



Fall 2020 Newsletter

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From the Chair

Gerald Feldman, George Washington University

A lot has happened over the past six months, and much of it is not what we would have expected back in March of this year! Most of us had finished our spring semesters in an online mode of instruction, and for many of us, that approach has also been imposed for the current fall semester. At this point, I hope that you are all safe and healthy and are balancing the various demands on your time and energy. With your dedication to education and to our broader community, I trust that you are continuing to manage your various academic pursuits.

The activities of the Forum on Education culminate in the Fall season, when we recognize our members for their distinguished contributions to the promotion and enhancement of Physics Education. This includes two APS awards, as well as the privilege of bestowing the honor of APS Fellowship status to specific individual members. The two FEd awards are outlined below:

Reichert Award for Advanced Laboratory Instruction

To recognize and honor outstanding achievement in teaching, sustaining (for at least four years), and enhancing an advanced undergraduate laboratory course or courses at U.S. institutions.

Excellence in Physics Education Award

To recognize and honor a team or group of individuals (such as a collaboration) or, exceptionally, a single individual, who have exhibited a sustained commitment to excellence in physics education.

The awardees for these two FEd honors have already been announced, and so we are very happy to be able to present them to you here in the Newsletter. If you want more details about these awards or more information about the recipients, please check out the APS honors website that is listed here:

<https://www.aps.org/programs/honors/listings.cfm>

The Reichert Award for Advanced Laboratory Instruction goes to Linda Barton (Rochester Institute of Technology). Her citation reads: “For dedicated and sustained development of the college junior year physics laboratory course sequence, for notable contributions to pedagogical approaches and materials in support of advanced labs in the physics curriculum, and for instilling a passion for experimental physics in students.”

The Excellence in Physics Education Award goes to Anderson Sunda-Meya (Xavier University of Louisiana). His citation reads: “For multifaceted support and inspiration to students and faculty at Xavier University of Louisiana, robust physics outreach to the New Orleans region, and sustained commitment to recruiting, retaining, mentoring, teaching, incorporating service learning, and conducting research with African American physics students.”

For the Fellowship nominations by FEd, we are very proud to announce the names and citations for five new APS Fellows in 2020. This is the largest group of FEd APS Fellows since 2010, and we are pleased to present them to the FEd community.

Geraldine Cochran (Rutgers University)

Citation: “For scholarly advocacy around equitable access that pushes the boundaries of physics education, especially for Black women and women from other minoritized and marginalized ethnicities, for advancing research on racial justice in physics education, leading to deeper understanding of structures of power.”

Scott Franklin (Rochester Institute of Technology)

Citation: “For decades of work to support emerging and diverse scholars in physics education research and to foster a vibrant and sustained PER community.”

Laura Henriques (California State University, Long Beach)

Citation: “For many significant contributions to PhysTEC as a site lead, architect of a regional network, National Advisory Board member, and mentor for the new regional network as well as for service to the American Physical Society in various educational initiatives.”

Suzanne Amador Kane (Haverford College)

Citation: “For the groundbreaking development of undergraduate curricula in medical and biological physics, and dissemination of innovative teaching in publications, talks, and popular media; and for research mentorship which is a model for endowing students with a superb, interdisciplinary skill set.”

Jonathan Reichert (TeachSpin Inc.)

Citation: “For great contributions to hands-on advanced lab instruction, first as a professor for over three decades, then by initiating and supporting many vehicles for broad dissemination of teaching materials and equipment, directly impacting more than 85 percent of all physics degree-granting programs in the U.S.”

In addition, FEd works closely with the APS Committee on Education (COE), and the Prize for a Faculty Member for Research in an Undergraduate Institution is awarded through COE. This year, I was serving on that selection committee for the first time, and I must say that the range of amazing faculty members at a variety of undergraduate colleges and universities was truly impressive. The recipient of this APS prize for the coming year was Gordon Jones (Hamilton College) and his citation reads: “For outstanding contributions to fundamental neutron physics, development of neutron polarizers using optically polarized helium-3, and extraordinary engagement and education of undergraduate students.”

We congratulate both of our FEd award winners, the COE prize winner, and our five new APS Fellows, and we are very glad to be able to recognize all your considerable accomplishments! For all of members in the Forum on Education, please keep in mind that the nominations for these APS honors come from you, and so we ask you to think about your own colleagues and collaborators who might be very deserving nominees in the future.

