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Physics and Education

HELEN QUINN, Retired

I make a distinction between science outreach work and science education work, and my stress in this talk will be on the latter, though I have done both. Using my own career in physics and education as an example, as well as some examples of the contributions of other physicists, I will discuss the variety of ways in which scientists can contribute to science education at the pre-college level. I will argue for the need for more scientists to undertake this work as a serious professional commitment. In order to do so effectively a scientist must take the time to learn about science education and research on learning, and about how the education systems and policies that one is trying to impact function and are controlled. While working with individual teachers and/or their students provides a valuable service to those individuals, working at the State and National policy level, or with those developing curriculum materials, professional development for teachers and assessment strategies aligned to the broadly adopted Next Generation Science Standards can have much broader impacts. These standards have been adopted by over 14 states and have strongly influenced the science standards of a number of others. I will talk about my role in developing the vision of three-dimensional science education embodied in those standards, explain the fundamental components of that vision, and discuss the work that still needs to be done to realize that vision over the coming years.