American Association of Physics Teachers®
Enhancing the understanding and appreciation of physics through teaching

August 24, 2026

Suzanne Plimpton
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Dear Ms. Plimpton:

Thank you for the opportunity to comment on NSF's proposed Guidance on Financial Assistance.

The American Association of Physics Teachers (AAPT) is the leading professional membership organization dedicated to enhancing the understanding and appreciation of physics through teaching. Founded in 1930, AAPT supports a diverse, global community of physics educators, researchers, and students across all academic levels, from K-12 through postsecondary education. By providing top-tier professional development, publishing premier peer-reviewed journals, and hosting influential national conferences, the association fosters a vibrant environment committed to advancing excellence and equity in physics education. AAPT has received federal support through grants from the National Science Foundation and the National Aeronautics and Space Administration to develop and deliver programs and activities supporting the physics education community.

As detailed in AAPT's public comment, OMB's proposed changes to the Uniform Guidance threaten the future of U.S. science. The proposed changes undermine the merit review process by inserting a political appointee into the grant approval process and destabilize grant funding with the risk of sudden funding cancellation. Below, we describe the sections that are of particular concern to AAPT and our members.

Section on conference attendance: Draft GFA Guide 12 and 2 CFR § 200.432(b):

How the proposal would affect us. The current rule already requires conference attendance to be necessary and reasonable for federal award performance. Attending

professional society conferences, such as AAPT's national meetings, helps federal grant recipients disseminate results as outlined in their awards. For education grants, dissemination is not merely disseminating results through traditional publications. There are workshops and other opportunities that support educators in learning how to adopt the research-based strategies for their classrooms; adopting this work is contextual, and educators need interactive support to understand how these strategies could best work in their own classrooms. We note that award terms are fixed before conference schedules exist, so event-by-event written approval would force continuous award amendments (if amendments are approved at all).

Conferences sponsored by professional societies serve the federally funded work. They are where federally funded results are disseminated and where the technical workforce is trained. Scientific presentations are based on federally funded work given at AAPT national conferences, and many principal investigators (PIs) researching new teaching methods facilitate workshops at our conferences. Award timelines do not often match conference planning timelines, which often start a year or less before the meeting. Deadlines for abstracts, sessions, and workshops are closer to conferences to account for the most up-to-date results in research to be presented. None of these important parts of the AAPT national conference would be available when a proposal is submitted. Furthermore, any delays in approval after the grant is funded may jeopardize the participation of a grant recipient in a conference. If PIs aren't able to attend scientific conferences, this will decrease the impact of federal funding on the broader community of science learners and educators.

Specific provisions of concern. The research community will be hurt if those working on federally funded projects are not encouraged or able to share their findings at professional society conferences. A reduction in the number of attendees due to a lack of grant support to cover the cost of registration, travel, and hotel at association conferences causes harm to the association and limits the impact of grants to the broader scientific community. AAPT relies on the revenue from registration to cover the expenses for running a scientific conference. Fewer attendees would increase the costs for those who can attend, which will further negatively impact those who have access to the current best practices and will, in turn, impede the positive impacts of the work being used. Furthermore, fewer attendees at scientific conferences impact the host city. Fewer attendees translates to fewer people eating meals at local restaurants, fewer stays in hotel rooms, and less spent at local attractions and shops. Host city residents also benefit from our conferences, because local physics educators can more easily attend and reap the benefits of renowned educators and researchers. Financial and

other constraints can impede educators from attending national conferences. No one can plan the conferences they attend 3-4 years in advance, and some conferences, like AAPT's conferences, aren't scheduled and planned that far in advance. This would be particularly impactful at any conference on emerging issues that are planned only a few months before they are held.

Conclusion. We recommend that the current PAPPG be retained.

Section on periodical subscriptions: Draft GFA Guide 12 and 2 CFR § 200.454(b):

How the proposal would affect us. AAPT publishes two periodicals, *The Physics Teacher* and the *American Journal of Physics*. Both journals provide avenues for physics educators and scholars to publish research related to federally funded work. These two journals are peer-reviewed and highly regarded in the field. AAPT relies on revenue from institutions of higher education library subscriptions, around 45% of AAPT's revenue, to carry out the programs and activities that support physics educators and improve physics teaching and learning from K-12 through graduate education.