In the previous edition of the FEd Newsletter, we mentioned a novel program that we initiated in June of this year in which we solicited proposals for FEd Minigrants. The idea was to provide some limited funds to individuals or small groups who wanted to pursue a short-term project. The rationale for this opportunity came out of discussions in the FEd Executive Committee regarding potential uses of uncommitted funds for this year due to limited travel and conference programs. The solicitation and evaluation procedures for this program were headed by Laura Rios, our FEd Secretary/Treasurer, and we received quite a number of proposals throughout June and July. In the end, we were able to disburse over \$35,000 in funds from our FEd budget, distributed among 21 separate proposers.

As far as the immediate future is concerned, we would like to remind everyone that the elections are coming up this month for FEd officers and the Executive Committee members. Eric Brewe has compiled an impressive slate of candidates for these positions, and so when you receive the notification from APS that the election is open, please go in and cast your vote! I realize that all of us have our minds on voting this fall, in general, so please get

some practice in electoral procedures by exercising your right to vote for the elected positions of the Forum on Education.

All of you know that FEd sponsors or co-sponsors many education-related sessions at the March and April APS meetings in the spring. It has already been announced that the March meeting will be 100% virtual, and at the moment, APS is holding two options open (virtual or hybrid) for the April meeting. In any case, Catherine Crouch has been working hard to organize our FEd sessions for these meetings, and so we hope that all of you will plan to attend one (or both!) of these spring meetings. The virtual meeting format functioned relatively well for this past year's April meeting, and so the APS leadership and staff have lots of experience by now. And we can assure you that Catherine is arranging a broad range of interesting sessions for the spring, so please keep an eye out for further notifications related to the March and April meetings.

In closing, I wish for all of you continued success during this semester, under the still unusual circumstances in which we find ourselves. We look forward to the day, sometime in the not-too-distant future, when we will be able to return to in-person meetings and conferences. As always, the Forum on Education welcomes your input and opinions, and we hope that our current members can help attract new members to FEd over the coming year. Please remember that joining APS Forums is free – such memberships do not affect your annual APS dues at all. We can potentially have more influence in education policies and programs within APS if our unit has substantial support from the broader APS membership by joining FEd. ■

Award Winners and FEd Sessions at the March and April Meetings

Catherine Crouch, Chair-Elect

The Forum on Education is sponsoring many great invited sessions at the upcoming March and April meetings. Both meetings will be entirely virtual. We encourage FEd members to attend the sessions and invite their colleagues too. One big advantage of the virtual meeting format is that if you have a conflict with a session, you can watch the recording later!

At the March meeting, FEd is sponsoring or co-sponsoring four sessions. One is the Reichert Excellence in Advanced Laboratory Instruction Award session, featuring both the 2021 winner, Linda Barton of Rochester Institute of Technology, and the 2020 winner, Enrique Galvez of Colgate University, as the 2020 March Meeting was cancelled due to COVID-19.

The other March meeting invited sessions include a session on inclusive practices for physics programs; teaching computation and data science (joint with GDS); and physics and careers of physicists responding to COVID-19 (with DBIO).

At the April meeting, FEd is sponsoring or co-sponsoring six ses-

sions, many on similar topics to the March meeting sessions due their importance and timeliness. One is the Excellence in Physics Education Award session, this year honoring Dr. Anderson Sunda-Meya of Xavier University for work recruiting and mentoring African-American students into physics careers. The session will also include presentations on the APS National Mentoring Community and Bridge Program initiatives.

The other April meeting sessions include two sessions on remote teaching, one focused on labs (joint with AAPT) and one on other areas (joint with GPER); one session features strategies for inclusive teaching (again joint with AAPT), another session offers resources for teaching computation; and one session addresses physics recruitment programs for high school students (joint with DNP and featuring a couple of summer programs that specifically recruit students into nuclear physics and medical physics). ■

Education Groups In APS

Laurie McNeil (Fed Past Chair), Jerry Feldman (Fed Chair), and Catherine Crouch (Fed Chair-Elect)

Part of the mission of the APS is “to promote effective physics education for all,” and this is done by a number of groups within the Society. Most familiar to the readers of this newsletter, of course, is the Forum on Education (FEd), which was established 1992 as a way for APS members to be involved in activities related to education. Any APS member can join the Forum at no additional cost, and currently about 4000 of the 54,000 members participate.

