



June 17, 2015

The Honorable France Cordova
Director, National Science Foundation
4201 Wilson Blvd
Arlington, VA 22230

Dear Dr. Cordova:

As presidents of the American Physical Society, American Chemical Society, and American Mathematical Society, we support the National Science Foundation's (NSF) efforts to promote Advanced Placement (AP) courses in engineering and computer science. Those disciplines, which are built on fundamental principles in chemistry, mathematics and physics, offer students pathways to rewarding careers and well-paying jobs. Those disciplines are also vital cogs in America's innovation economy, and they are essential to America's global competitiveness.

But in parallel with NSF's engineering and computer science efforts, we urge the foundation to encourage all U.S. students to strengthen their knowledge of math and science – subjects that are the foundation of so much of the 21st century high-tech enterprise.

With the jobs of the future demanding even greater math and science proficiency, we have much work to do. In 2013, for example, only 4.3 percent of high school graduates took and passed the AP Calculus AB exam; 1.94 percent passed the AP Chemistry exam; 1.37 percent passed AP Physics B exam; and just 0.78 percent passed the AP Physics C exam. These rates are simply unacceptable in a 21st century economy dependent on a STEM educated workforce.

To address the alarming statistics, it is essential that high schools offer calculus, chemistry and physics courses ubiquitously and that they recruit highly qualified instructors to teach them. In that regard, we recommend that NSF accelerate the development of projects focused on student-centered, engaging curricula and provide funding to educate pre-service and in-service teachers in the use of such pedagogical methods

Without increasing the number of highly qualified high school mathematics, physics and chemistry teachers any effort will fall far short of the desired goals. The Department of Education's Schools and Staffing Survey shows just how dire the situation has become: today, fewer than half of all physics and chemistry classrooms have a teacher with a degree in the discipline, and only two thirds of math teachers have a math degree. It is no wonder that the American Association for Employment in Education lists those three subjects as having the highest need. The issue demands immediate attention.

As leaders of professional societies we pledge to engage our members in supporting improved education of high school teachers in our respective disciplines and to work with the National Science Foundation in its efforts to develop and disseminate curricula that promote fundamental learning required for students to succeed in engineering, computer science and throughout the STEM disciplines.

Sincerely,



Sam H. Aronson
President
American Physical Society



Robert L. Bryant
President
American Mathematical Society



Diane Grob Schmidt
President
American Chemical Society