Specific provisions of concern. Periodicals are one of the most important ways that indirect costs from federal grants received by institutions of higher education are used. All of science relies on having a robust and accurate scientific record. This is a cornerstone of "gold standard science." For education, periodicals are also a way for educators to learn about current best practices and consider how they can use those practices to improve their teaching. Specifically, K-12 educators and Two-Year College faculty often interact with fewer physics colleagues and do not have the resources to attend conferences, so these periodicals offer a cost-effective collaboration opportunity. If indirect costs are not able to be used for periodicals, then scientific progress will be stalled through both impeding the spread of research and impeding educators in providing the highest quality science education possible. Publication revenue, particularly library subscriptions, is used by professional societies like AAPT to carry out the programs that support the scientific community. If the cost of AAPT's publications can't be covered by the indirect costs from grants that institutions of higher education receive, then it reduces this revenue for AAPT's programs.

Conclusion. We recommend that the current PAPPG be retained.

Section on Journal publication charges: Draft GFA Guide 12 and 2 CFR § 200.461 (with § 200.421):

How the proposal would affect us. As noted above, AAPT publishes two periodicals, *The Physics Teacher* and the *American Journal of Physics*. Both journals provide avenues for physics educators and scholars to publish research related to federally funded work. This research is critical to provide physics educators the opportunity to learn about the latest practices to ensure physics learners receive the highest quality education possible. These two journals are peer-reviewed and highly regarded in the field. Approximately 10% of the *American Journal of Physics* articles and about 5% of *The Physics Teacher* articles are published with open access. AAPT relies on revenue from institutions of higher education, library subscriptions, and authors, around 45% of AAPT's revenue, to carry out the programs and activities that support physics educators and improve physics teaching and learning from K-12 through graduate education.

Specific provisions of concern. Periodicals are one of the most important ways that scientists disseminate the results of scientific research, much of it funded by federal grants. All of science relies on having a robust and accurate scientific record. This is a cornerstone of "gold standard science." Publication revenue, including journal publication charges, is used by professional societies like AAPT to carry out the programs that support the scientific community. For education, periodicals provide a way for educators from K-12 through graduate education to adopt the current best practices. If the cost of AAPT's publications can't be covered by the indirect costs and journal publication charges from grants, then it reduces this revenue for AAPT's programs. In particular, authors selecting to publish their articles as open access pay an article processing charge. By disallowing publication charges, fewer articles will be published in open access. This will impede the quality of physics education for all, because AAPT will not be able to offer the same quality of programs due to reduced revenue, and physics educators at all levels will lose a way to learn about the current best practices. For both cases, this means the current and future generations of science learners may not receive an excellent physics education that would support a variety of careers and interests. The future is open access, providing access to science for all. This rule will delay or, potentially, eliminate the goal of having open-access science and harm the future of STEM education and the STEM workforce. As with periodical subscriptions as described above, periodicals are also a way for educators to learn about current best practices and consider how they can use those practices to improve

their teaching. Publication revenue, particularly library subscriptions, is used by professional societies like AAPT to carry out the programs that support the scientific community. If the cost of AAPT's publications can't be covered by the indirect costs from grants that institutions of higher education receive, then it reduces this revenue for AAPT's programs.

Conclusion. We recommend that the current PAPPG be retained.

Section on the membership dues: Draft GFA Guide 12 and 2 CFR § 200.454(a):

How the proposal would affect us. AAPT has received federal support through grants from the National Science Foundation to develop and deliver programs and activities supporting the physics education community. AAPT members serve as important leaders in these grants, serving as principal investigators, facilitators, advisors, and active participants. AAPT members receive professional development from leaders on these grants, which support them in continually improving their physics teaching and providing a high-quality physics education from K-12 to adult students. Membership dues for participants are often included in grants. AAPT membership provides considerable professional value at a relatively low cost, serving as an important stepping stone in their career advancement.