But what about the other APS entities concerned with education, namely the Committee on Education and the Educational Policy Committee? What are they, who are they, and what do they have to do with FEd?

The [Committee on Education](#) (COE) is an official APS committee, appointed by the Committee on Committees (yes, APS really has one!). There are twelve members who serve three-year terms, and most (but not necessarily all) are from institutions of higher education. The Chair-Elect, Chair, and Past Chair of the Forum on Education all serve *ex officio* on COE. These three maintain the connection between FEd and COE, i.e. between APS membership and its governance.

The official charge of the COE is to undertake physics education activities as directed by the [APS Council](#), and to report to the Council on physics education. (The Council is made up of representatives from all of the units of APS: the Divisions and Topical Groups that focus on specific physics research areas, the geographical Sections, and the Fora that focus on cross-cutting themes such as education or physics & society.) The COE is further charged to improve cooperation between the educational community and other parts of the physics community. It can take on projects of its own; see below for more information on what the group is currently doing.

APS members who are interested in serving on the COE can arrange to be [nominated](#) (or else stand for election to become part of FEd’s Chair line!). If you know of someone who would be a good fit, please consider submitting a nomination on their behalf.

But wait, there’s more. The Educational Policy Committee (EPC) is a subcommittee of the COE. It also communicates and coordinates on education matters with other relevant APS entities, such as the Committee on the Status of Women in Physics (CSWP), the Committee on Minorities (COM), the Physics Policy Committee (PPC), the Panel on Public Affairs (POPA), and the Topical Group on Physics Education Research (GPER). Its main work is with the APS Office of Governmental Affairs (OGA), which can be thought of as APS’s lobbying arm. EPC provides long-term, strategic positioning on policy advocacy and produces time-sensitive reactions to education policy issues (such as proposed laws or government directives) that affect the physics community. It also provides consistent and coherent messaging on education policy issues across APS.

The EPC has six members, and although it is considered a subcommittee of the COE, its membership is not drawn solely from among COE members. The Chair of COE is always a member of EPC, and FEd and GPER each have a representative. The other three members are selected by COE, and may or may not be currently part of COE.

A sample of the current activities that COE members are actively involved in include the [EP3 \(Effective Practices of Physics Programs\) Project](#); recognizing undergraduate departments that graduate significant numbers of physics majors, particularly women and historically underrepresented populations (“[Top Educators](#)”); selecting the recipients of the APS Prize for a Faculty Member for Research in an Undergraduate Institution; the New Faculty Workshop and the Department Chairs’ Meeting; the launch of graduate student and post-doc professional society chapters that are analogous to the Society of Physics Students (SPS) for undergraduates; and a new initiative to support departments under threat of closure or consolidation.

At the present time, the EP3 Project is one of the major efforts among COE members, and since its initial launch is coming within a few months, it is worth mentioning a few other details. The EP3 Project has focused on developing a guide for self-assessment of undergraduate physics programs based on documented best practices linked to measurable outcomes. A compendium known as the “EP3 Guide” will allow departments to assess and improve their own programs so as to respond to local constraints, resources, and opportunities, while being informed by current research and good practice within the discipline. The EP3 Guide will include a set of effective practices and an outline for self-evaluation suitable for departmental review. Many elements will be covered in this document, including considerations of curricula, pedagogy, advising, mentoring, recruitment and retention, research and internship opportunities, diversity, scientific skill development, career/workforce preparation, staffing, resources, and faculty professional development. In addition, the project will train physics program leaders and reviewers in using the Guide, conduct research on the impact of the Guide, and develop a plan for ongoing review and improvement of the Guide under the oversight of the COE in collaboration with AAPT. The project will also run [Departmental Action Leadership Institutes \(DALIs\)](#) to train department members in how to lead their department through facing a challenge or implementing significant change to their undergraduate programs.

