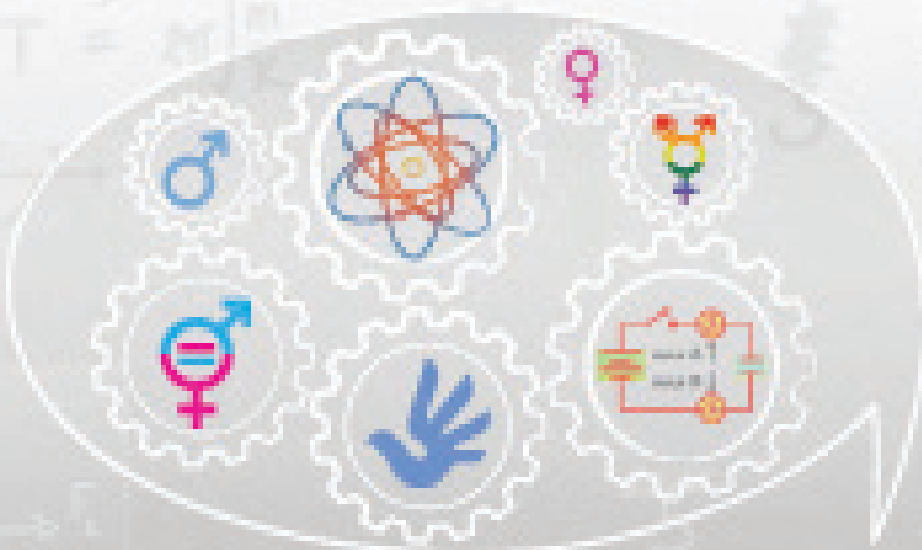


AAPT 2020 Annual Report

Sex and Gender



$$E = mc^2$$

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Beth A. Cunningham

2020 in Review

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President's Report

CHANDRALEKHA SINGH



My AAPT Presidency from end of the AAPT Winter Meeting 2020 to the end of Winter Meeting 2021 was an exceptionally difficult time for most people. At the end of February 2020, COVID-19 struck and by the middle of March many of us were confined to our homes teaching our students on Zoom or other similar electronic platforms. Then, in light of recent and historical violence against Black people in the US, AAPT affirmed its commitment to diversity, equity and inclusion and stood in solidarity with Black communities who experience systemic racism. What was heartening was how the AAPT members stuck together as a community and supported each other and our students. I want to thank our members for recognizing what different students have been going through in these challenging times and being flexible and accommodating. I am also grateful for the fact that the AAPT members kept their focus at the big picture goals and objectives of their courses and did their very best to support all students and particularly those most vulnerable in these challenging times. We are better off for it! My Presidency ended around the same time as the Capitol riot. AAPT strongly condemns such violent assault on our democratic institutions and principles. A peaceful transition of power is essential for democracy, education and science. AAPT will continue to do its very best to create equitable and inclusive learning spaces in which all students have the opportunity to learn physics in a safe and supportive environment.

Even through these extremely challenging times throughout my Presidency, we continued to make progress on all of our four intertwined goals based upon the AAPT strategic plan. In particular, we continued to engage and invigorate the vibrant community of physics students and physics educators, enhanced professional development opportunities for physics educators, enhanced the visibility and role of AAPT as an expert on physics education policy and practice, and enriched the field by supporting the diversity of physics students and educators at all levels. Throughout, AAPT continued to support projects and activities that ensured that all teachers have access to best practices and high-quality instructional materials that meet their needs, support their efforts in curriculum

development and account for regional differences. There were multiple places and meetings where ideas from members and committees got discussed. For example, at several remote venues such as AAPT Coffee Hours and at the National Meetings, we continued to brainstorm issues pertaining to creating learning spaces that leverage student expertise in the science and physics classroom and establish classrooms where instructors are informed by students and are culturally sensitive. We continued to emphasize the fact that the learning spaces should foster inclusivity and dismantle gatekeeper mentality. We continued to 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.

In all of our activities, we try to be reflective and think through challenges, resource needs, and member value. We investigate if there are examples from other organizations of practices we should learn from and bring in membership and AAPT Staff expertise. We prioritize things based on a number of factors and continue to strategize how to move big ideas forward and how to best support the work of various area committees. One of the issues we have been brainstorming is how to get more members, especially early career members active in committee and leadership efforts.

Our recent efforts have included expanding voting privileges for student members, holding diversity, equity, inclusion (DEI) plenaries/workshops during the conferences and enhancing DEI resources at all levels. With regard to public policy pertaining to physics education and science education in general, the AAPT Board had very productive virtual congressional visits in 2020 with

“I am also grateful for the fact that the AAPT members kept their focus at the big picture goals and objectives of their courses and did their very best to support all students and particularly those most vulnerable in these challenging

the support of the AIP Public Policy Team.

Finally, I would like to thank the AAPT members for the honor and privilege of serving you. I would also like to thank you for all the great work you do every day. AAPT accomplishes great things due to the dedication, commitment, and hard work of members like you. I would also like to thank the AAPT Executive Officer, Associate Executive Officer and all of the AAPT Staff members for everything they do for AAPT. I would also like to thank all of the AAPT Area committees and all of the other committees and task forces for doing great work and helping us think about the big picture. Last but not least, I would like to thank the Section representatives who help us make appropriate connections to the local/regional efforts and to the Board of Directors with whom I have worked closely for the last few years. I have learned a lot from all of them and many of them have become my very close friends. Thanks again for this opportunity to serve you!

Sincerely yours,

Chandralekha Singh

A handwritten signature in blue ink, appearing to be 'Chandralekha Singh', written in a cursive style.

Executive Officer's 2020 Annual Report

BETH A. CUNNINGHAM



It is hardly news to anyone that 2020 turned out to be a very different year than we expected. Despite the events of the year including the pandemic and movement for racial justice, AAPT remains healthy and continues to provide support to the physics education community. Our membership decline has slowed down and we ended the year with a surplus in operations. This report summarizes how we were able to weather these challenging times and continue to serve our members and the physics education community.

“Despite the events of the year including the pandemic and movement for racial justice, AAPT remains healthy and continues to provide support to the physics education community.”

AAPT's responses to the events of 2020 included:

- Staff moved to “work from home” on March 17th. Immediately after this, the American Center for Physics (which houses AAPT's headquarters) was closed except for a few hours three days a week. This changed to 25% occupancy in September. Staff members were able to transition smoothly to work from home and support programs, pay bills, fulfill orders to the Physics Store, and send renewal notices during this time. We had practiced several emergency preparedness drills prior to the pandemic which helped in our success in moving to our home offices.
- We started sending weekly teaching resources to members starting in March.
- We initiated Virtual Coffee Hours starting in April. This allowed members to discuss how they were handling teaching in a virtual environment and, in the fall for some members, how to teach students in class and labs and maintain social distance.
- All AAPT's contests (PhysicsBowl, High School Photo Contest, Apparatus Contest, and the training camp for the U.S. Physics Team) were canceled.
- The 2020 Summer Meeting, New Faculty Workshop, High School Teacher Quantum Workshop, and Physics Department Chairs Conferenced moved to being virtual. The 2020 Summer Meeting was AAPT's first national virtual meeting.
- Consultants with expertise in nonprofit IT conducted an IT assessment and prepared a one-year IT roadmap. This roadmap will allow AAPT to better serve our members and the physics education community. One outcome was the hiring of a virtual Chief Information Officer coach to help the staff implement needed updates and gain expertise in IT strategy.
- Consultants with expertise in electronic publications produced a report in October that outlined steps to create ComPADRE Next Generation. The AAPT staff has taken the first steps in this effort, updating the infrastructure. All of the steps will take several years to implement.
- AAPT Board leadership and staff participated in #ShutDownSTEM day in June. We considered the steps we should take to better serve our diverse membership and community.
- We conducted a search for a new investment firm for AAPT's reserves. The result was to engage Truist after a 20-year positive relationship with TIAA.
- We applied and received a Paycheck Protection Program loan in the spring which was converted to a grant in December. These funds helped AAPT cover three months of staff salary and benefits.
- The AAPT staff developed financial scenarios in April for the remaining 2020 budget and produced three versions of the 2021 budget for the Finance Committee and Board to consider.

We have also been successful in receiving external support for several projects. These include:

- Measuring Learning and Improving Teaching of the Physics of Fluids in Introductory Physics for the Life Sciences (IPLS) [National Science Foundation 2021059]. This project will develop and pilot-test a Fluids Conceptual Evaluation (FCE), which will allow instructors to evaluate the effectiveness of their teaching and measure students' understanding of the concepts. While developing this assessment tool, the investigators will also develop supports to help IPLS instructors teach the physics of fluids well.
- Empowering Diverse Voices in Communicating Science [National Science Foundation 1938815]. This project supports the U.S. Delegation to the 7th IUPAP International Conference on Women in Physics. In addition to providing funding for travel to the conference and the production of the proceedings, the U.S. delegation will create a virtual workshop focused on effectively communicating science as a result of this conference
- Equity and Inclusion Physics Instruction Three Part Workshop (in partnership with the National Society of Black Physicists and the National Society of Hispanic Physicists) [American Institute of Physics]. This workshop series brings together experts in equity, diversity, and inclusion (EDI) and physics educators to focus on inclusivity in physics curriculum, instruction and grant-funded education projects.

We continue our work to make AAPT events more inclusive. The Event Participation Code of Conduct put in place in 2016 applies to both in person and virtual events. If you see or experience a potential violation of the Code of Conduct, you can submit a report using the form linked at the top of the webpage. We accept anonymous reports but we will not be able to follow up to obtain more information and it will be harder to take suitable action. The following is a summary of the Code of Conduct Incidents that have been reported during 2020 and the actions that have been taken.

- WM20: 0 incidents reported
- SM20: 2 incidents reported. Both incidents have been addressed and resolved.


I continue to participate in virtual “hot topic” workshops and events conducted by the Societies Consortium on Sexual Harassment in STEMM (AAPT is a founding member of the Societies Consortium).

We are pleased to announce the Area Committees of the Year: Diversity in Physics and Physics in Two-Year Colleges. In addition, two Area Committees received Honorable mention: Physics in Undergraduate Education and Science Education for the Public. Thank you to these four Area Committees and to the many other Area Committees for the work that they conducted in 2020. These committees are vital for preparing programming for AAPT's national meetings and providing the intellectual resources and knowledge base for the activities that we do.

The Executive Office staff continue to do our part to serve AAPT members and the physics education community. We said goodbye to Terrence Hunt, Web Developer, and Lutrina Jackson, Executive Assistant. The new Executive Assistant is Julie McIntyre who comes to AAPT with over 20 years of experience in a number of positions supporting top executives in nonprofit and for profit organizations. We have a number of programs that we are planning to launch in 2021. These include a new online community for AAPT members and committees, the launch of the Physics and Astronomy SEA Change pilot with five physics departments as the first participants, the first Doc Brown Futures Award to be given at 2021 Winter Meeting, and a conference on quantum information systems for high school teachers to be offered in the summer. We are excited to serve the community and look forward to a productive 2021.

We hope you continue to see value in membership and renew again in 2021. 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



Message from the AAPT President, Past President, and Executive Officer Regarding the Impact of COVID-19 on AAPT and Our Members

We recognize that the past few weeks have been some of the most tumultuous and stressful for many in the United States and beyond because of COVID-19. We know that some of you now have school-aged children at home and/or are having to care for sick loved ones. We all have become vigilant about practicing social distancing and are staying at home and working from home. Many of us know colleagues who are quarantined. Every part of our lives has been impacted by the current circumstances.

