership Organizing Council as Treasurer, Meetings Committee, Programs Committee, and the Books Committee. Blending her service and her scholarship, she has presented at conferences and published extensively on issues of gender in the classroom, particularly in physics. Her work in physics education research (PER) sheds light on how the classroom can be more inclusive particularly to female students. Another major project that McCullough has spearheaded is the development of a physics gender bias website (<https://gender-bias.compadre.org>).

<https://www.aapt.org/aboutaapt/2019-Dodge-Citation-to-be-Awarded-to-Laura-E-McCullough.cfm>



Brian Pyper, Professor of Physics and Director of Physics Education at BYU-Idaho, Pyper is a strong advocate of physics education. He has dedicated his time to not only maintaining the university's physics education program but has also been involved in various AAPT functions. He has served on the AAPT committee for Women in Physics, Physics in High Schools and Science Ed for the Public. He also chaired the Women in Physics Committee in 2010 and is now Chair for the Committee on Science Ed for the Public. He is also currently serving on the national Meetings Committee. He served on the AAPT national Nominating Committee in 2014-15, and has given workshops, talks, and presentations at section and national meetings almost every year since 2001. Pyper has been the Idaho-Utah Section president twice, 2004-06 and 2010-12, each time serving as the conference organizer for the Section meeting, and he has been the Idaho-Utah Section Representative since 2012.

<https://www.aapt.org/aboutaapt/Brian-Pyper-to-be-Honored-with-a-2019-Homer-L-Dodge-Citation-for-Distinguished-Service-to-AAPT.cfm>



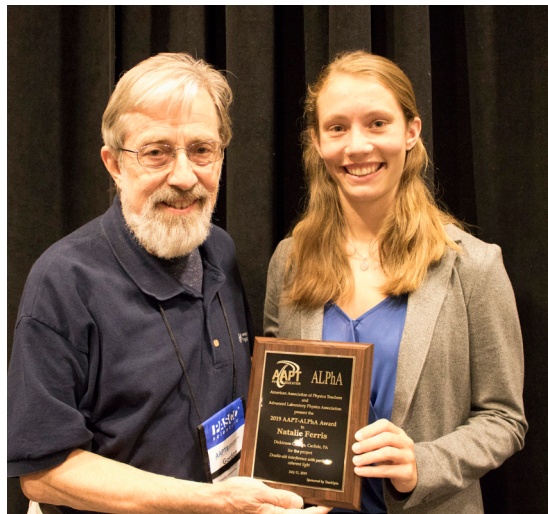
AAPT/ALPhA Award

The AAPT/ALPhA Award recognizes outstanding work in the development of an advanced laboratory apparatus/experiment by an undergraduate physics student at his/her home institution within the United States. National recognition of these projects will encourage their proliferation and help build the next generation of experimental physicists and educators. The award is only conferred if the work by the student or students is of exceptional quality, worthy of a national award.

The AAPT/ALPhA Award Committee has announced the 2018 recipient of the award is Natalie Ferris, Dickinson College. Ferris, under the guidance of faculty supervisors David Jackson and Brett Pearson, is recognized for her project on the Double-slit interference with partially-coherent light. She developed this advanced laboratory experiment at Dickinson.

As an AAPT-ALPhA awardee, Ferris received a plaque, travel expenses to the American Association of Physics Teachers Summer Meeting in 2019, and a cash honorarium. She also gave a half hour invited talk at that meeting. The faculty supervisors received a citation and travel expenses to the same AAPT meeting.

This award was established in 2014 via an idea presented by TeachSpin to AAPT and ALPhA and will be generously funded by TeachSpin for five years.

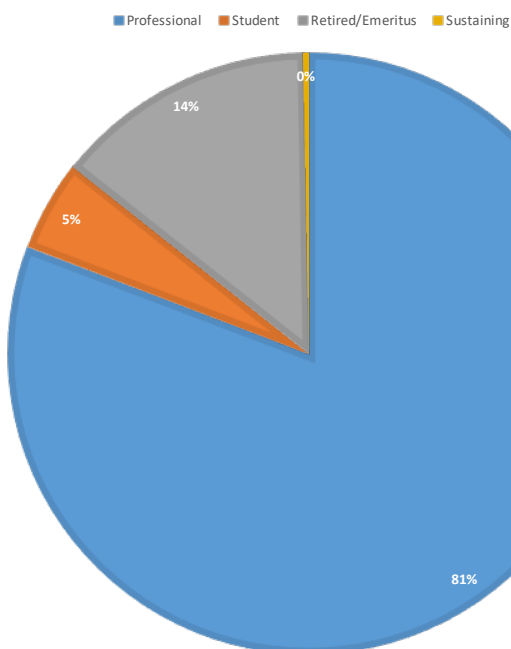


Membership

Spanning academia, research, and industry; comprised of educators, Nobel Prize winners, and students alike; our members bring a wealth of experience, diversity, and individual recognition. Most importantly, all share the same dedication to physics and the physics education community.
(December 31, 2019)