Other education-related activities of the APS that the COE remains advised about include the APS Bridge Program, the National Mentoring Community, STEP UP, PhysTEC, Get the Facts Out, and APS-IDEA. More information about any of these programs can be found on the APS website. The EPC is currently actively involved in APS’s broader conversations with government agencies around science and technology funding and policies that impact research

and education, such as those affecting international students. FEd can serve as a conduit for APS members to get involved with these initiatives, and to express concerns about educational issues to the APS leadership. If you are interested in participating in any particular initiative, or if you have concerns you wish to share, contact any of the FEd Executive Committee and we can help you connect effectively. Or nominate yourself to serve!

FEd also exists to help inform APS members about educational initiatives and issues, through FEd-sponsored sessions at meetings and the FEd Newsletter. If you would like to contribute to this mission, please nominate topics for sessions, volunteer to write for the newsletter, or nominate yourself to serve on the Program Committee (FEd organizes sessions at both the March and April meetings, and assists in organizing an education session at DAMOP). ■

STEMM Equity Achievement (SEA) Change Project

Alexis Knaub, Physics & Astronomy SEA Change Project Manager

In January 2018, American Association for the Advancement of Science (AAAS) launched the Science, Technology, Engineering, Mathematics, and Medicine (STEMM) Equity Achievement (SEA) Change Project. This project was designed to support systemic change in equity, diversity, and inclusion (EDI) by removing barriers and creating environments where people are marginalized due to race, gender, disabilities, and other identities can thrive. Institutions interested in participating in the SEA Change project must complete a self-assessment to learn more about what systemic issues exist at their particular institution. The self-assessment requires institutions to examine data on the various populations at the institution, as well as policies and procedures. Using the self-assessment, the institution reflects on the data and creates an action plan to address some areas to improve; the plan must have measurable outcomes and is on a 5-year timeline. As each institution has unique challenges, constraints, and opportunities, these plans address and consider those realities. In other words, plans are not generic solutions but specific to the institutional context. Action plans also must be SMART (SMART: specific, measurable, achievable, realistic, and time-oriented).

Institutions can then apply for a Bronze level award. If awarded, institutions are expected to make steady progress on the plan. After five years, they can reapply. More information on the institutional-level SEA Change work can be found here: <https://seachange.aaas.org/>

Three institutions have received a Bronze award (Boston University, the University of Massachusetts- Lowell, and the University of California- Davis). More information can be found here: https://www.eurekalert.org/pub_releases/2019-02/aaft-art021119.php

For the past three years, leadership from physics and astronomy disciplinary societies have been closely working with AAAS to launch a pilot for a departmental level award. This work is referred to as the Physics and Astronomy SEA Change project. The rationale for a departmental award as well as an institutional award is that departments in postsecondary education institutions have a fair amount of autonomy on important matters such as hiring, admissions, and courses.

While this project is led by Beth Cunningham of the American

Association of Physics Teachers (AAPT), it includes representatives from the following professional societies: American Astronomical Society (AAS), American Institute of Physics (AIP), American Physical Society (APS), The National Society of Black Physicists (NSBP), The National Society of Hispanic Physicists (NSHP), The Optical Society of America (OSA), and The Society of Physics Students (SPS). Both representatives from these professional societies and faculty from physics departments across the US have provided feedback on the pilot and the AAAS departmental self-assessment. Arlene Modeste Knowles (AIP) and Beth Cunningham have written about previous activities in the AAS Women in Astronomy blog: <https://womeninastronomy.blogspot.com/2019/11/physics-and-astronomy-stem-equality.html> The process for applying for and receiving a Bronze award will be similar to institutional awards in that there is a self-assessment, action plan, and that departmental context will be considered. In October, Shirley Malcom and Beth Ruedi, both of AAAS, presented a webinar on the departmental awards project. The video can be viewed here: <https://www.youtube.com/watch?v=MJLA4T88Ne8&t=8s>

The pilot is gearing up to fully launch this academic year. In March 2020, I (Alexis Knaub) started working as the project manager. The work has included recruiting departments to participate by completing the self-assessment and applying for the award; and developing structures for peer review and for supporting departmental awardees in implementing their plans; and developing a webinar series featuring various equity, diversity, and inclusion research-based projects and practices a department may undertake. We also have been interacting with the leadership of various projects and programs within physics and astronomy in order to support one another as well as not “reinvent the wheel.” Departments are encouraged to be involved with other EDI projects and implement already existing practices and programs. We are excited to provide this pathway for interested departments ready to do deep reflection and commit to improving themselves for marginalized people in their departments. ■

For more information about this project, including expressing interest in having your department join the pilot, please contact Alexis Knaub at aknaub@aapt.org.