We also understand that your lives as physics educators have been changed, too, with many of you having to quickly convert your courses to be fully online. But what is reassuring about our AAPT community is that while your methods of instruction have had to quickly adapt, your core commitment to your students and their learning has remained rock-solid. We applaud you for being flexible, compassionate, creative, and supportive while your students adjust to these extremely challenging circumstances.

We have heard uplifting stories from some of you who have had interactions with your students that go well beyond physics content, reminding students that this is hard and you are there to support them --just like an oasis in the desert. We have also heard hard stories where our community of educators and learners are, understandably, struggling to focus on academics. We also greatly appreciate how so many of you are personalizing your instruction, recognizing that your students' individual situations may be very different at this time and some students are significantly more resource-limited than others.

We have also been uplifted by the response from the AAPT and physics community to the sudden changes in the way we are teaching and how many of you have shared resources to support the entire community. Our AAPT listservs have included so many thoughtful ways to support students and share teaching resources during this time. Many AAPT members have contacted the Executive Office to suggest resources to help other physics educators make the transition to online teaching. We are grateful for the enthusiastic response and thank everyone who has contributed. We are especially thankful that Linda Strubbe and Sam McKagan quickly built new pages on PhysPort that lists many research-based practical tips and resources. We also appreciate the list of *The Physics Teacher* and the *American Journal of Physics* articles that TPT Editor, Gary White and AJP Editor, Richard Price curated that was recently sent to you. We have been sharing these resources via email to our members and on AAPT's social media. Please continue to share your tips and resources with us at eo@aapt.org.

We realize there are many questions in light of COVID-19 about future AAPT events, particularly the upcoming 2020 AAPT Summer Meeting in Grand Rapids, MI. The health of attendees, presenters, exhibitors and staff is AAPT's top priority. We also need to consider the communities that we are visiting and make sure that we do not put the Grand Rapids community at additional risk. We will continue to monitor the situation and are following the recommendations regarding safety and precautionary measures issued by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) and we are paying attention to the directives of the governor of Michigan. We will continue to provide updates as they become available. We are actively exploring options and developing alternative plans should a change in the Summer Meeting be warranted. A number of you have communicated your concerns to us. As always, these comments are reflective and thoughtful and they are extremely helpful. We appreciate your patience and understanding during this unprecedented and unpredictable time.

The next few months will continue to be full of uncertainty. But, we know one thing - that we will get through this by supporting each other and our students. AAPT will continue to support your work and physics education. We will be excited to see you at a future AAPT event.

Take care and be well,

Chandralekha, Mel, and Beth

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

Beth Parks, Editor, effective September 1, 2020

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 2020 (Volume 88)
- 960 pages, 668 reviewers, 78 papers published—13% acceptance rate
- 4 open access articles
- 7,539 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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Barry R. Holstein, University of Massachusetts

Harvey S. Leff California State Polytechnic University, Pomona

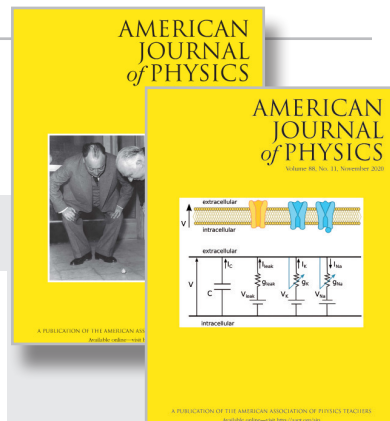
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Effective September 1, 2020

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THE PHYSICS TEACHER (TPT.AAPT.ORG)

Gary D. White, Editor, The George Washington University
Geraldine L. Cochran, Co-editor of Special Collection on Sex, Gender, and Physics Teaching,
Rutgers University

Pamela R. Aycock, Managing Editor, Appalachian State 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 2018, 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. More than 30 authors submitted articles in response to the call, and many successfully made it through the TPT doubly anonymous peer-review process, shepherded through under the able leadership of Dr. Geraldine Cochran as co-editor. The result is an unprecedented collection, “Sex, Gender, and the Physics Classroom,” featured throughout TPT issues from May 2020 through January 2021; seek it out!



COLUMN EDITORS

And the Survey Says...

Susan C. White, AIP, College Park, MD

AstroNotes

Joe Heafner, Catawba Valley Community College, Hickory, NC

Janelle M. Bailey, Temple University, Philadelphia, PA

Donald A. Smith, Guilford College, Greensboro, 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, Institute of Teacher Training, Mainz, 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, Shorecrest Preparatory School, St. Petersburg, FL

Technology in the Classroom

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

WebSights

Dan MacIsaac, SUNY-Buffalo State College, Buffalo, NY

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Debbie Bott, Advertising,
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Kelly O'Shea, Little Red Schoolhouse & Elizabeth Irwin High School

Aaron J. Schuetz, Yorktown High School

Daniel M. Smith, South Carolina State University

Rebecca Vieyra, Inter-American Teacher Education Network

THE PHYSICS TEACHER STATISTICS

- 9 issues—January–May, September–December 2020 (Volume 58)
- 688 pages, 972 reviewers, 160 papers, and 88 contributions to monthly columns (168 international authors/co-authors)—45% acceptance rate
- 6,784 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 Update for 2020



The AAPT supports its members and the physics education community at large by hosting and sharing resources online for instructors and students. AAPT/ComPADRE collaborates with many authors, projects, and organizations to share curricular content, provide recommendations for physics instructors, host proceedings of national physics education conferences, all to highlight the best in physics education.

The abrupt shift to online instruction due to COVID-19 had a significant impact on the AAPT/ComPADRE activities.



Physport: Physport provides research-based recommendations, teaching resources, and best practices for physics instructors. In response to the pivot to online instruction, Physport Editors and contributors created and posted guidance for handling this transition. By mid-March of 2020, several Expert Recommendations were created to help instructors run effective online classes and labs, find resources that can be used in an online setting, and maintain student-centered pedagogical approaches. These

recommendations also included help for supporting the health and well-being of students and instructors facing stress and disruption. Throughout the spring semester, recommendations from the AAPT community were solicited and added to these essays.

Physlets and Physlets Quantum Physics: AAPT/ComPADRE hosts these simulation-based, HTML5 texts by Wolfgang Christian, Mario Belloni, and Anne Cox. The online, interactive format of these materials make them useful for student-centered explorations in remote classes. They are one example of providing hands-on student activities online. The usage of these materials nearly tripled in 2020.



Conferences: AAPT/ComPADRE provides the web infrastructure for AAPT-related conferences and workshops. In 2020, this required significant changes to handle the shift to virtual events. As it has done for many years, ComPADRE provided the web interface and conference proceedings for the 2020 Physics Education Research Conference, including connections to the online conferencing system. The ComPADRE infrastructure was also used when the summer PICUP workshop went virtual. PICUP is an AAPT project for integrating computation into undergraduate physics.

Development of online community portals continued in 2020.

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. Additions and improvements to the content, user interface, and community events on the Portal were made in 2020.

Energy and Equity Portal: The online presence for this grant-funded project integrating topics in energy and equity for high-school physics was launched. The tools developed and lessons learned from the Living Physics Portal were used to provide the infrastructure for this effort.

Strategic Planning Task Force: Working with external consultants, this task force explored the current structure and future opportunities for the AAPT/ComPADRE environment. This included discussions with a cross-section of the AAPT community. Recommendations were made for closer integration with AAPT strategic goals, branding, and technology.

Traffic Report:

Overall, ComPADRE served over 825,000 users for more than 1,225,000 sessions and 3,225,000 page views in 2020.

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 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 website stresses ease of navigation and guides visitors based on their role within 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.

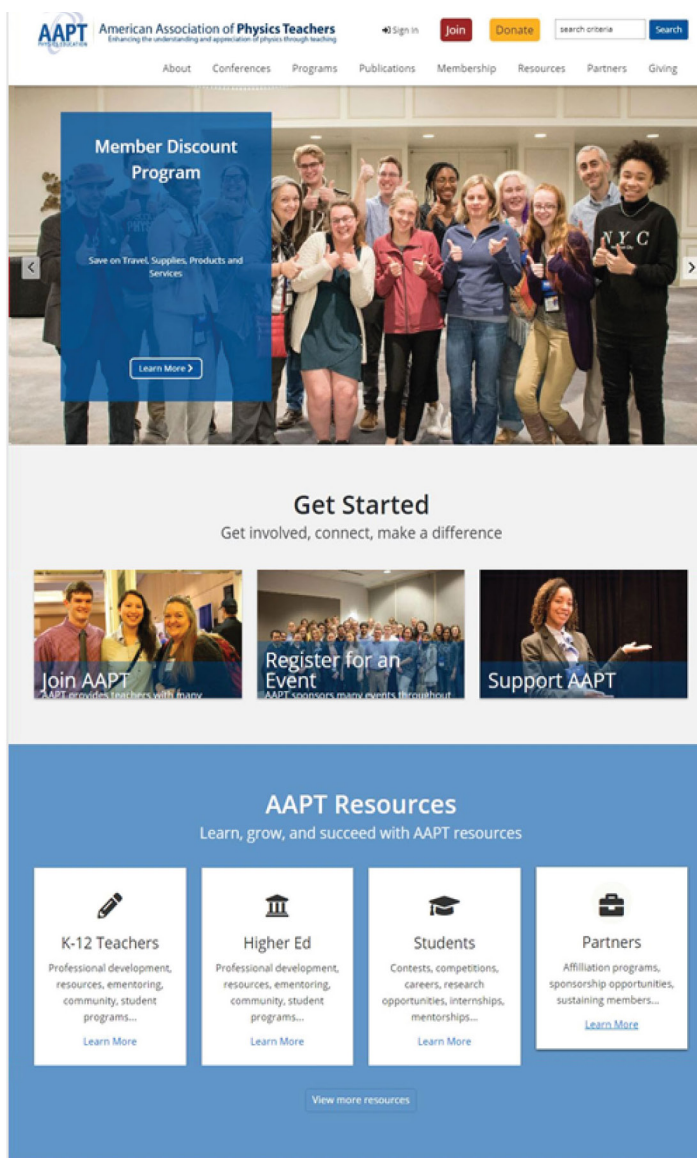
- A diversity emphasis which promotes minorities in the sciences using a community management system
- A member spotlight that highlights those members that are doing or have done significant work on AAPT projects and other projects that support the greater physics education community
- A K-12 portal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

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 books program through a partnership with the American Institute of Physics.

For 2020 aapt.org had:

- 459,233 visits • 1,215,665 pageviews • 2.65 pages per visit
- 256,837 new visitors *All from 203 countries/territories*
#1 U.S., #2 India, #3 China, #4 Canada, #5 United Kingdom



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 will deploy a member engagement platform in 2021.

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 October 2020
Privacy Statement

AAPT News

2020 AAPT Board of Directors Election

The election of officers for the AAPT Board of Directors will end October 16. Student members are eligible to vote in this election for the first time. Members with a paid through date greater than or equal to 7/31/2020 received instructions in mid-September through email or, if no email is on file, through the mail to help you vote electronically. Be sure your vote is submitted before the deadline. [Learn more](#) about the candidates.