MEMBERSHIP BY MEMBER TYPE

| | | |
|----------------------|--------------|-------|
| Professional | 4,861 | 80.8% |
| Student | 295 | 4.9% |
| Retired/Emeritus | 846 | 14.1% |
| Sustaining | 17 | 0.3% |
| Total Members | 6,019 | |



The American Association of Physics Teachers thanks these generous corporate partners for their support of 2018 activities.

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Committee Contributions

Committees are essential to AAPT.

In addition to committees that advise and oversee operations, such as publications, awards, and budget, there are those that focus on advancing 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 particular area of interest.

2019 AREA COMMITTEES

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Contributions support the future of physics education and are an investment in the enhancement of physics teaching, from high school to far beyond the graduate level.

Membership Development Funds

- E. Leonard Jossem International Education Fund—Provides grants to individuals in support of international programs dealing with teaching and learning of physics.
- New Teacher Fund—Support outreach and provide reduced membership fees for first and second year physics teachers.
- Student Fund—Support reduced membership fees for physics students and outstanding teaching assistants.

Program Funds

- AAPT Annual Fund—Support ongoing outreach and development programs
- Betty Preece SEES Memorial Fund—The SEES program provides 100 minority, low-socioeconomic students with the opportunity to engage in three hours of hands-on science activities. AAPT provides lunch, career and science materials
- ComPADRE Continuation Fund—Sustain and continue the operation of the ComPADRE website
- Memorial Fund—zDiscretionary fund resulting from donations given in memory of members who are deceased. Funds are used to honor deceased members and help preserve and share their interest(s) in physics education with the greater physics community.
- Physics Olympiad Fund—Promote academic excellence by helping U.S. students prepare for and participate in the International Physics Olympiad, providing a meaningful scientific and cultural experience for team members.
- PTRA Continuation Fund—Continue the work of the PTRA program.
- Undergraduate Curriculum Task Force Fund—Provides data on the current status of undergraduate physics and guidelines for enhancing undergraduate physics programs.

Excellence in Physics Education Award Funds

- AAPT-ALPhA Award—The AAPT-ALPhA Award will be given to a student (or group of students) majoring in physics, who has built, and possibly developed, an advanced laboratory experiment that becomes part of their school’s advanced laboratory program
- John David Jackson Excellence in Graduate Education Award recognizes physicists and physics educators who, like Jackson, have made outstanding contributions to curriculum development, mentorship, or classroom teaching in graduate physics education
- Melba Newell Phillips Award Endowment—Restricted fund to endow the award that is presented to an AAPT leader whose creative leadership and dedicated service have resulted in exceptional contributions within AAPT.
- Oersted, Phillips, Millikan, Klopsteg, and Richtmyer Endowments fund the awards for AAPT’s recognition of contributions to physics education.



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Local sections increase the impact of AAPT programs and resources.

AAPT Sections spread across the United States and Canada to Mexico. Some sections follow geopolitical boundaries, serving a province, a state, or a territory. Others may serve part of a state or areas as large as six combined states. AAPT members' activity in their local sections strengthens physics education. Sections provide an outstanding opportunity to interact and network with other local physics educators. Acting together we are much stronger and have a bigger impact on physics education. Section Representatives are AAPT members who are officers in the local section.

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THE AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC.