Alma Robinson, Virginia Tech

With all of the events that have happened this year and the many changes to how colleges, universities, and K-12 schools deliver instruction, teacher preparation programs have also had to reimagine how to recruit, train, support, and mentor their pre-service physics teachers.

Meg Gardner explains how Colgate University's Teacher Preparation Program has joined with campus partners in the Science Outreach Program, as well as the Art and Anthropology museums, to give their pre-service teachers opportunities to engage with area school students and teachers.

Annelise Roti Roti describes the challenges that teacher preparation programs face this year and how PhysTEC is hoping to address them during the 2021 PhysTEC Virtual Conference. The conference will include sessions on best practices for online teaching and teacher preparation, advocating for continued institutional support of physics teacher education programs, and inclusion and accessibility in physics and education.

Building Virtual Partnerships That Enhance Science P-12 Teaching

Meg Gardner, Colgate University

The global pandemic presents immediate and unimaginable challenges to the preparation of pre-service physics teachers. At Colgate University, a small liberal arts institution in Upstate New York, we had to forgo many of our planned recruitment efforts such as poster campaigns and informational sessions on campus, as well as pedagogical pursuits such as methods instruction for peer assistants. Instead, we are leveraging this period of structural instability to develop internal partnerships with the intent to create novel preparation experiences for pre-service physics teachers that will enhance the existing capacities of our surrounding P-12 districts.

Regulations from the State of New York require that all teacher candidates complete 100 hours of course-connected, faculty-supervised fieldwork in a variety of settings. This semester we have been given leniency to offer academic learning experiences to substitute for actual in-person observations.

We quickly realized that we needed to collaborate with our university partners in order to accomplish this task and provide our future teachers with substantive field replacements. We reached out first to internal collaborators, including the coordinator of the Ho Tung Visualization Lab who manages science outreach programs for nearly 30 P-12 districts. In typical years, Colgate students orchestrate field trips for area K-12 students that include a planetarium show and accompanying hands-on activities. Typically, we find that primary grade levels are most attracted to

these trips. One such example experience is when K-6 students would participate in a greenhouse scavenger hunt to decode a secret mineral message in the geology museum alongside their planetarium show that focused on the patterns of motion of the Sun-Earth-Moon system. In the past, teacher preparation students tended not to participate in these activities even though many pre-service teachers planned to work in primary grade level settings. This lack of convergence was not purposeful but rather a result of packed schedules and demands placed on staff.

However, this fall the Colgate Teacher Preparation Program teamed up with Science Outreach to develop opportunities for all. The composition of Colgate students working on Science Outreach Programs is now a mixture of pre-service teachers and undergraduate science majors, many of whom are physics majors. A consortium of Colgate staff from Science Outreach as well as educators from on-campus art and anthropology museums coalesced to create an interdisciplinary curricular endeavor to support the various needs of our local P-12 districts while building supportive relationships across the university. A team meets on a weekly basis to plot out goals and share progress in regards to making the shift to virtual educational environments. It is our hope that this new-found social network can lead to informal recruitment of undergraduate science majors who may not have yet considered teaching as a viable career as well as enhance the cross-disciplinary skill sets of our pre-service teachers.

Another positive effect of this collaboration is in the science methods course, in which teacher preparation students or pre-service teachers at Colgate enroll as they near the end of their program. The methods course involves a micro-teaching component where pre-service teachers use a parallel pedagogical approach with their peers to showcase lesson materials. This assignment has now been revised in order to allow pre-service teachers experiences that are more authentic and timely. We intend for pre-service teachers to develop curriculum for the Science Outreach Program on campus and act as virtual interpreters when K-12 groups are hosted. This change will allow for the obtainment of field hours prior to student teaching while also providing an opportunity to engage in science teaching with an actual school-aged audience in real time.

Through this collaboration, Colgate's pre-service teachers are more intensively involved in the process of curriculum development and instruction than they would be in traditional observations. We've also tasked pre-service teachers with gathering input regarding the needs of science teachers in the area. These insights are useful when making decisions about the type of pedagogical approaches to take and the content to cover in future science outreach endeavors. Colgate pre-service teachers also gain local visibility as they engage with these educators and can forge professional networks that may strengthen their employment prospects

as well as offer insights into district culture and climate.