Davies Named as First Recipient of the Doc Brown Futures Award

AAPT has announced that the recipient of the Doc Brown Futures Award is Kenric Davies. He has the honor of being the first recipient of this new award. The Doc Brown Futures Award 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. The award will be presented during the 2021 Virtual Winter Meeting. [Read more](#)

2021 AAPT Virtual Winter Meeting, January 9-12

Registration

Registration is now open for the 2021 AAPT Virtual Winter Meeting. Attend virtual sessions, plenaries, workshops and special activities designed with you in mind. Don't miss this opportunity to share your expertise and learn from and network with leaders in the field. [Please click here](#) for more information.

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2020 TOP AAPT NEWS STORIES

Listed below are highlighted news stories for 2020 from the eNNOUNCER. To read the full story go to <http://www.aapt.org/aboutaapt/ennouncer/index.cfm>.

JANUARY

- Richard W. Peterson Recognized with 2020 Melba Newell Phillips Medal
- David Sokoloff to Receive AAPT 2020 Oersted Medal
- Ann Walkup to Receive 2020 Paul W. Zitzewitz Excellence in Pre-K Teaching Award
- Debra Mason-McCaffrey to Receive 2020 David Halliday and Robert Resnick Award

FEBRUARY

- 2020 Winter Meeting Highlights

MARCH

- Chandralekha Sing Becomes AAPT President
- 2020 Millikan Medal Awarded to David M. Cook

APRIL

- The Impact of Covid 19 on AAPT and Its Members

MAY

- Notification to Members Concerning Amendment to By-Laws
- 2020 Summer Meeting Changed to Virtual
- Beth Parks to Become Editor of the American Journal of Physics

JUNE

- AAPT Virtual Coffee Hour and Remote Instruction Share-a-thon

JULY

- Barbara Lotze Scholarship Winners Announced
- Report on Undergraduate Physics Programs at Hispanic-Serving Institutions

AUGUST

- New Fellowship Opportunity for Underrepresented Minority Teachers of Physics

SEPTEMBER

- Davies Named as First Recipient of the Doc Brown Futures Award
- STEP UP Workshops

OCTOBER

- Delivery Options for Print Journals

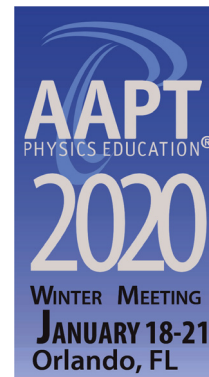
NOVEMBER

- Results of the 2020 Board of Directors Election

DECEMBER

- 2021 Virtual Winter Meeting
- PhysTec Conference 2021

National Meetings



WINTER MEETING

January 18–21, 2020, Orlando, FL

Statistics:

There were 676 attendees, 18 exhibitors, 68 sessions, 20 workshops, 0 Tutorials, 1 Topical Discussion, and 8 poster sessions/114 posters.

Program Committee Chair

Jan Landis Mader

Paper Sorters:

Larry Cook, Joseph Kosminski, Duane Merrell, Mary Winn, Elaine Gwinn, Janie Head, Ann Robertson, Nancy Easterly, Randy Peterson, Stacey Gwartney, Nina Daye, Gen Long, David Cook, Charles Winrich, Karen Jo Matsler, Tommi Holsenbeck, Kelly O'Shea,

Workshop organizer:

Anne Mardaugh, Rollins College

Highlights

The headquarters hotel for the 2020 Winter Meeting was the Caribe Royale, Orlando.

Rollins College hosted workshops on Saturday and Sunday with selections ranging from “Intro to Modeling Instruction, A PER-based Curricula” to “Using Augmented Reality, Virtual Reality, and Video Games in the Physics Classroom.” 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 Early Career and First Timers’ Social, Game Night, and a tour of the Kennedy Space Center that included a tour of the launch facilities and NASA Visitor Center where participants visited the new Astronaut Hall of Fame (from Project Mercury to the Space Shuttle Program), an Astronaut Encounter, and the actual Saturn V Rocket. Every human who stepped foot on the Moon launched from Kennedy Space Center atop a Saturn V rocket.

The 2020 AAPT Meeting of Members gave attendees the opportunity to learn about the governance and activities of their association. Secretary Blane Baker reported on the results of the 2019 AAPT National Election and the Nominating Committee for 2020. The Chair of the Section Representatives shared information regarding the activities of the sections and the AAPT Treasurer reported on the financial position of the association. Executive Officer, Beth Cunningham and President Mel Sabella presented information on the status of AAPT programs, including a conference on computational physics and the new books publishing program.

Time during the meeting was devoted to honor the memory of prominent AAPT members, Barbara Lotze, Frederick Reif, and Curtis Hiegeelke.

AAPT, together with the Society for Physics Students, AAPT hosted a The Students Exploring Engineering and Science (SEES) program. They welcomed at-risk students from Orlando area elementary schools to a fun filled morning of physics related science activities led by volunteers. The activity included transportation, lunch, career information, and science materials provided through donations to the Betty Preece Memorial Fund.

Plenaries

Jim Gates, Ford Foundation Professor of Physics, Brown University
Sylvester James “Jim” Gates, Jr., (born December 15, 1950) is an American theoretical physicist. He received two B.S. degrees and a Ph.D. degree from the Massachusetts Institute of Technology, the latter in 1977. His doctoral thesis was the first one at MIT to deal with supersymmetry. In 2017, Gates retired from the University of Maryland, and is currently the Brown Theoretical Physics Center Director, Ford Foundation Professor of Physics, an Affiliate Mathematics Professor, and a Faculty Fellow, Watson Institute for International Studies & Public Affairs at Brown University. While at the University of Maryland, College Park, Gates was a University System Regents Professor, the John S. Toll Professor of Physics, the Director of the String and Particle Theory Center, and Affiliate Professor of Mathematics. Gates served on the U.S. President’s Council of Advisors on Science and Technology, contemporaneously on the Maryland State Board of Education from 2009-2016, and the National Commission on Forensic Science from 2013-2016. He is known for his work on supersymmetry, supergravity, and superstring theory.



Jonathan Smith provides oversight and direction throughout all phases of selection, design development, engineering procurement, installation, commissioning and on-going operation of amusement rides and devices for the 12 SeaWorld Parks. His most recent projects include Iron Gwazi at Busch Gardens Tampa Bay, Ice Breaker at SeaWorld Orlando, Emperor at SeaWorld San Diego, Texas Stingray at SeaWorld San Antonio, and Pantheon at Busch Gardens Williamsburg, all debuting in 2020. Notable recent projects include Oscar's Wacky Taxi at Sesame Place and Infinity Falls at SeaWorld Orlando. Jonathan started his career with SeaWorld Parks in 2012 as a project manager in the design and engineering department at Busch Gardens Williamsburg and Water Country, USA where he played key roles working on projects and attractions such as Verbolten, Tempesto and InvadR. Jonathan is a registered Professional Engineer and LEED Accredited Professional and holds a bachelor's degree in Mechanical Engineering at the Ohio State University.



Awards



The 2020 Oersted Medal was awarded to David Sokoloff. His talk was titled “If Opportunity Doesn’t Knock, Build a Door - My Path to Active Dissemination of Active Learning.” Sokoloff is Professor of Physics, Emeritus at the University of Oregon. He earned his B.A. at Queens College of the City University of New York and his Ph.D. in AMO Physics at the Massachusetts Institute of Technology. For over three decades, he has studied students’ conceptual understandings, and developed active learning approaches (with NSF and FIPSE support). These include Interactive Lecture Demonstrations (ILDs) and the four modules of RealTime Physics: Active Learning Laboratories (RTP), both published by Wiley and co-authored by Priscilla Laws and Ronald Thornton. His work has been published in the American Journal of Physics, the European Journal of Physics, Physical Review, Physics Education Research and The Physics Teacher. He has conducted numerous international and national workshops to disseminate these active learning approaches to secondary and university faculty. Since 2004, he has been a member of the UNESCO Active Learning in Optics and Photonics (ALOP) team, presenting workshops in more than 30 developing countries in Africa, Asia and Latin America. He is contributor to and editor of the ALOP Training Manual. The ALOP Team was awarded the 2011 SPIE Educator Award. He was

awarded the American Physical Society (APS) 2010 Excellence in Physics Education Award (with Priscilla Laws and Ronald Thornton) and the American Association of Physics Teachers (AAPT) 2007 Robert A. Millikan Medal. He has been a Fulbright Specialist in Argentina (2011) and Japan (2018), is currently a member of IUPAP Commission 14 (International Commission on Physics Education), and has served in AAPT’s Presidential Chain (2009-2012)



Richard W. Peterson, recipient of the Melba Newell Phillips Medal, is University Professor of Physics – Emeritus, Bethel University, St. Paul, Minnesota. His talk, “Changed . . . by a high and humbling calling” reflected his lifetime of experience. Peterson has brought to AAPT’s executive level leadership a passion for experimental physics and its impact on the lives of students in high school, introductory and advanced laboratories. Following work with the AAPT Apparatus Committee (starting in 1976), he was NSF Principal Investigator for AAPT’s Lab Focus-’93 that sought to reinvigorate all physics teaching lab experiences. Later he helped form the AAPT Laboratories Committee with its emphasis on encouraging more effective physics laboratories. While an AAPT leader, he worked with others in the formation of ALPhA (Advanced Laboratory Physics Association) as a charter ALPhA Board member - helping organize the first ALPhA national conference (2009) at the University of Michigan. He received the American Physical Society’s (APS) prize for outstanding research at an undergraduate school and was elected an APS Fellow in 2005. He was recognized with the Jonathan F. Reichert and Barbara

Wolff-Reichert Award for Excellence in Advanced Laboratory Instruction in 2017. He served six years on the AAPT Executive Board as Secretary and four years (2003-2007) within the Presidential track - followed by three years as the first AAPT Meetings Committee Chair. His many years of dedicated and creative leadership have had a lasting impact on AAPT, how we do advanced labs as physics faculty, and on the lives of countless students.

The meeting concluded with the Presidential Transfer where Mel Sabella turned the Presidential Gavel over to incoming president, Chandralekha Singh.



National Meetings

SUMMER MEETING

July 19–22, Virtual Meeting

Statistics:

There were 1,177 attendees, 8 exhibitors, 78 sessions, 46 workshops, 0 topical discussions, and 19 posters

Program Committee Chair
Jan Landis Mader

Meeting Sponsors:

AIP Statistical Research
Digitalis Education
Expert TA
IBM Quantum Computing
Macmillan Learning
PASCO Scientific
Spreadsheet Lab Manual LLC
Vernier Software and Technology (Gold Sponsor)

Paper Sorters:

Jonathan W. Alfson
Janie Head
Tommie Holsenbeck
Nina Daye Morley
Karen Jo Matlser
Kelly O Shea
Reed Prior
Diana Sachmpazidi
Toni Sauncy
Gary White



2020 AAPT VIRTUAL
**SUMMER
MEETING**
JULY 19-22

AAPT. Visit [AAPT.ORG](https://www.aapt.org) for more info

Highlights

Almost 1200 physics educators joined in AAPT's first large scale, multi-event conference using a virtual platform. The result of the 2020 Virtual Summer Meeting indicates that after six-months of teaching in virtual classrooms from K-12 through graduate school, physics teachers have adjusted well to this new format. Plenary and general sessions for this meeting were presented live and sessions were pre-recorded with access throughout the conference.