Statement of Financial Position As of December 31, 2019 (With comparative totals for 2018)

| | DECEMBER 2019 | DECEMBER 2018 |
|--|---------------------|---------------------|
| ASSETS | | |
| CURRENT ASSETS | | |
| Cash and Cash Equivalents | \$1,190,213 | \$1,264,465 |
| Investments | 922,448 | 894,546 |
| Accounts Receivable | 395,481 | 100,315 |
| Grants receivable | 644,627 | 1,176,351 |
| Inventory | 102,697 | 5,569 |
| Prepaid expenses | 71,532 | 63,314 |
| Total current assets | 3,326,998 | \$3,504,560 |
| FIXED ASSETS | | |
| Equipment | 140,148 | \$140,148 |
| Capital lease | 12,500 | 15,000 |
| Software | 183,039 | 159,614 |
| | 335,687 | 314,762 |
| Less: Accumulated depreciation and amortization | (266,126) | (234,674) |
| Net fixed assets | 69,561 | 80,088 |
| OTHER ASSETS | | |
| Investments, net of current portion | 6,446,925 | 5,261,790 |
| Investment in ACP | 1,251,323 | 1,244,025 |
| Deposit | 4,500 | 15,833 |
| Total other assets | 7,702,748 | 6,521,648 |
| TOTAL ASSETS | \$11,099,307 | \$10,106,296 |
| LIABILITIES AND NET ASSETS | | |
| CURRENT LIABILITIES | | |
| Capital lease obligation, current position | \$ 2,266 | \$ - |
| Accounts payable and accrued liabilities | 313,587 | 309,264 |
| Accrued payroll and related liabilities | 67,213 | 163,414 |
| Unearned Revenue | 1,785,821 | 2,326,064 |
| Total current liabilities | 2,168,887 | 2,798,742 |
| LONG-TERM LIABILITIES | | |
| Capital lease obligation, net of current portion | 8,478 | - |
| Accrued postretirement benefit obligation | 431,030 | 368,684 |
| Total long-term liabilities | 439,508 | 368,684 |
| Total liabilities | 2,608,395 | 3,167,426 |
| NET ASSETS | | |
| Without donor restrictions | | |
| Undesignated | 5,879,171 | 4,639,196 |
| Board designated | 1,504,745 | 1,192,678 |
| Total without donor restrictions | 7,383,916 | 5,831,874 |
| With donor restrictions | | |
| | 1,106,996 | 1,106,996 |
| Total Net Assets | 8,490,912 | 6,938,870 |
| TOTAL LIABILITIES & NET ASSETS | \$11,099,307 | \$10,106,296 |

Statement of Activities and Change in Net Assets for the Year Ended December 31, 2019 (With Comparative Totals for 2018)

| | WITHOUT DONOR RESTRICTION | WITH DONOR RESTRICTION | 2019 TOTAL | 2018 TOTAL |
|---|---------------------------------|---------------------------|--------------------|--------------------|
| REVENUE & SUPPORT | | | | |
| American Journal of Physics | \$1,508,198 | - | \$1,508,198 | \$1,556,854 |
| The Physics Teacher | 912,905 | - | 912,905 | 960,210 |
| Membership | 757,856 | - | 757,856 | 801,755 |
| Meetings, workshops and projects | 880,248 | - | 880,248 | 904,015 |
| Grants | 1,375,402 | - | 1,375,402 | 1,309,584 |
| Investment Income (Loss) | 894,234 | 241,224 | 1,135,458 | (401,678) |
| Other Publications | 3,677 | - | 3,677 | 67,868 |
| International Physics Olympiad | 136,171 | - | 136,171 | 139,375 |
| Earnings (Loss) on investment in ACP | 7,298 | - | 7,298 | 267,287 |
| Contributions | 154,003 | 617 | 154,620 | 43,097 |
| Miscellaneous Income | 1,620 | - | 1,620 | 43,080 |
| Net assets released from restrictions | 38,059 | (38,059) | - | - |
| TOTAL REVENUE AND SUPPORT | 6,669,671 | 203,782 | 6,873,453 | 5,691,447 |
| EXPENSES | | | | |
| Program Services: | | | | |
| American Journal of Physics | 265,581 | - | 265,581 | 539,837 |
| The Physics Teacher | 581,472 | - | 581,472 | 712,237 |
| Memberships | 697,664 | - | 697,664 | 628,112 |
| Meetings, workshops and projects | 1,315,027 | - | 1,315,027 | 1,152,474 |
| Grants | 1,591,186 | - | 1,591,186 | 1,596,045 |
| Other Publications | 654,242 | - | 654,242 | 857,641 |
| Total program services | 5,105,172 | - | 5,105,172 | 5,486,346 |
| Supporting services: | | | | |
| General and administrative | 526,966 | - | 526,966 | 580,006 |
| Fundraising | 336 | - | 336 | 1,316 |
| Total supporting services | 527,302 | - | 527,302 | 581,322 |
| Total Expenses | 5,632,474 | - | 5,632,474 | 6,067,668 |
| Change in net assets before other item | 1,037,197 | 203,782 | 1,240,979 | (376,221) |
| OTHER ITEM | | | | |
| Change in post-retirement plan obligation | (62,346) | - | (62,346) | (22,495) |
| Change in net assets | 974,851 | 203,782 | 1,178,633 | (398,716) |
| Net assets at beginning of year | 6,938,870 | 1,223,085 | 8,161,955 | 7,337,586 |
| Net asset at End of year | \$7,913,721 | \$1,426,867 | \$9,340,588 | \$6,938,870 |

