Testimony of Carl E. Wieman
Senate Committee on Commerce, Science and Transportation
May 20, 2010

Chairman Rockefeller, Ranking Member Hutchison, and distinguished members of this Committee, it is a great honor to appear before you today. I am grateful for President Obama's confidence in nominating me to be the Associate Director for Science in the White House Office of Science and Technology Policy (OSTP).

OSTP's science portfolio is remarkably broad, and I appreciate the work of this Committee in addressing many of those issues. If confirmed, I look forward to working with all of you.

I grew up deep in the forests of Oregon. I can still remember first getting on the school bus and riding it many miles over unpaved roads to attend first grade. I never imagined that was the first step on a journey that would lead me to sitting before you today to discuss my nomination.

My early education was in a tiny school in rural Oregon and was greatly supplemented by reading many books from the public library in the distant town of Corvallis. For middle and high school, my family relocated to Corvallis, the home of Oregon State University, to allow me and my siblings to attend a better school system. After completing high school, getting on an airplane for the first time to go off to college at MIT was another big step on my journey to sitting here today.

I nearly failed my first physics course at MIT, but I was fortunate enough to have the opportunity to work in a physics research laboratory. I discovered that *doing* science was far more rewarding than studying *about* science. My work in the lab became a consuming passion and gave me a superb education. I became fascinated with what one could learn from blasting atoms with light from a new type of laser, and I saw this as opening up an exciting unexplored territory.

That exploration led me to graduate work at Stanford University and ultimately to a long and successful career as a professor of physics at the University of Colorado. I feel that my strengths as a scientist are recognizing opportunities earlier and working a bit harder than others, and being able to build things that have unique capabilities, usually while held together with duct tape and costing a fraction of the price of the competition. These talents may all prove useful in government service, should I be confirmed.

I have also devoted much of my career to the issue of science education. As a young assistant professor, I approached teaching as most do, figuring out the subject to be taught clearly in my own mind and then explaining it to the students-- expecting that they would then understand it as

I did. However, when I measured what my students were learning I discovered that what I thought was clear and simple, the students found incomprehensible. I was puzzled and frustrated by this result.

That experience led to what has now been a nearly 20 year effort of mine to understand how people learn science and how to teach it more effectively. I have conducted research and worked with a number of groups, particularly the National Academy of Sciences, who share my interests in improving science, technology, engineering, and mathematics (STEM) education. This has led me to understand both my early failings as a teacher and how I and others can teach science more effectively.

Our global economy is increasingly based on science and technology. To maintain US economic competitiveness and leadership in innovation, we need to also have leadership in STEM education. This will both enhance the scientific and engineering workforce and the technical literacy of all our citizens, providing them with complex problem-solving skills they can use in many aspects of their jobs and lives.

President Obama has assembled an exceptional scientific team, including Energy Secretary Chu, who has been a friend for decades and first talked to me about the importance of government service, and OSTP Director, Dr. Holdren. I look forward to the opportunity to work with them, as well as the members of this committee and this Congress, to develop effective and efficient programs that will maintain our leadership in scientific research, to measure results of our investments in this area, and to greatly improve STEM education. If confirmed, I hope to use my scientific background, as well as my experience in STEM education, to deepen the science policy dialogue and to enhance progress in STEM education in this country.

I am pleased to try to answer any questions you may have.

Thank you.