Physics Education Researchers participated in the virtual post-meeting PER Conference, Insights, Reflections, & Future Directions: Emergent Themes in the Evolving PER Community (<https://www.compadre.org/per/conferences/2020/>).

Awards

The Klopsteg Memorial Lecture Award was given to James Kakalios, University of Minnesota, Minneapolis, MN. His talk was "Superheroes and Public Outreach (No Spandex Required)". He noted that costumed superheroes seem to dominate our movie and television screens, making them an excellent delivery system to bring real physics to students and the general public. While the super-powers these characters possess clearly violate the laws of nature, often times how the super-heroes and super-villains utilize their powers is consistent with known physical laws.



One can draw the connection between the Black Panther's vibranium suit and conservation of energy, while the Infinity Stones (the MacGuffin in 22 Marvel Cinematic Universe films) can be connected to Emmy Noether and her theory explicating a deep connection between all conservation principles and symmetries in the laws of physics. People come for the superhero ice cream sundae and stay for the real science.



Ann Walkup, recipient of the 2020 Paul W. Zitzewitz Award for Excellence in K-12 Physics Teaching is a high school teacher at Cranston High School East in Cranston Rhode Island. Cranston High School East is both the largest and most diverse high school in Rhode Island according to US News and World Report, with 60% minority students and 46% economically disadvantaged. Many are transient, have unconventional families, do not speak English, or have mental/physical disabilities. Many would think these students incapable of learning physics. In her talk, "Let's All Do Physics!: Integrating Special Education Accommodations in Physics Curriculum," Walkup says "This is a travesty; anything can be taught once you find common ground." She takes the time to learn students' stories, connect with their backgrounds, and make what she teaches relevant to their lives. She enables them to feel successful and confident in their abilities. Then she makes physics concepts relatable on their terms.

National Meetings continued



David M. Cook, Lawrence University, Appleton, WI, received the 2020 Robert A. Millikan Medal for his notable and creative contributions to the teaching of physics. In his talk, Attempting the (seemingly) impossible, he noted that “Students who are never required to do what they think they cannot do never discover what they can do.” Confidently attempting the (seemingly) impossible is an important component of individual and departmental growth. Confidently attempting the (seem-ingly) impossible is an important component of individual departmental growth. Students’ growth is damped if they are never gently nudged to attempt the impossible. Departmental growth is limited unless the department regularly undertakes coordinated ambitious activities that may initially seem unlikely to succeed. Cook quoted several great philosopher leaders including Albert Einstein who said, “Failure is success in progress” and Nelson Mandela who said “Anything always seems impossible until it is done.” Cook concluded noting that Persistence is a virtue, failure is not to be feared, and confusion is good.

The Summer 2020 recipients of the Homer L. Dodge Citations for Distinguished Service to AAPT were Douglas Brown and Dan Burns. Jose D’Arruda was recognized as an AAPT Fellow.

Plenaries



On Sunday morning AAPT hosted a Plenary, “A Model for Interdisciplinary Research & Teaching in Physics.” Andrew Barnard, associate professor of Mechanical Engineering and Director of the Great Lakes Research Center at Michigan Technological University. Dr. Barnard is Board Certified by the Institute for Noise Control Engineering (INCE) and is a Certified LabVIEW Developer (CLD). He is currently the Vice President for Education of INCE and an associate editor for Noise Control Engineering Journal (NCEJ). He previously spent 8 years as a research associate at the Applied Research Laboratory at Penn State. Dr. Barnard has interests in mechanical vibration, noise control, and acoustics. His specialties include dynamic test and measurements, remote sensing, signal processing, and real-time control systems. He is the advisor and founder the SENSE program (Strategic Education through Naval Systems Experiences) at Michigan Tech and is the advisor of the Naval Systems Engineering Minor. In addition to teaching and research, he works on commercialization of technology and is a founder or co-founder of three companies.

Mildred Boveda, from Arizona State University, Mary Lou Fulton Teachers College spoke on Intersectionality and Transdisciplinarity in Physics Education during the Monday morning plenary. Recent studies

raise awareness of the nature of diversity and inclusivity concerns and propose best practices for reducing bias for women, LGBTQ+ students, racially/ethnically minoritized students, and students with disabilities in physics education. While considering individual sociocultural categories (e.g., gender) in isolation has its merit, it is insufficient to adopt a unidimensional approach when attempting to address the disparities in representation and opportunities in physics. Instead, the simultaneous influence of multiple sociocultural identities such as age, gender, citizenship, class, dis/ability, ethnicity, linguistic origin, and sexuality must be considered. Faculty must also examine how interconnected sociocultural identities—their own, those of students, and of other educators—influence curricular decisions and pedagogical practices, as well as power dynamics in the classroom. Scholars in equity-based education communities (e.g. bilingual and special education), ethnic studies, and women, gender, and intersectional studies can inform how physics educators may collaboratively locate and address biases in curriculum and pedagogical practices, including those related to overlapping and interconnected oppressions. Intersectional consciousness will thus be present as a collaborative approach to advancing intersectionality and transdisciplinarity in physics education.



STEP UP: A Social Movement to Promote Cultural Change in Physics was led by Zahra Hazari, Florida International University with Bree Barnett Dreyfuss, Amador Valley High School Colleen Epler-Ruths, Shikellamy High School Brian Kays, Ramona Convent Secondary School John Metzler, Niles West High School and Laura Sloma, East Kentwood High School and Freshman Campus as participating speakers. Physics as a field, is developed and maintained by a community, and thus reflects historic and modern cultural



norms set by that community, both consciously and unconsciously. This includes how physics is defined, what it means to do physics, and what it means to be a physicist. In order to shift cultural meanings to be more inclusive and equitable, we need to reflect on the norms and collectively work to disrupt those norms that marginalize groups and limit advancement. One approach is to pose counternarratives that disrupt narrow stereotypical viewpoints. Counternarratives are central to the STEP UP project, which focuses on mobilizing thousands of physics educators to inspire young women in physics. STEP UP presents counternarratives to students through lessons/materials that explicitly discuss the role of bias in the field and highlight a broad range of careers/goals pursued by diverse individuals with a physics degree. Another counternarrative is presented through the agents of change who lead the movement – teachers. In a culture that undervalues teachers and teaching as a profession, a powerful counternarrative is that teachers can collectively affect cultural change.



The APS Plenary, co-sponsored by the American Physical Society Forum on Education, featured Wolfgang Bauer and Artemis Spyrou, Michigan State University. Bauer's talk, *The Physics of Green Energy*, reviewed the near-exponential increase of greenhouse gas emissions due to human activity and the associated global warming. At present, humans consume approximately 20 TW of average power, overwhelmingly supplied by fossil fuels. What does it take to supply this amount of power from renewable resources? There are physical limitations (Betz Limit, Shockley-Queisser Limit, storage cycle efficiency, raw materials constraints, ...), but there are also economic and financial ones. This presentation gave a global perspective as well as a local perspective, with the campus of Michigan State University as a sample of what has been, what can be, and what needs to be accomplished.



Artemis Spyrou's talk, *Nuclear Science: Rare Isotopes at FRIB and What to do With Them* noted that one of the big questions in Nuclear science is how neutrons and protons combine together to form bound systems (isotopes) and what are the properties of each combination. At Michigan State University (MSU) there is a 50-year history of producing and studying the rarest of these isotopes. Some can be used for practical applications for the benefit of society, and others live for fractions of a second and are only important in explosive stellar processes. The next generation rare isotope laboratory for the US, the Facility for Rare Isotope Beams (FRIB) is currently under construction at MSU. FRIB is expected to give us access to roughly 1000 new isotopes, never before created or studied in a lab. She discussed how rare isotopes are produced at FRIB and the important scientific questions that FRIB will address. She also presented resources that were developed by the facility's outreach team to help scientists and teachers bring the science of FRIB into the hands of students of any age.

AAPT invited attendees to participate in the President's Town Hall led by AAPT President, Chanrleka Singh. The new candidates for the Board of Directors were introduced using individual introductory videos. The Strategic Plan was discussed and members had an opportunity to participate in a Question and Answer session.

PHYSICS EDUCATION RESEARCH (PER)

PER Conference 2020—Virtual Conference

July 22

“Insights, Reflections, & Future Directions: Emergent Themes in the Evolving PER Community”

(496 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 Mini-Grants

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:

Establishing scientific norms in the lab: a spotlight on the

instructor, Smadar Levy and Edit Yerushalmi, Weizmann Institute of Science

Co-authors: Russell Clark, Danny Doucette, Dimitri R. Dounas-Frazer, Eugenia Etkina, Dorothy Langley, Esther Magen, Joshua Rutberg, Chandralekha Singh, Zehorit Kapach

Recent results on the classroom effectiveness of Virtual Reality and Augmented Reality technology, Chris Orban, Ohio State University

Bridging Session Q & A --Geraldine L. Cochran, Joseph Krajcik, Sarah B. McKagan, Valerie K. Otero, Susan R. Singer, Robert H. Tai

Parallel Session Cluster 1: Talk Symposium

Establishing scientific norms in the lab: a spotlight on the instructor

Parallel Session Cluster 1: Custom Format

Expanding your network: IPER Community buildathon

Parallel Session Cluster 1: Juried Talk Session

PERC Organizing Committee

Juried Talks I

- Recent results on classroom effectiveness of Virtual Reality and Augmented Reality Technology
- Students' Understanding of Fluids
- What was, is and will be Physics Education Research
- Diverse Career Paths in Physics Education: A Panel Discussion
- Evaluation of Innovative Reforms in Upper Division Physics Courses
- Future directions in PER: Reflecting critically on student success

Juried Talks II

- Using the theory of conceptual blending at the mathematics-physics interface
- All things Get the Facts Out: Perceptions, emotionally compelling messages, and data mining
- Assessing Teaching Effectiveness: We Need More Than Just Student Evaluations

Juried Talks III

- Measuring and improving PCK of student assistants in introductory physics classes
- Promoting Successful Change in Physics Education and Research.

Workshops and Programs

WORKSHOP FOR NEW PHYSICS AND ASTRONOMY FACULTY

workshop for
new physics and
astronomy faculty

All 2020 workshops were cancelled due to Covid-19

PHYSICS TEACHER RESOURCE AGENTS (AAPT/PTRA) PROGRAM

Workshops were held during the AAPT 2020 Summer Institute. were cancelled due to Covid-19



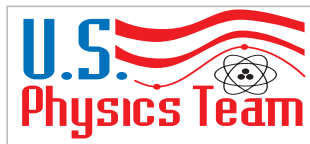
2020 PTRA COMMITTEE

Karen Jo Matsler, Program Director

OVERSIGHT COMMITTEE

Jill Marshall, Chair, Mario Beoni, Christopher J. Chiaverina, Kenric M. Davies, Steven L. Henning, Bob Powell, Ann Robinson, Beth A. Cunningham, Ex Officio, Karen Jo Matsler, Ex Officio, Mark S.

2020 UNITED STATES PHYSICS TEAM



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

The competition for the 2020 United States Physics Team was cancelled due to Covid-19. The 2020 International Physics Olympiad was also cancelled due to the global pandemic.

AAPT PHYSICS BOWL

PHYSICSBOWL

Read more at: www.aapt.org/Programs/contests/physicsbowl.cfm

The 2020 Physics Bowl was cancelled due to Covid-19.