"Working with the STEAM outreach and virtual field trip group has given me the chance to work with folks across campus toward a new and exciting goal in this strange time of COVID-19. It has been great to be able to work to create and develop unique ways to engage with the schools and students in our local community. I love the fact that we are making the best of a tough situation and in doing so, making our campus more accessible to a broader audience of teachers, students, and parents, as they engage with Colgate virtually," says Colleen Augello, a Colgate graduate student in the Childhood Education program.

This is the first time that the Educational Studies Department and the Science Outreach Program have collaborated so closely toward shared goals. We intend to extend and sustain these relationships beyond our current crisis moment in the hopes of fostering a love of teaching and learning in these pivotal years of career decision making. ■

Meg Gardner is a senior lecturer at Colgate University in the educational studies department who also serves as the director of teacher preparation and a former secondary science teacher.

Annual PhysTEC Conference to Address Physics Teacher Preparation for a New Era

Annelise Roti Roti, American Physical Society

Like many things this year, teacher preparation is under strain due to external pressures exacerbated by COVID-19. In the wake of this and the increase in racial violence and oppression, it is clearly impossible to carry on doing what we might normally think of as "important." As our priorities at home and in education shift, we are faced with both challenges and opportunities.

Physics teacher education (PTE) programs, which are often small and already fighting to bolster their numbers, are now facing the possibility of severe budget cuts. The faculty leading these programs have to teach physics and physics pedagogy online as well as mentor pre-service teachers who are entering a newly uncertain workforce. On top of all that, access gaps and inequities in the education system have been highlighted and intensified at all levels.

Advocacy at a local and national level can highlight the impact of small programs and help them thrive. Clever use of online resources can effectively recruit students to the vital and in-demand profession of physics teaching. Incorporating culturally and trauma-responsive pedagogical techniques and other inclusive and justice-informed behaviors can make your department more

welcoming and reduce inequities in the system, leading to a more diverse physics and physics-teacher community.

The 2021 PhysTEC Conference will be a place to discuss all these ideas and more. On March 5th and 6th, we are bringing together teacher preparation experts from across the country on a virtual platform to address three poignant topics: best practices for online teaching and teacher preparation, advocating for continued institutional support of PTE, and inclusion and accessibility in physics and education.

The conference will include sessions on the following topics:

- Effectively supporting physics learning and pedagogical training in virtual environments
- Recruiting students to physics and physics teaching (especially online)
- Maintaining institutional commitment to PTE
- Culturally-responsive and trauma-informed teaching
- Continuing physics teacher preparation amid budget changes

- Building a just and inclusive culture in your department
- Successful strategies for creating and running PTE programs
- Navigating the teacher certification process in an online environment

Since this conference will be entirely virtual, we are moving away from the traditional method of session delivery and will be working with presenters to structure highly interactive sessions that follow best practices for online professional development. Alongside plenary and workshop sessions, you will have multiple opportunities to debrief and discuss what you have learned so far, to network in informal spaces that are open all day, and to collaborate and interact with peers during a poster session. More infor-

mation on the conference schedule and logistics will be available soon on the [PhysTEC website](#).

Now is the time to come together, strengthen our community, and to reassess what we do in physics and physics education. Some current practices are successful and should be continued, but others will need a radical shift to something new. So join us. Learn what you can, contribute what you will, and leave feeling more prepared to face the remainder of this pandemic and the challenges that will continue to come in its wake. We look forward to seeing you there. ■

Annelise Roti Roti is the PhysTEC Project Coordinator at APS and a future PER student at the University of Maryland.