2019 In Memoriam

AAPT Member and Physics Community Obituaries

Remember someone special by giving a gift in their memory...

Donate to the Memorial Fund at aapt.org/Membership/memoriam.cfm.

Barbara Lotze

JANUARY 17, 2019

Born January 4, 1924 in Mezokovesd, Hungary, Barbara moved to Budapest with her family at the age of ten. In 1956 she was awarded a diploma in applied mathematics with honors from Eötvös Lorand University of Sciences. She fled Budapest during the Hungarian Revolution and spent time in a refugee camp in Austria before receiving a Rockefeller Foundation Grant to enroll as a doctoral candidate in mathematics at Innsbruck University, where she was granted a PhD in mathematics and theoretical physics in 1961. She married her late husband, Dieter Lotze, in 1958, and they immigrated to the United States in 1961, both accepting jobs at Allegheny College in Meadville, PA, and becoming naturalized citizens in 1967. Lotze was offered an Assistant Professorship in the Physics Department at Allegheny College in 1963, and became a Professor Emeritus of Physics, chair of the department from 1981-1984. She continued teaching until her retirement in 1990.

Since 1963, Lotze has been a member of the American Physical Society (APS), the American Institute of Physics (AIP), the Spectroscopy Society of Pittsburgh (SSP), the Society for Analytical Chemists of Pittsburgh (SACP), and the American Association of Physics Teachers (AAPT). She was a member of the Western Pennsylvania AAPT Section, serving as their Section Representative and Council member for eight years. She has also served on the Committee on Women in Physics Education and as its chairperson. During her tenure on this committee, Lotze organized some of the Association's most noteworthy sessions involving women in physics. In 1986 AAPT honored her with the Distinguished Service Citation and the Certificate of Appreciation for her important contribution to the teaching of physics.

During her career, Lotze presented numerous papers at professional meetings, organized and lectured at symposium. She served as president of the Hungarian Educators' Association, and authored, edited and contributed to multiple publications about physics and the Hungarian Revolution. In 1995, she established, through AAPT, an Endowment for the Advancement of Physics Education in the United States, which grants a stipend to Barbara Lotze Scholarship recipients. She had a passion for teaching and wanted to ensure that AAPT supported students who wanted to be future physics teachers. Though she remained active in research and publication, her primary focus was on her role as an educator.

Elisha Huggins

JUNE 18, 2019

Elisha (Lish) Huggins passed away on June 18 at the age of 85. Huggins was an undergraduate at MIT and received his Ph.D. degree at Caltech under Richard Feynman in 1962.

In his thesis, he investigated the quantum interaction of gravity with electrons. As he described later: in an attempt to find an intuitive flat space explanation of the 43 seconds of arc per century perihelion advance of Mercury's orbit he, instead, discovered eight new energy tensors that could be used in Einstein's general relativity equations. The scalar field term, which now plays a major role in conformally invariant field theories, was named the "Huggins term" by Murray Gell-Mann.

Huggins taught at a Dartmouth College from 1962 to 2001 and was an

early pioneer in the use of computers as physics instructional tools. He has authored a number of physics introductory textbooks including Physics 2000 which introduces special relativity in the first week of the course, allowing for greater inclusion of modern physics than is normally the case. Professor Huggins developed an award winning software program for "MacScope" which allows a computer to be used as a powerful storage oscilloscope.

The Homer L. Dodge Citation for Distinguished Service to AAPT was awarded to honor Professor Huggins in 2015 in recognition of exceptional contribution to the association. Among the non-physics awards he was proud of: an Inspirational Trophy for MIT crew, and, after years of ski lessons—an expert skier classification!

Frederick Reif

AUGUST 11, 2019

Frederick Reif, emeritus professor in Physics and Psychology at Carnegie Mellon University, died on August 11th, 2019. He was 92. A member of the Carnegie Mellon faculty for eleven years, he taught previously at UC Berkeley for twenty-nine years and the University of Chicago for eight years. Fred had a prolific scientific career, where he studied a wide range of topics from superfluids to cognition and education.