PHYSICSBOWL ADVISORY BOARD

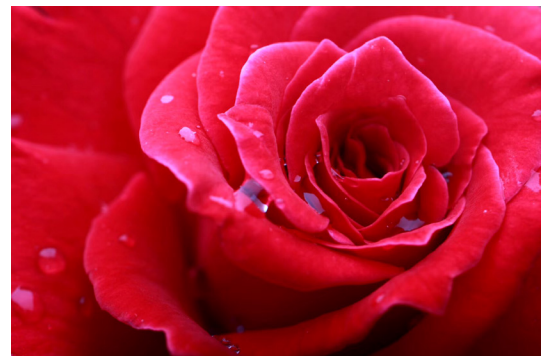
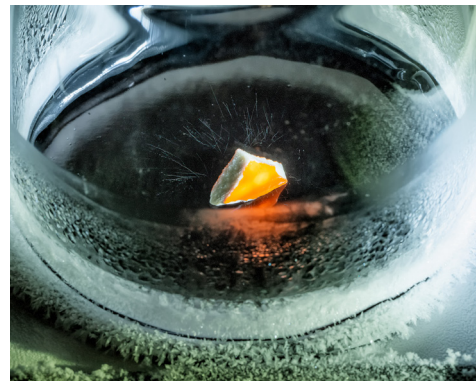
Jon Anderson, Myra West, Michael Bush, Beverly Trina Cannon, Scott Dudley, Sean Flaherty, Thomas Herring, Joel Klammer, Andrzej Sokolowski, Eric Stron, and Courtney Willis

2020 High School Physics Photo Contest

The High School Physics Photo Contest for 2020 was cancelled due to Covid-19. Selected images from the winning photos, 2010-2019 were used to create the 2020 Photo Contest Calendar.



high school physics
photo contest



Collaborative Projects

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.

The 2020 National Teacher of the Year is Bouakham Sriri-Perez of Duncan Polytechnical High School in Fresno, CA. Sriri-Perez was nominated by PhysTEC institution California State University, Fresno, from which she graduated.

Sriri-Perez considers herself “a Lao refugee who achieved her aspirations as a Physics teacher and educational leader.” Her love for learning, strong work ethics, and compassion for others were inspired by her family, which escaped the war-torn country of Laos and lived in Soon Ubon Refugee Camp in Thailand for two years prior to receiving sponsorship to resettle in the United States of America. Her enthusiasm for learning and tenacity to improve the quality of life for her family overshadowed their low socioeconomic background, and the mentors who recognized her potential helped cultivate her journey to becoming an educator. Now, she pays that mentorship forward by promoting Physics education to all her students, hosting student teachers in her classroom, and mentoring new Physics teachers.

Throughout her 20-year career, Sriri-Perez has consistently worked to help students conquer their “phear of physics,” making it instead an accessible and exciting subject. Her efforts allowed her to double the size of the number of physics classes taught at McLane High School. When she started at Duncan, she built the physics program at Duncan Polytechnical High School from ground zero into a subject that is required, appreciated, and well-attended at Duncan.

Sriri-Perez is a champion for physics and physics education, and consistently shows her commitment by gaining funding for her classroom, seeking further training to improve her skills, and recruiting and mentoring student teachers looking to teach physics. Twice in her career, Sriri-Perez successfully wrote proposals that earned her a \$10,000 grant for classroom equipment. She has attended numerous summer institutes to hone her teaching, and she has served as a master teacher for the Fresno Teacher Residency Program and mentored a number of student teachers who have since gone on to be successful teachers themselves.

By all accounts, Sriri-Perez’s advocacy efforts and dedication to continuous improvement are outstanding, yet they are eclipsed by the incredible passion and care she has for her students. Her classroom is a haven, and her intentional and successful efforts to recruit and connect with students of all kinds has encouraged each of them to feel comfortable with physics. Indeed, many of her students go on to study physics at her alma mater, Fresno State.

2020 PHYSTEC CONFERENCE

The 2020 Physics Teacher Education Coalition Conference was held, February 29 - March 1, 2020 in Denver, Colorado at the Sheraton Denver Downtown Hotel. The program included time for networking (both structured and unstructured) and several types of sessions and workshops. The list of session follows.

Plenary sessions:

Advice from the trenches: A panel of physics teachers discusses how they were (or were not) prepared by their teacher education programs.

Physics Teacher Preparation: Helping Not Hurting

State of PhysTEC Address and PhysTEC Awards Ceremony

Workshops and panels

There were 15 workshops and panels available for attendees as well as posters and a Share-a-thon.

After the 2020 PhysTEC Conference, LA Alliance faculty Valerie Otero, Laurie Langdon, Eleanor Close, and Brooke Evans hosted a nuts-and-bolts workshop about running a Learning Assistant program.

The workshop was free for anyone registered for the PhysTEC Conference or the APS March Meeting

2020 Awards and Grants

HANS CHRISTIAN OERSTED MEDAL

David Sokoloff

If Opportunity Doesn't Knock, Build a Door - My Path to Active Dissemination of Active Learning



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.

Sokoloff is Professor of Physics, Emeritus at the University of Oregon. He earned his B.A. at Queens College of the City University of New York and his Ph.D. in AMO Physics at the Massachusetts Institute of Technology. For over three decades, he has studied students' conceptual understandings, and developed active learning approaches (with NSF and FIPSE support). These include Interactive Lecture Demonstrations (ILDs) and the four modules of RealTime Physics: Active Learning Laboratories (RTP), both published by Wiley and co-authored by Priscilla Laws and Ronald Thornton. His work has been published in the American Journal of Physics, the European Journal of Physics, Physical Review, Physics Education Research and The Physics Teacher. He has conducted numerous international and national workshops to disseminate these active learning approaches to secondary and university faculty. Since 2004, he has been a member of the UNESCO Active Learning in Optics and Photonics (ALOP) team, presenting workshops in more than 30 developing countries in Africa, Asia and Latin America. He is contributor to and editor of the ALOP Training Manual. The ALOP Team was awarded the 2011 SPIE Educator Award. He was awarded the American Physical Society (APS) 2010 Excellence in Physics Education Award (with Priscilla Laws and Ronald Thornton) and the American Association of Physics Teachers (AAPT) 2007 Robert A. Millikan Medal. He has been a Fulbright Specialist in Argentina (2011) and Japan (2018), is currently a member of IUPAP Commission 14 (International Commission on Physics Education), and has served in AAPT's Presidential Chain (2009-2012).

The full press release is available at <https://www.aapt.org/aboutaapt/AAPT-Oersted-Medal-for-2020-to-be-awarded-to-David-Sokoloff.cfm>

2020 Melba Newell Phillips Medal Awarded to Richard W. Peterson



Richard W. Peterson, University Professor of Physics – Emeritus, Bethel University, St. Paul, Minnesota
Changed...by a high and noble calling

Peterson has brought to AAPT's executive level leadership a passion for experimental physics and its impact on the lives of students in high school, introductory and advanced laboratories. Following work with the AAPT Apparatus Committee (starting in 1976), he was NSF Principal Investigator for AAPT's Lab Focus-'93 that sought to reinvigorate all physics teaching lab experiences. Later he helped form the AAPT Laboratories Committee with its emphasis on encouraging more effective physics laboratories. While an AAPT leader, he worked with others in the formation of ALPhA (Advanced Laboratory Physics Association) as a charter ALPhA Board member helping organize the first ALPhA national conference (2009) at the University of Michigan. He was recognized with the Jonathan F. Reichert and Barbara Wolff-Reichert Award for Excellence in Advanced Laboratory Instruction in 2017. He served six years on the AAPT Executive Board as Secretary and four years (2003-2007) within the Presidential track - followed by three years as the first AAPT Meetings Committee Chair. His many years of dedicated and creative leadership have had a lasting impact on AAPT, how we do advanced labs as physics faculty, and on the lives of countless students.

He was an undergraduate at the U. of Wisconsin - River Falls, with a Ph.D. in physics earned at Michigan State followed by postdoctoral positions in the Physics Division at Los Alamos. His formative decade in physics teaching was at Western Illinois U., with the last 40 years at Bethel U. In 2006 he was appointed the first University Professor at Bethel University for his research, teaching, and physics community service. He served in a 2010-2012 appointment as a Program Director within NSF's Division of Undergraduate Education (DUE) in Arlington, VA. In 2010 the Optical Society of America (OSA) recognized him as a Senior Member for work in optics, and he has served as a Traveling Lecturer for the OSA. His presentations on lecture demonstrations, advanced laboratories, and undergraduate research include those in S. Korea, N. Korea, China, Latvia, and Kenya.

The full press release is available at <https://www.aapt.org/aboutaapt/Richard-W-Peterson-Recognized-with-AAPT-2020-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.

2020 Awards and Grants (cont.)

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

Deborah Mason-McCaffrey, Salem State University, Salem, Massachusetts
Should Engineers be Teaching Physics?

Deborah Mason-McCaffrey received the 2020 David Halliday and Robert Resnick Award for Excellence in Undergraduate Physics Teaching.

Mason-McCaffrey is Associate Professor, Department of Chemistry and Physics, Salem State University, Salem, Massachusetts. She earned her B.S.M.E. in Mechanical Engineering, with highest distinction, at the University of Rhode Island, her Sc.M. in Solid Mechanics at Brown University, and her Ph.D. in Theoretical & Applied Mechanics at Cornell University.

She is the Chair of the Undergraduate Research Symposium Committee at Salem State, the immediate Past-President of the New England Section of the American Association of Physics Teachers (AAPT), and an AAPT Fellow. Prior to teaching at Salem State, she worked as an engineer in product development and as a department manager at Polaroid Corporation, followed by several years as a consultant and trainer. Mason-McCaffrey's interest is in understanding the link between mathematics preparation and students' conceptual gains in introductory physics.

Read the full press release at: aapt.org/aboutaapt/Deborah-Mason-McCaffrey-to-Receive-the-AAPT-2020-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

James Kakalios, University of Minnesota, Minneapolis, MN
Superheroes and Public Outreach (No Spandex Required)

Kakalios received his PhD in 1985 from the University of Chicago. He is the Taylor Distinguished Professor in the School of Physics and Astronomy at the University of Minnesota, where he has taught since 1988. His scientific research in experimental condensed matter physics concerns the properties of complex and disordered systems. His class "Everything I Needed to Know About Physics I learned from Reading Comic Books" is a popular freshman seminar.

Extensive media coverage of this class in May 2002, in connection with the release of the first Sony Spider-Man film, resulted in hundreds of e-mails from students, teachers and those long out of college, all supporting the concept of using superheroes to teach physics and enquiring about a book based on the class. This led to his writing the popular science book *The Physics of Superheroes* (2005) that has been translated into six languages, and whose Spectacular Second Edition was published in 2009. He is also the author of *The Amazing Story of Quantum Mechanics* (2010) and the recently published *The Physics of Everyday Things* (Crown, 2017).

In 2007, he served as the science consultant for the Warner Bros. superhero film *Watchmen*. He appears on the DVD version of the film in a special feature that discusses some of the science behind one of *Watchmen*'s central characters — Dr. Manhattan. In 2009, Kakalios made a video with the University News Service on "The Science of *Watchmen*," which has been viewed over 1.8 million times and in 2009 won a regional Emmy Award in the "Advanced Media: Arts/Entertainment" category. In 2012, Kakalios served as one of the science consultants for the Marvel Entertainment American superhero film *The Amazing Spider-Man*. A 2018 video for *Business Insider*, where Kakalios discussed the physics underlying 10 Iconic Scenes in Marvel superhero movies has been viewed over 4.2 million times, and another for *Science Insider* on the strength of Spider-Man's webbing has received over 530,000 views.

