The Twentieth Annual Moti Lal Rustgi Memorial Lecture

What is changing in Science Education, and what does that mean for you and your children?

Friday, April 25, 2014
5:00 pm
114 Norton Hall
UB North Campus
Free and Open to the Public

Abstract: At both the K-12 and the college level significant changes are underway in how science is taught. The report “A Framework for K-12 Science Education” has led to the Next Generation Science Standards, which have been adopted by 8 states and are under consideration in many more, including New York. These standards stress engagement of students in the practices of science and engineering, along with a focus on a limited set of core ideas of the major natural science disciplines and of major concepts that are common across them (cross-cutting concepts). At the undergraduate level similar change in emphasis, toward doing rather than simply knowing about science, is recommended based on research on learning, particularly that summarized in “Discipline Based Education Research” (another Board on Science Education study). I will discuss how the framing of a set of science and engineering practices and cross-cutting concepts in the K-12 Framework informs the shifts needed at both levels. Importantly, future science teachers, including elementary school teachers (many of whom are not science majors and take only introductory science courses at the college level), will need to experience the science practices in their college science courses in order to be able to support their students in using them effectively. I will argue that these shifts in science teaching and learning can benefit all students.

Helen Quinn is professor emerita in the Department of Particle Physics and Astrophysics at the SLAC National Accelerator Laboratory and Chair of the National Research Council’s Board on Science Education. Dr. Quinn is a theoretical physicist who was inducted into the National Academy of Sciences in 2003 and holds numerous honors, including the prestigious Dirac and Klein medals, for her research contributions. She was most recently awarded the 2013 J.J. Sakurai Prize (together with Roberto Peccei) for their fundamental theoretical contributions on CP violation which led to the prediction of axions, a candidate dark matter particle. She received her Ph.D. in physics from Stanford University. She is a Fellow and former president of the American Physical Society. She has had a long term engagement in education issues at the local, state, and national level. Her interests range from science curriculum and standards to the preparation and continuing education of science teachers. Dr. Quinn has served on numerous National Research Council committees. Her most recent NRC committee work includes the Committee on a Framework for Assessment of Science Proficiency in K-12 and the Committee on Human Spaceflight. Her earlier NRC experience includes (among others) chairing the committee the produced the report “A Framework for K-12 Science Education” and the Committee on the Review and Evaluation of NASA’s Pre-College Education Program; and membership on the committee that produced the report “Taking Science to School”; and, as part of the 2010 astrophysics decadal study, the Panel on Particle Astrophysics and Gravitation.