Browsing the Journals

Carl Mungan, United States Naval Academy, mungan@usna.edu

- An article on page 488 of the October 2020 issue of *The Physics Teacher* (<http://aapt.scitation.org/journal/pte>) suggests having introductory physics students create and present a short YouTube video on some concept in physics. They note that teaching is a good way to learn and this assignment is a fun and effective way to get students to teach others. I have tried this technique in upper level but not in introductory physics and agree with these ideas. The authors present a helpful rubric for grading the video and also suggest the audience fill out a worksheet while listening to the presentation to keep them engaged with and accountable for the content of the presentation. Another article on page 502 of the same issue considers two different ways to wire an ammeter and voltmeter to a resistor connected to a battery to make four-point measurements of resistance.
- Tim Gfroerer and Morgan Bergthold use a Michelson interferometer to measure the coherence length of a laser diode for different drive currents on page 740 of the September 2020 issue of the *American Journal of Physics* (<http://aapt.scitation.org/journal/ajp>).
- Experiments and modeling are used to explain why a glass of water covered by a disk with a small hole in its center does not spill when inverted in article 055023 of the September 2020 issue of *Physics Education*. The journal can be accessed online starting at <http://iopscience.iop.org/journalList>.
- The September 2020 issue of the *Journal of Chemical Education* is very long because it is a special issue devoted to insights gained in teaching during the current challenging COVID era from a large variety of different kinds of colleges and courses. The journal archives are at <http://pubs.acs.org/loi/jceda8>.
- There is an interesting review of how and why we use approximations in physics in the July 2020 issue of *Resonance*. The journal can be freely accessed at <http://www.ias.ac.in/listing/issues/reso>.
- Article 020114 in *Physical Review Physics Education Research* at <https://journals.aps.org/prper/pdf/10.1103/PhysRevPhysEduRes.16.020114> shows that use of percentage versus 4-point-scale grades results in significantly different measures of student performance in introductory physics, especially at the low end of the scoring range.



Web Watch

Carl Mungan, United States Naval Academy, mungan@usna.edu



- The surface of Mars recorded by NASA's Curiosity rover can be explored at <https://accessmars.withgoogle.com/>.
- A comprehensive interactive periodic table of the elements is available at <https://ptable.com/>.
- Science stories from the past can be perused at <https://www.sciencehistory.org/distillations>.
- Vanderbilt has a nice discussion of active learning strategies for hybrid or remote teaching at <https://cft.vanderbilt.edu/2020/06/active-learning-in-hybrid-and-socially-distanced-classrooms/>.
- Downloadable kits to explore various aspects of color in the natural world can be found at <http://www.colorsofnature.org/education-kits/>.
- Interactive Lecture Demonstrations (ILDs) adapted for physics students working at home are available at <https://pages.uoregon.edu/sokoloff/HomeAdaptedILDs.html>.
- At least one of my intro students found helpful the online quadratic equation solver at <https://www.mathsisfun.com/quadratic-equation-solver.html>.
- The web sites <https://www.science-sparks.com/> and <https://inspirationlaboratories.com/tag/summer-science-series/> have science experiments for elementary school children; also see <https://wowscience.co.uk/> for a British version. Fun science sites for older children are <https://sciencebob.com/> and <https://sciencepickle.com/>.
- UNESCO has the heritage of astronomy portal at <https://www3.astronomicalheritage.net/>.
- Western Washington University has a collection of science podcasts at <https://www.sparksciencenow.com/category/podcast/>.
- The paucity of diversity in much of tech entrepreneurship is analyzed at <https://leakytechpipeline.com/>.
- Two sites promoting girls in STEM are <https://writix.co.uk/blog/engaging-girls-in-stem> and <https://shecanstem.com/>.
- The concept of citizen science is presented in the PBS series <http://crowdandcloud.org/>.
- The web site <https://www.sciencenewsforstudents.org/> has excellent articles from all fields of science.
- Finally, lots of free classic eBooks are at <https://www.planetebook.com/>.

Executive Committee of the FEd

Chair

Gerald Feldman
(01/20 - 12/20)
George Washington University

Chair-Elect

Catherine Hirshfeld Crouch
(01/20 - 12/20)
Swarthmore College

Vice-Chair

Eric Brewe
(01/20 - 12/20)
Drexel University

Past-Chair

Laurie E McNeil
(01/20 - 12/20)
University of North Carolina - Chapel Hill

Secretary/Treasurer

Laura Rios
(01/20 - 12/22)

Councillor

Noah Finkelstein
(01/17 – 12/20)
University of Colorado, Boulder

Members-at-Large

Mackenzie Stetzer
(04/18 – 12/20)
University of Maine

Adrienne Traxler
(01/19 – 12/21)
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