Frederich (later Frederick) Reif was born in Vienna, Austria in 1927 to Gerschon Reif, a dentist, and Klara (Chaja Lea) Gottfried Reif, a homemaker, who had come to that city after World War I from their native Poland (until the war the province of Galicia in the Austro-Hungarian empire). Along with his younger sister Liane (b.1934), they lived very comfortably near the Prater. Fred received violin lessons, in which he excelled (and which would provide a lifelong solace) and began studies at an academic Gymnasium (high school) at age 10.

With the rise of the Nazi regime, and particularly after the November 1938 Kristalnacht pogrom, their lives changed drastically. Fred's father committed suicide just prior to their departure on the ill-fated S.S. St. Louis, which was bound for Cuba with 937 Jewish refugees, but forced to return to Europe, where Fred, his mother, and his sister disembarked in France. They lived as refugees supported by international Jewish aid in Loudon where Fred learned French, and when the Germans had occupied northern France in Limoges where he attended Lycée. In September 1941 they managed to secure a visa and passage to emigrate, sponsored by relatives (Klinghoffer family) in New York. They made their way across Spain to Portugal, where they set sail. As a teenager, with his knowledge of French, Fred assumed a fatherly role in making important decisions for the family.

Fred completed Erasmus Hall high school in Brooklyn, New York and began studies at Columbia University, but at age 18 was drafted into the U.S. Army. After basic training he was tasked with strategic language study and sent to Yale to learn Japanese. Upon completing his service, he returned to Columbia (BA 1948) and continued on to Harvard University to study Physics (PhD 1953). Fred's first faculty position was in the Physics Department at the University of Chicago where he worked with Enrico Fermi (1953 to 1960), then he was hired as a professor of Physics and Education at the University of California at Berkeley (1960 to 1989), and finally he served as a professor of Physics and Psychology at Carnegie Mel-

lon University (1989 to 2000). Thereafter he held the status of professor emeritus at both UC Berkeley and Carnegie Mellon.

Fred's books *Fundamentals of Thermal and Statistical Physics* (1965), *Statistical Physics* (Berkeley Physics Series, 1967), and *Understanding Basic Mechanics* (1995) remain standard texts in the field today. After more than ten years' research in physics and a dozen important papers on topics such as the quantization of vortex rings and gapless superconductivity, he turned to research in education. He was among the pioneers in the development of the phenomenon of physics education research in the 1960s, a field he was devoted to as "analytical yet humanly compelling." He also co-founded its first formal, interdisciplinary PhD program, known as the SESAME program (Graduate Group in Science and Mathematics Education) at University of California, Berkeley in 1969 together with Bob Karplus. At Carnegie Mellon, he was instrumental in introducing numerous educational innovations to the Physics Department, including group work with white boards, undergraduate teaching assistants, and interactive teaching methods like concept tests in lectures to gauge student comprehension (early precursors to today's "clickers"). He also made a profound, lasting, and much-adored influence on the Science Teaching Department at the Weizmann Institute of Science in Rehovot, Israel. In 1994 he was awarded the Robert A. Millikan Medal from the American Association of Physics Teachers, which recognizes those who have made notable and intellectually creative contributions to the teaching of physics. He was also a Fellow of the American Physical Society and the American Association for the Advancement of Science, and in 1988 he received a Phi Beta Kappa Teaching Excellence Award. His final book, *Applying cognitive science to education: Thinking and learning in scientific domains*, was published in 2008 by the MIT Press.

As one of his former students put it, "Fred was distinctively Fred." He was a singular character whose difficult early years shaped him in profound ways. A pessimist who loved optimists, he spent most of his energies on his considerable professional achievements, but late in life he agreed to recount his Holocaust experiences to Pittsburgh-area high school students. He also had soft spots for teddy bears and bubbly personalities. Fred's first wife was "queen of carbon science" Mildred Dresselhaus. He is survived by his wife, sociological gerontologist and nurse Laura (Ott) Reif, former wife and cognitive scientist Jill (Larkin) Wellman, his sister and biochemist Liane Reif-Lehrer, brother-in-law and biochemist Sam Lehrer, nephew and artist Damon Lehrer (with his wife Aimee Lebrun and son Nathan Huckleberry Lebrun Lehrer), and niece, cultural anthropologist Erica Lehrer.

