PROPOSED APS STATEMENT ON UNDERGRADUATE RESEARCH
STATUS & SUPPORTING DOCUMENTATION

Proposed APS Statement:
The American Physical Society calls upon the nation’s colleges and universities and their physics and astronomy departments to provide all undergraduate physics and astronomy majors with access to significant research experiences.

CONTEXT

Research experiences provide students with skills in problem definition, project design, open-ended problem solving, use of modern instruments and techniques, data collection and analysis, analytical and computational modeling, and communication of evidence-based technical arguments. These skills are of great value to students as they go on to engage in future scientific enterprises and positively impact the overall economic and social well-being of the nation. Participation in research has been shown to increase retention in STEM degree programs, support students’ decisions to pursue STEM careers, and enables students to more effectively transition from the classroom to professional practice.
Why should the APS make this statement?

Sixty-two percent of students majoring in physics participate in research during their undergraduate careers, more than any other major except biochemistry and astronomy, according to the National Survey of Student Engagement [NSSE 2012]. Given the benefits that students take from this activity, the undergraduate research participation rate should be a point of pride for our field. As stated in the “Context”, participation in research increases retention in STEM degree programs [Nagda 1998, Harrison 2011, Lopatto 2007] and enables students to more effectively transition from the classroom to professional practice [Hunter 2006, Thiry 2011, Junge 2010]. Furthermore, undergraduate research promotes a diverse workforce [PCAST 2012, Summers 2006].

However, our college and university physics departments and the physics community as a whole also accrue benefits from the high undergraduate research participation rate. At a time when the mission and nature of higher education are being questioned by policy-makers and university physics departments are being terminated in haphazard ways, the physics community should speak clearly about the critical ingredients in effective higher education.

The physics community should now encourage all students to participate in undergraduate research for two reasons:

1) Research experiences solidify physics knowledge and an understanding of how science is actually done; and,

2) The practical experiences students encounter in research environments prepare them for a wide range of career paths, including graduate work.
Who are the potential proponents and critics of the statement and what have been/are the actions of other scientific organizations?

The AAPT adopted this statement on undergraduate research in 2009:

*The American Association of Physics Teachers urges that every physics and astronomy department provide its majors and potential physics majors with the opportunities and encouragement to engage in a meaningful and appropriate undergraduate research experience.*

Why does the statement need to be issued now?

Preparing students as well as possible for the workforce or graduate study has never been more important than it is now. Providing opportunities for research experiences for *all* students will set an equality standard that crosses socioeconomic lines. In addition, this statement will prompt all colleges and universities to recognize the fundamental importance of research experiences in higher education.

What should the Society do with the statement?

If the statement is adopted, it will be important to make sure that four constituencies are made aware of this new standard for our field:

1) college and university physics departments;
2) postsecondary administrators;
3) postsecondary education policy-makers; and,
4) the education media.

Will the statement have enduring value or is it a temporary position on an issue of specificity?

Postsecondary education is experiencing an historic shift to accommodate our new technology-centered society. The importance of providing our students the best possible preparation for this new society will only increase.
References

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