Specific provisions of concern. Enactment of this provision will likely force some AAPT members to drop their memberships, particularly those working in rural high schools and community colleges where budgets are already stressed. K-12 teachers, specifically, are less likely to be funded by their individual schools or districts. Decreasing such funding opportunities for K-12 will decrease those who can partake in AAPT events, barring them from quality physics professional development. In turn, this would negatively impact their students, school, and district as it further restricts access to quality physics education.

These individuals may not renew at all. AAPT relies on membership dues, which comprise approximately 18% of AAPT's total revenue. A loss of any member causes not only a financial impact on AAPT but also a loss of the intellectual contributions of that member to AAPT's activities and the opportunity for that member to benefit from AAPT and other members' activities. This, in turn, negatively impacts the physics education received by students of all levels and the long-term health and relevancy of

the scientific workforce. This is a loss to national innovation for research, because it will undercut AAPT's role as the association leading efforts to organize efforts supporting physics education.

Conclusion. We recommend that the current PAPPG be retained.

Section on the at-will termination and suspension: Draft GFA Guide 25 and 2 CFR § 200.340–200.343:

How the proposal would affect us. AAPT has received federal support through grants from the National Science Foundation to develop and deliver programs and activities supporting the physics education community. Full- and part-time staff are partially or fully supported by federal grants. In the past, federal funding allowed AAPT to develop programs that address the full spectrum of physics education from K-12 through graduate education, as well as teacher preparation. One example is our mentoring programs providing professional development to high school physics teachers in urban and rural locations, two-year college physics faculty, and four-year college and university faculty. An impact of this support has been to double the number of physics majors in twenty years (from the late 1990's to the early 2020's) as a result of improving the teaching of physics in institutions of higher education. These programs are vital to ensure that learners at all stages receive the highest quality physics education possible, so that they can not only develop an appreciation and understanding of physics but also pursue the numerous career paths that rely on physics knowledge.

Specific provisions of concern. We have experienced first-hand the impact of the cancellation of grants mid-grant period when two of our grants were cancelled in 2025. This caused a loss of around $1.4 million in support for programs supporting the two-year college physics educator community and high school physics teachers. We expected these projects to positively impact 110,000 students taking physics classes at two-year colleges and over 1,800 high school physics teachers and approximately 18,000 high school students; preliminary results from this work indicated that these positive impacts were likely to result from this work. For example, one NSF grant would have continued previous positive results studying a teacher's supportive actions with an increase in students' future physics intentions. This continued the previously funded work that aimed to increase the number of U.S. domestic physics majors. In addition, these grants supported two full-time staff and many other part-time employees. As a

consequence of the cancellations, the research questions remain unanswered and impact the future of physics teaching in both K-12 and two-year colleges. Volunteer labor cannot substitute paid staff labor while maintaining a high-quality delivery of programs that yield positive results.

Our membership has been similarly impacted, particularly the Physics Education Research (PER) community. The PER community collectively conducts studies on all aspects of physics education and aims to create physics environments where education is relevant, materials are well-delivered, and individuals have the opportunity to appreciate and understand physics without unnecessary barriers. They have also experienced first-hand the impact of grant cancellations in 2025. This has resulted in job loss, disrupted education plans, and abrupt premature ending of projects aimed to improve physics learning space from K-12 through graduate education. These cancellations harm the scientific enterprise, in both the immediate present and foreseeable future.

Bottom line, cancelling grants mid-project is a waste of taxpayer dollars and creates uncertainty for the associations and individuals involved in the project.

Furthermore, uncertainty regarding funding will dissuade those AAPT members and staff with new ideas from submitting proposals, thus preventing innovation that will improve teaching methods and learning environments from being implemented, directly impacting the competitiveness of U.S. students and the U.S. scientific workforce.

Conclusion. We recommend that the current PAPPG be retained.

Section on the political pre-issuance review of awards: Draft GFA Guides 8 and 9 and 2 CFR § 200.205(b):

How the proposal would affect us. This section contains undefined criteria, such as whether an award "demonstrably advances the President's policy priorities" or avoids "anti-American values." These undefined criteria and ambiguous processes make awards unpredictable and stifle innovation. NSF has only one political appointee, making it either unclear or impossible for a review to happen.