Read the full press release at: aapt.org/aboutaapt/Kakalios-Named-2020-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.

2020 Awards and Grants (cont.)

ROBERT A. MILLIKAN MEDAL

David M. Cook, Lawrence University, Appleton, Wisconsin
Attempting the (seemingly) Impossible?

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



David M. Cook was the Robert A. Millikan Medal awardee for 2020. Cook is a pioneer in computational physics education and has rendered extraordinary service to AAPT on Area Committees, the Meetings Committee, AAPT representative to AIP Governing Board, and in the Presidential Chain. He has organized a computational physics conference and led computational curriculum education projects. He has been an AAPT member since 1966.

Cook received BS in physics in 1959 from Rensselaer Polytechnic Institute. His AM (1960), and PhD (1965) degrees in physics were both earned at Harvard. In 1965, he joined the Department of Physics at Lawrence University, now a 1500-student liberal arts college in Appleton, WI, advancing from Assistant (1965-71) to Associate (1971-79) to Full (1979) Professor of Physics and to Philetus E. Sawyer Professor of Science (1989), and receiving the Lawrence Excellence in Teaching Award in 1990.

Starting in the early 1980s, he and his colleague, John Brandenberger, committed themselves to building a strong undergraduate department that now has five full-time faculty members, graduates an average of ten physics majors each year, was a case-study department at the 1998 AAPT/APS/AIP revitalization conference, and was included among the exemplary departments reviewed in the SPIN-UP study. Cook retired from full-time teaching and research in June 2008.

Cook was elected Vice-President of the American Association of Physics Teachers, serving successively as Vice-President, President-Elect, President, and Past President. In those roles, he has also served on several AAPT Advisory Committees, as chair of the AAPT Review Board, Awards Committee, and Committee on Governance Structure. and as AAPT representative to the AIP Governing Board, the APS Council, the APS/FEd Nominating Committee, and the APS/FEd Executive Committee. In January 2013, he embarked on a three-year term as chair of the AAPT Meetings Committee.

Read the full press release at: aapt.org/aboutaapt/2020-Millikan-Medal-Awarded-to-David-M-Cook.cfm

THE PAUL W. ZITZEWITZ AWARD FOR EXCELLENCE IN K-12 PHYSICS TEACHING

ESTABLISHED IN 1993 AND FUNDED SINCE 2010 BY A GENEROUS GIFT TO AAPT FROM PAUL W. AND BARBARA S. ZITZEWITZ AND NAMED FOR PAUL W. ZITZEWITZ, THE PRINCIPAL AUTHOR OF THE HIGHLY ACCLAIMED AND WIDELY ADOPTED HIGH SCHOOL PHYSICS TEXT *PHYSICS: PRINCIPLES AND PROBLEMS* AND A LONG-TIME MEMBER AND SUPPORTER OF AAPT, THE PAUL W. ZITZEWITZ AWARD FOR EXCELLENCE IN PRE-COLLEGE PHYSICS TEACHING RECOGNIZES OUTSTANDING ACHIEVEMENT IN TEACHING PRE-COLLEGE PHYSICS.

Ann Walkup, Cranston High School East, Cranston, Rhode Island
Let's All Do Physics!: Integrating Special Education Accommodations in Physics Curriculum

Ann Walkup received the 2020 Paul W. Zitzewitz Award for Excellence in K-12 Physics Teaching. Educated at Connecticut College with a BA in Physics and an MA in Physics Education, she became a life member of AAPT in 2002. Walkup was a member of the Rhode Island Department of Education (RIDE)/ Charles Dana Education Center (University of Texas at Austin) Next Generation of Science Standards science curriculum writing team for six years. She has been instrumental in translating the NGSS into a viable and rigorous physics curriculum for both Cranston Public School Students and the Students of Rhode Island. Her work on curriculum includes the writing of our Foundations for Physics scope and sequence and the units of study. .

Through her impeccable lesson planning and forms of assessment Walkup has helped many students in the Cranston Public Schools acquire the necessary skills to engage in the study of physics. Her dynamic approach to the teaching of physics allows all students from myriad backgrounds to excel in physics

Read the full press release at: aapt.org/aboutaapt/Ann-Walkup-to-Receive-2020-Zitzewitz-Award.cfm



2020 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



Douglas Brown is Physics Professor Emeritus, Cabrillo College, Aptos, California. In retirement, he continues to actively support Tracker, the free video analysis and modeling tool he developed as part of the Open Source Physics project. A member of AAPT since 1991, he has been recognized for teaching excellence and served as department chair at Cabrillo. He is currently a resource editor for the Tracker collection in the ComPADRE digital library. Tracker is widely used in the physics community with over 1 million downloads. It has been translated into 26 languages and it is regularly cited in *The Physics Teacher*, with 81 citations for the original 2009 Tracker paper (Vol 47, p 145)... <https://www.aapt.org/aboutaapt/Douglas-Brown-Recognized-as-a-2020-Recipient-Dodge-Citation-for-Distinguished-Service-to-AAPT.cfm>



Dan Burns taught Advanced Placement Physics and Earth/Space Science at Los Gatos High School in Los Gatos, California for 27 years. He is currently the physics curriculum and training specialist at PASCO scientific in Roseville, CA. An active member of AAPT since 1994, Burns is an active member of the Northern California/Nevada AAPT Section and has served as President of the Section. He conducts the PTSOS workshop program, now in its 16th year. Burns has also taught workshops and wrote curriculum for many different organizations including Lawrence Livermore National Laboratory, USGS, the SETI Institute, and the National Math and Science Initiative. <https://www.aapt.org/aboutaapt/Dan-Burns-2020-Recipient-of-the-Homer-L-Dodge-Citation.cfm>

AAPT 2020 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 2020 recipients of the AAPT Fellows Award were:

Jose D'Arruda, University of North Carolina Pembroke, Pembroke, NC
Dan Burns, Los Gatos High School, Los Gatos, CA

2020 Awards and Grants (cont.)

DOC BROWN FUTURES AWARD

Established in 2018 by the AAPT Board of Directors and endowed in 2019 by Robert “Doc” Brown

The Doc Brown Futures Award 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.

The recipient of the 2020 Doc Brown Futures Award was Kenric Davies. He had the honor of being the first recipient of this new award. The award was presented during the 2021 Virtual Winter Meeting.

A member of AAPT since 2010, Davies teaches Advanced Placement Physics at Liberty High School in Frisco, TX. He has been a consistent contributor to Texas Section (TS) AAPT meetings and events. He has made numerous oral presentations and workshop presentations. He has been and continues to be a valued contributor to physics and physics education in Texas. He has served in a leadership role in Texas Section AAPT, running for the Texas Section AAPT Council as the High School Member at Large in spring 2018 and has served in this position since the Fall 2018 meeting exhibiting a high level of professional conduct and professional interest that has improved the TS AAPT Council.

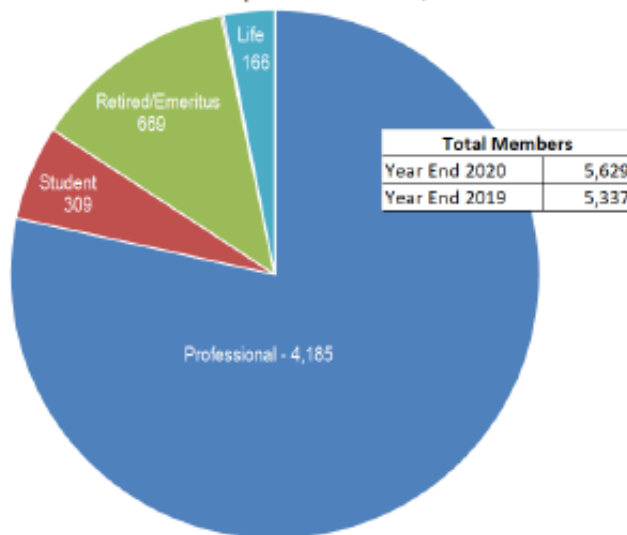
As the elected high school representative, Davies has been the section liaison to the Science Teachers Association of Texas (STAT). He has organized the physics strand of presentations and workshop at the STAT annual fall meeting, known as the Conference for the Advancement of Science Teaching (CAST) which attracts between 5,000 to 8,000 teachers to the conference. This physics strand includes two to three days of workshops for K-12 teachers. He has recently been asked to fill a vacancy on the STAT Executive board as a Member at Large as well; starting a two year term on June 1, 2020. His contribution to TS AAPT includes helping create the biannual newsletter. Not only does he write the high school column, he helped setup the interactive portions of the newsletter. Additionally, he has worked with the TS AAPT president to solicit sponsors for the TS AAPT annual Excellence in Pre-College Physics Teaching Award.



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, 2020)

MEMBERSHIP BY MEMBER TYPE





DIVERSITY, EQUITY, AND INCLUSION AT AAPT

This new section describes AAPT activities around diversity, equity, and inclusion (DEI) that occurred in 2020. The year was challenging for AAPT members because of the COVID-19 pandemic transforming the way students were educated and also the issues of

justice that were brought forward after the deaths of George Floyd, Ahmaud Abery, and Breonna Taylor. AAPT leadership, in strong partnership with the Committee on Diversity in Physics (CoDP), confronted these issues and supported AAPT members

during these trying times. The list below highlights some of these activities. The CoDP annual report includes other activities the committee engaged in during 2020.

Two statements Released:

- AAPT Statement Against Racism and Violence, June 3, 2020, condemning the killings spurred by anti-Black racism and outlining an action plan for AAPT fighting against systemic racism.
- CoDP Statement on Violence and Racism Against Black People, June 5, 2020, condemning racial violence against Black people and includes an action plan to combat the effects of systemic racism.

External Funding Received or Active During 2020:

- AAPT in partnership with the National Society of Black Physicists and the National Society of Hispanic Physicists applied for and received a diversity grant from the American Institute of Physics to conduct a series of virtual workshops to examine and improve inclusive curriculum in physics. The workshop series will be held virtually in 2021.
- AAPT received a grant from the National Science Foundation (1938815) to support the U.S. Delegation to the IUPAP International Conference on Women in Physics and the special project associated with the Delegation that will create a virtual workshop focused on how women in astronomy and physics can effectively communicate science.
- The Physics & Astronomy SEA Change project, funded by the AIP Venture Partnership Fund and in collaboration with a number of other physics and astronomy professional societies including AAPT and AAAS, hired a project manager Alexis Knaub. Alexis is an active AAPT member and is Vice Chair of the Committee on Diversity in Physics in 2020. This project aims to support Physics and Astronomy departments in the US to improve their efforts around equity, diversity, and inclusion. Five departments were recruited to participate in the first cohort of the project.
- The eAlliance project funded by the National Science Foundation (1500529) continued to support women in physics and astronomy departments at institutions of higher education. This was especially important during the pandemic since many women faced additional challenges including additional childcare responsibilities. The co-principal investigators initiated a project to better understand the issues that women in physics and astronomy departments face during the pandemic. The results of this project will be available in 2022.

Virtual Coffee Hour

- Immediately following the transition to remote learning, AAPT began hosting virtual coffee hours for members to discuss virtual student learning. The following coffee hours focused on DEI.
- The CoDP Chair and Vice Chair, along with Zahra Hazari (Associate Professor of Department of Teaching and Learning and affiliate faculty in Physics, Florida International University) hosted a virtual coffee hour on June 30th and invited members of the physics education community to reflect on and discuss marginalization.
- The November 10th coffee hour was hosted by Alexis Knaub and the topic was the Physics & Astronomy SEA Change project.

AAPT Sections - DEI Survey

- Every section of AAPT responded to a survey on which DEI practices that have been introduced at national AAPT meetings have been adopted at the local level. This is a repeat of an earlier survey, and the intent is to keep taking longitudinal data to see how the implementation evolves.

National Meetings:

- WM20 included the Multicultural and Members and Supports of LGBTQ Community meetup.
- WM20 had a lactation room for mothers with young children.
- WM20 - The meeting started with a land acknowledgement and performance by the Sacred Thunder Drum and Native Insights.
- WM20 - A series of DEI workshops on inclusive communication and communicating across differences was available to all attendees.
- SM20 - The meeting included a virtual land acknowledgement, “Voices of Women” panel, and the following meetups: Member and Supports of LGBTQ Community, International, and Disability
- SM20 - diversity plenary session with Dr. Mildred Boveda, Assistant Professor of Special Education and Cultural Linguistic Diversity at Arizona State University Mary Lou Fulton Teachers College. Dr. Boveda’s talk was on “Intersectionality and Transdisciplinarity in Physics Education.” The CoDP Chair and Vice Chair moderated this plenary.

- SM20 - The plenary session “STEP UP: A Social Movement to Promote Cultural Change in Physics” was led by Zahra Hazari, Florida International University with Bree Barnett Dreyfuss, Amador Valley High School, Colleen Epler-Ruths, Shikellamy High School, Brian Kays, Ramona Convent Secondary School, John Metzler, Niles West High School, and Laura Sloma, East Kentwood High School and Freshman Campus, as participating speakers.
- SM20 - CoDP hosted the first DEI virtual room during SM20 on the following topics: the TEAM-UP report, the Physics and Astronomy SEA Change project, a post-plenary discussion on Dr. Boveda’s talk, and the APS LGBTQ+ Climate in Physics Report, Black science fiction writing, DEI in high school (hosted in the K-12 Resource Room), climate for women in physics, anti-racist reading discussion, climate for science learners with disabilities, and a discussion on what AAPT can do to support anti-racism, anti-oppressive physics learning spaces.

Publications

- *The Physics Teacher* published a theme issue on Sex and Gender which was published in May 2020.
- A new diversity column in *The Physics Teacher* was initiated with the search for an editor.

The American Association of Physics Teachers thanks these generous corporate partners for their support of 2020 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.

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AAPT Physics Education Funds

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



AAPT 2020 Section Representatives

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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Holsenbeck

ALASKA SECTION

No representative

ALBERTA SECTION

Terry Singleton

APPALACHIAN SECTION

John C. Stewart

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Tania Entwistle

LOUISIANA SECTION

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Genaro Zavala

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MISSISSIPPI SECTION

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A. James Mallmann

THE AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC.

AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC. STATEMENT OF FINANCIAL POSITION AS OF DECEMBER 31, 2020

ASSETS		2020
CURRENT ASSETS		
Cash and equivalents		\$ 1,075,497
Investments		941,442
Accounts receivable		335,512
Grants receivable		910,518
Inventory		4,591
Prepaid expenses		43,627
Total current assets		<u>3,311,187</u>
FIXED ASSETS		
Equipment		89,135
Capital lease		12,500
Software		192,159
		<u>293,794</u>
Less: Accumulated depreciation and amortization		(250,377)
Net fixed assets		<u>43,416</u>
OTHER ASSETS		
Investments, net of current portion		7,383,000
Investment in ACP		1,377,333
Deposit		1,000
Total other assets		<u>8,761,333</u>
TOTAL ASSETS		<u><u>12,115,936</u></u>
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Capital lease obligation		2,452
Accounts payable and accrued liabilities		369,136
Accrued payroll and related liabilities		217,261
Accrued postretirement benefit obligation		27,036
Unearned revenue current portion		1,489,918
Total current liabilities		<u>2,105,803</u>

AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC.
STATEMENT OF FINANCIAL POSITION AS OF DECEMBER 31, 2020

LONG-TERM LIABILITIES

Unearned revenue long term portion	60,178
Capital lease obligation, net of current portion	6,025
Accrued postretirement benefit obligation	491,988
Total long-term liabilities	558,191

Total liabilities	2,663,994
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NET ASSETS

Without donor restrictions:

Undesignated	6,198,450
Board designated	1,541,189

Total without donor restrictions	7,739,639
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With donor restrictions	1,712,303
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Total net assets	9,451,942
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TOTAL LIABILITIES AND NET ASSETS	\$ 12,115,936
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See accompanying notes to financial statements

AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC.
STATEMENT OF ACTIVITIES AND CHANGE IN NET ASSETS
FOR THE YEAR ENDED DECEMBER 31, 2020

	Without Donor Restrictions	With Donor Restrictions	Total
REVENUE AND SUPPORT			
American Journal of Physics	\$ 1,521,837	\$ -	\$ 1,521,837
The Physics Teacher	918,107	-	918,107
Membership	625,760	-	625,760
Meetings, Workshops, and Programs	492,634	-	492,634
Grants	1,242,719	-	1,242,719
Investment income (loss), net	746,192	208,758	954,950
Other Publications	6,641	-	6,641
International Physics Olympiad	130,156	-	130,156
Earnings on investment in ACP	126,010	-	126,010
Contributions	19,101	61,678	80,779
Miscellaneous income	4,454	-	4,454
Net assets released from donor restrictions	71,407	(71,407)	-
Total revenue and support	5,905,017	199,029	6,104,047
EXPENSES			
Program Services:			
American Journal of Physics	198,363	-	198,363
The Physics Teacher	374,334	-	374,334
Membership	426,651	-	426,651
Meetings, Workshops, and Programs	1,020,427	-	1,020,427
Grants	788,864	-	788,864
Other Publications	267,837	-	267,837
Total program services	3,076,476	-	3,076,476
Supporting Services:			
General and Administrative	1,630,184	-	1,630,184
Fundraising	313	-	313
Total supporting services	1,630,497	-	1,630,497
Total expenses	4,706,974	-	4,706,974
Change in net assets before other items	1,197,969	199,104	1,397,073
OTHER ITEMS			
Other components of net periodic benefit cost	(27,391)	-	(27,391)
Benefit-related changes other than net periodic benefit cost	(76,151)	-	(76,151)
Change in net assets	1,094,427	199,104	1,293,531
Net assets at beginning of year	6,651,349	1,507,063	8,158,412
NET ASSETS AT END OF YEAR	\$ 7,745,851	\$ 1,706,092	\$ 9,451,942

AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC.
STATEMENT OF FUNCTIONAL EXPENSES
FOR THE YEAR ENDED DECEMBER 31, 2020

	Program Services						Total Program Services
	American Journal of Physics	The Physics Teacher	Membership	Meetings, Workshops, and Programs	Grants	Other Publications	
Compensation	\$ 250	\$ 320,600	\$ 309,830	\$ 574,983	\$ 310,113	\$ 253,544	\$ 1,769,341
Consultants, contracts and temporary	-	-	8,500	28,688	261,922	-	299,110
Rent	-	22,613	33,330	55,548	-	10,717	122,208
Computer supplies and maintenance	3,000	2,706	9,775	6,536	15,917	329	38,263
Editorial office	160,956	3,000	-	-	-	-	163,956
Travel	-	1,328	5,940	88,069	9,894	1,938	107,169
Materials and supplies	-	112	4,321	115,494	275	-	120,201
Indirect Cost	-	-	-	-	94,976	-	94,976
Participant support	-	-	-	6,434	83,977	-	90,411
Dues and memberships	293	368	42,275	-	-	-	42,935
Conferences, meetings and workshops	-	-	986	26,669	6,561	1,200	35,415
Audio Visual	-	-	-	42,735	-	-	42,735
Depreciation and amortization	-	-	-	-	-	-	-
Bank fees	-	-	-	60	-	-	60
Honoraria	19,000	7,500	500	5,350	-	-	32,350
Publications	14,742	15,824	-	31	-	50	30,647
Awards	-	-	632	24,487	-	-	25,119
Professional fees	-	-	-	-	-	-	-
Exhibit and meeting expenses	-	-	2,294	20,808	-	-	23,102
Postage, packing and shipping	122	262	3,595	13,339	90	59	17,466
Office services	-	-	-	-	-	-	-
Insurance	-	-	-	-	-	-	-
Advertising	-	-	2,173	7,883	1,200	-	11,256
Photocopying and printing	-	11	991	3,315	1,851	-	6,168
Publishing services	-	-	1,500	-	2,088	-	3,588
Bad debt expense	-	-	-	-	-	-	-
TOTAL	\$ 198,363	\$ 374,334	\$ 426,651	\$ 1,020,427	\$ 788,864	\$ 267,837	\$ 3,076,476

2020 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.*

Curtis Hieggelke

JANUARY 1, 2020

Dr. Curtis J. Hieggelke Hall of Fame community college teacher and AAPT TYC leader, died January 1, 2020 at the age of 78. A physicist, Hieggelke was selected for the Joliet Junior College Susan H. Wood Hall of Fame Award in 2012, capping off a forty-two-year career as a pioneering educator, including more than thirty years teaching at JJC. An early adopter of technology on both the personal and professional level—he co-founded the Illinois Macintosh Users Group (IMUG) in 1985, just a year after Apple launched it. Hieggelke was awarded the AAPT Homer L. Dodge Distinguished Service Citation (1994) and was an AAPT Fellow (2014). He also serviced on the AAPT board as the Two-Year College Representative.

Carl Curtis Duzen

APRIL 16, 2020

In 1975, Carl Curtis Duzen was an exchange teacher from California and landed at Lower Merion High School, a sister school to Harrington High School, where I was teaching. Carl and I met during a Southeastern Pennsylvania AAPT Section meeting that fall where Carl had become the section representative. It was friendship at first sight. Carl stayed in Pennsylvania and later died there on April 16, 2020. Carl was an exceptionally accomplished physics teacher. He loved teaching, he loved his students and he loved physics. With a twinkle in his eye, he would share that he had taught Koby Bryant about projectile motion. His lessons were always clear, correct, and often wrapped in a bit of humor. To share his experience and knowledge, Carl got me involved in traveling around the state doing workshops for fellow teachers as part of the AAPT/PTRA program. Carl was also an accomplished practitioner of the culinary arts, and friends enjoyed many meals at his home. One of his delightful dinners, was featured in the Philadelphia Inquirer. In recent years, Carl has suffered from Alzheimer's. But true to his character, as his "work" he started recycling the copper from discarded electronic equipment. When Carl fashioned artistic forms with the copper, Susan Jewett, Carl's wife, as an artist, recognized the beauty of his forms and became his framer and collaborator.

Lillian Christie McDermott

JULY 13, 2020

It is with deep sadness that we inform you of the passing of Lillian Christie McDermott. Lillian died in her own home, from natural causes associated with cancer. She left life as she lived it: graciously and surrounded by her family. She is predeceased by her husband, Mark McDermott, and survived by her three children, Bruce (Tina), Melanie (David), and Connie, and four grandchildren.