Specific provisions of concern. Preparing grant proposals already requires a substantial investment in AAPT staff and member time, because AAPT and its members

consider how to meet the requirements of the request for proposals. We would need to weigh whether we will submit grant proposals if they will not be funded because a political appointee determines that the proposal doesn't satisfy the policy priorities of the President. Having proposals be reviewed in consideration of the perceived "President's policy priorities" not only undermines the scientific review process, which determines whether the individual proposals meet the priorities established in the calls, but also creates needless bureaucracy. Scientific study should reflect questions of the time, previous research, and the needs of our country. Limiting what can be studied in future proposals will limit new discoveries and scientific advancement.

The projects AAPT and its members are likely to propose are particularly at risk because of the nature of Physics Education Research (PER) and the efforts to make physics education accessible for all students. In theory, making an excellent physics education accessible for all students should be a Presidential priority and pro-American, regardless of the administration's party. However, these undefined criteria and other actions from the federal government suggest that we cannot assume that access and opportunity for all is a priority.

Current and historic events demonstrate why politics should not impact science if we want the U.S. to thrive. As the 1986 Challenger shuttle disaster showed, politics can't drive science. Richard Feynman, U.S. Nobel Laureate, stated, "For a successful technology, reality must take precedence over public relations, for nature cannot be fooled." Feynman noted that political and budgetary pressures forced NASA into a "kind of Russian roulette". He pointed out that managers exaggerated the safety of the shuttle to the public and Congress to secure funding, ignoring warnings from their own engineers. The same type of decisions could happen if this section is enacted.

Conclusion. We recommend that the current PAPPG be retained.

Section on broadening participation and students, scientists, and workforce development: Draft GFA Guide 19 / 2 CFR § 200.300 (Statutory and national policy requirements) and § 200.218 (Disparate-impact liability)

How the proposal would affect us. The diversity, equity, and inclusion ban would block federal funds from supporting or promoting Diversity, Equity, and Inclusion

(DEI/DEIA) initiatives that are perceived to conflict with applicable Federal anti-discrimination laws (§ 200.300). Lawful, established efforts to increase participation in science may be put at risk of elimination. The draft GFA also aligns with Executive Orders revoking non-discrimination and environmental justice frameworks. In addition, disparate-impact restrictions would ban the use of federal funds for disparate-impact studies, related litigation, or operational policies aimed at mitigating systemic disparities (§ 200.218), severely limiting topics like education research.

Specific provisions of concern. As noted above, the projects AAPT and its members are likely to propose are particularly at risk because of the nature of Physics Education Research (PER) and the efforts to make physics education accessible for all students. "DEIA initiatives" is ambiguous, at best, and we anticipate that this ambiguity will be used to block lawful efforts.

As an example of this ambiguity, in April 2025, Dr. Sethuraman Panchanathan, NSF Director, wrote that NSF's broadening participation activities should create opportunities for all Americans everywhere. The next month, an NSF award on which AAPT participated was terminated despite being in alignment with these stated priorities. This project's goal was to systemically transform postsecondary physics and astronomy departments through careful examination of their policies, practices, climate, and culture in order to create law-attentive 5-year action plans, plans that include improved mentorship and more relevant physics curricula for all students. Other physics education projects were terminated that were compliant with the law and in alignment with NSF's priorities as described by Panchanathan. Despite these projects focusing on understanding and addressing participation in STEM and being in accordance with all applicable statutes and mandates, they were deemed to "no longer effectuate NSF priorities." The US risks excluding STEM talent to meet the current and future needs of US employers if these types of programs are not funded because they are deemed "unlawful" or are not interpreted as falling under the President's priorities.

Conclusion. We recommend that the current PAPPG be retained.

If implemented, these provisions would dismantle the long-established, bipartisan system of checks and balances that has ensured taxpayer dollars fund science on merit, not politics. This, in turn, would decimate scientific progress, making the future of the U.S. and its citizens worse. We urge NSF to retain the current PAPPG and not implement the GFA Guide.

Thank you for your consideration.

Sincerely,

Debbie Andres
AAPT President

Beth A. Cunningham
AAPT Chief Executive Officer