Lillian grew up in NYC. She attended Vassar College, initially on a music scholarship, and eventually majored in physics. She often attributed her women's-college experience with allowing her interest in physics to blossom unfettered. She earned a PhD from Columbia University, with a specialization in experimental nuclear physics. She moved to Seattle with Mark when he joined the physics faculty of the University of Washington,

where she was barred from employment due to anti-nepotism rules. After working as an instructor at nearby Seattle University, she volunteered with Arnold Arons, then at UW. Lillian and Arnold formed a close and productive professional relationship that eventually - once the anti-nepotism rules were struck down - led to her joining the faculty at the UW and founding the Physics Education Group (UW PEG). The UW PEG was the first organized Physics Education Research group to provide access to a PhD in physics for physics education research.

The field of PER rests on the foundation that Lillian helped build. Her pioneering research continues to be influential to this day. She spent years proselytizing and pushing the community around her to be better. Lillian was a highly effective champion for the role of PER in physics departments. She was driven, tireless, and tenacious. She was also generous with her time, and a wise and supportive mentor to countless scholars, teachers and students around the world.

Lillian was a Fellow of the American Association for the Advancement of Science and of the American Physical Society. Among her most significant awards are the 2002 Medal of the International Commission of Physics Education (International Union of Pure and Applied Physics), 2001 Oersted Medal of the American Association of Physics Teachers (the highest award of the AAPT), the 2000 Education Research Award of the Council of Scientific Society Presidents, and the 1990 Millikan Lecture Award of the AAPT. The American Physical Society selected the UW PEG as the recipient of the 2008 Excellence in Education Award.

In addition to her exceptional scholarly achievements, Lillian was also a role model in an era that so desperately needed them. She was a widely-respected physicist who also chose to be a mother and raise children. Her tenacity was built through adversity in an era unwelcoming to women in physics. In accordance with the high value Lillian placed on in-person human interaction, a memorial will be organized when people are able to gather in person to honor her memory.

Paula Heron, Peter Shaffer, Donna Messina and Suzanne White Brahmia for the UW PEG

Charlie Reno

SEPTEMBER 1, 2020

Charles was born on December 21, 1939 and died on August 25, 2020. He joined AAPT in 1991 and was actively involved in the Ohio Section of AAPT. He has served as Treasurer of the Ohio Section since 2001.

Reno educated and influenced many young minds as a dynamic and dedicated teacher at Euclid High School, Hawken Upper School, and Cleveland State University. He conducted many teaching workshops for Texas Instruments and also was a Physics Teaching Resource Agent. Reno especially enjoyed correcting Advanced Placement exams for many years. He loved traveling with family, geocaching, amateur radio, Farm Town, and playing with his grandchildren.

John S. Rigden

AUGUST 19, 2020

John S. Rigden was born in Painesville, Ohio, on January 10, 1934, and died of cardiac arrest at St. Luke's Hospital in St. Louis, Missouri, on November 24, 2017, at age 83. He is survived by his wife Diana of thirty-



two years, his first wife Dorothy, six children, nineteen grandchildren, and eleven great-grandchildren. Interment was at Oak Hill Cemetery in Kirkwood, Missouri.

John received his B.S. cum laude from Eastern Nazarene College in Quincy, Massachusetts, in 1956 and his Ph.D. in Physics from The Johns Hopkins University in 1960. He was a Post-Doctoral Research Fellow at Harvard University (1960-61) and returned to Eastern Nazarene College as Assistant and Associate Professor of Physics (1961-67). He then was a Staff Physicist on Harvard Project Physics (1966-67). He returned to academia as Associate Professor of Physics at Middlebury College (1967-68) and then rose from Associate to Full Professor of Physics at the University of Missouri in St. Louis (1968-90), serving as Chairman of the Department of Physics for three years (1975-78). He spent a year as a Visiting Scholar in the Department of Physics at Harvard University (1982-83). He left academia to become Director of Physics Programs (1987-97) and Director of Special Projects (1997-2003) at the American Institute of Physics in New York and College Park, Maryland. He took a leave in 1992 to become Director of the National Science Education Standards at the National Academy of Sciences. He was appointed Honorary Professor of Physics at Washington University in St. Louis in 2003.

John recognized early in his career that his deepest intellectual interests lay in the educational, cultural, and historical aspects of physics and in communicating them to teachers, students, and the public. He was an early riser, hard worker, and loved to write. He published over two dozen papers in refereed journals and over seventy invited papers and other contributions in journals, magazines, and newspapers. He also wrote four outstanding scholarly books:

- *Physics and the Sound of Music* (John Wiley, 1977; 2nd edition, 1985)
- *Rabi: Scientist and Citizen* (Basic Books, 1987; Harvard University Press, 2000, with a new Preface). He published five related historical articles on Rabi, space quantization, and nuclear magnetic resonance.
- *Hydrogen: The Essential Element* (Harvard University Press, 2002); translated into Japanese and Korean. It was named as one of the 20 best science books in 2002 by Discover magazine. He also published two related historical articles.
- *Einstein, 1905: The Standard of Greatness* (Harvard University Press, 2005); translated into Chinese, Japanese, and Korean. It was widely and enthusiastically received.

He co-edited two books: *Most of the Good Stuff: Memories of Richard Feynman* (Springer-Verlag 1993), for which he also wrote one of its chapters, and *Physics in the Twentieth Century* (Harry N. Abrams 1999) on the centennial of the American Physical Society, for which he selected many of its pictures. He also was Editor-in Chief of the four-volume *Encyclopedia of Physics* (Macmillan 1996) and of the *Encyclopedia of Elementary Particle Physics* (Macmillan 2003).

Most significantly, John served as Editor of the *American Journal of Physics* for ten years (1978-88), for which he wrote 100 timely Editorials and oversaw the publication of many historical and cultural articles. The American Association of Physics Teachers recognized his extraordinary contributions by awarding him a Distinguished Service Citation in 1989.

John also co-founded and co-edited (with me) the journal *Physics in Perspective* for 15 years (1999-2013), for which he wrote 34 Editorials and 7 Book Notes. Perhaps the most remarkable endorsement we received was that a Harvard librarian told us that this was the most read journal in his library and hence the most stolen one, so he had to keep it in his office for safekeeping.

John was a brilliant and captivating lecturer, which brought him over 200 invitations to speak on historical, educational, and physical topics at colleges, universities, and conferences in the United States, Canada, Mexico, Germany, Egypt, Israel, Sweden, and Italy. He thus became an ambassador of good will for the United States, as he was when he served as consultant to physics educational projects in India (1968-69, 1991), Malaysia (1970), and Japan (1971), and when he was a Fulbright Fellow in Burma (1971) and Uruguay (1975).

John was elected a Fellow of the American Association for the Advancement of Science in 1989, and a Fellow of the American Physical Society in 1998, "In recognition of his distinguished historical research, and his devotion to the advancement of physics through education, administration, and public service." He received the Robert A. Millikan Award of the American Association of Physics Teacher in 2005, "For his many innovative and creative contributions to the teaching and history of physics." He received the Andrew Gemant Award of the American Institute of Physics in 2008, "For a lifetime of enlightenment of physicists and the public. As a teacher, researcher, scholar, writer and editor, he has been an Ambassador of good will for the physics community par excellence."

Uri Haber-Schaim

OCTOBER 23, 2020

Uri Haber-Schaim, a leader in science education for nearly half a century, died September 16, 2020 in his home in Jerusalem, Israel, at the age of 94. He is survived by his wife of 73 years, Shlomith, two daughters, a son, and three grandchildren.

Uri was the 1970 recipient of the Oersted Medal given by the American Association of Physics Teachers for "outstanding, widespread, and lasting impact on the teaching of physics." On behalf of the Physical Science Study Committee, he received in 2007 the first award given by the American Physical Society for Excellence in Physics Education: "For the revitalization of subject matter through the involvement of teachers and researchers at all levels, the elevation of the instructional role of the laboratory, the development and utilization of innovative instructional media, and the emphasis on discipline-centered inquiry and the nature of physics, PSSC Physics has had a major and ongoing influence on physics education at the national level." Uri Haber-Schaim was born in Berlin in 1926 and immigrated with his family to Rehovot, Palestine in 1933. He received his M.Sc. in physics from the Hebrew University of Jerusalem in 1949, under the supervision of Giulio Racah, and his Ph.D. from the University of Chicago in 1951, under the supervision of Enrico Fermi. His thesis was on the high energy spectrum of cosmic ray primary nucleons. In 1956, after holding short-term positions at the Weizmann Institute of Science, the University of Bern, and the University of Illinois at Urbana, Uri took a position at MIT as assistant professor of physics.

A summer job in 1957 as director of the Wave Optics Group with the newly formed Physical Science Study Committee (PSSC), ignited his passion for science educational reform. He continued to work with PSSC, leaving MIT in 1961 with his decision to shift from a career in high energy physics to one in science education.

Uri was involved in developing almost all aspects of the PSSC curriculum: textbook, teacher's guide, tests and more. He directed the Laboratory Group, which designed the labs, developed equipment kits and wrote the lab guide. When PSSC Physics came under free license after the second edition, Uri took up the challenge to develop and prepare the subsequent editions, first as director of the Physical Science Group and then as director of its successor, the Institute for Curriculum Development in Science and Mathematics at Boston University.



PSSC Physics went through seven editions – the first one came out in 1960, the last in 1991 – and was ultimately translated into 17 languages. Ten years after the formation of PSSC, more than half the high school student taking physics in the United States were using the course in its entirety, while others were exposed to some of the materials. Later revisions provided students with a more up-to-date introduction to optics and quantum physics. As Uri recalled: “[The spirit and substance of the course] reflected the original intentions: The unity of physics, the sense of development, models, predictions - all were there. To convey the spirit of science, the text was written in a narrative style, which demanded that the students follow the development of ideas rather than look for a brief statement of a law... The way in which the laboratory work was used was also new for American students in the early 1960s. Gone was the cookbook with its detailed instructions and ready-to-fill tables. With economically designed equipment, the lab became the place where the entire class could converse with nature and try to recognize its regularities.”

Convinced of the advantages of studying the physical sciences in junior high school, Uri’s group developed and prepared the laboratory-oriented one-year course for 8th and 9th grades, Introductory Physical Science (IPS). The course dealt with the basic properties of matter and led to the development of the atomic model of matter. The second-year continuation of the course, Physical Science II (PSII), was later revised as Energy: A Sequel to IPS. The first commercial edition of IPS was published in 1967, the ninth, in 2010. IPS became so widely used that much of the introductory material it covered was eliminated from PSSC Physics by the third edition.

In addition to directing and taking part in the creation, evaluation, and revision of curriculum materials and equipment, Uri was concerned with expanding the ranks of qualified science teachers. He designed teacher-training programs and conducted workshops and institutes all over the United States and in many other countries, from Chile to Japan.

Uri loved music and had two grand pianos in his home in Belmont, MA, where he frequently played chamber music with friends. He conducted the Belmont Orchestra for many years, and recorded an album of Schubert piano duos.

Uri once wrote in memoriam to a friend: “Life is a succession of accidental events interspersed with the exercise of free will.” Throughout his lifetime, Uri made the most of both.

