

**Symposium on Undergraduate Nano-Education:  
"Addressing the Challenges of Nanoscale Science & Engineering Education"**

**Presentation:**

"Understanding Student Understanding at the Nanoscale: Contrasting Conceptions of Size & Scale"

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**Presenter Biography:**

Gregory Light is the director of the Searle Center for Teaching Excellence and an associate professor in the School of Education and Social Policy at Northwestern University. Prior to arriving at Northwestern University in 2000, he was deputy head and then head of the Lifelong Learning Group at the Institute of Education, University of London (UK). He has taught post-graduate courses in higher and professional education and consulted across the higher and professional education sector in North America, Europe and Asia. His research and scholarship focuses on the theory and practice of learning and teaching in higher and professional education. He has a particular interest in science and science related education. He is currently the principle investigator (PI) or co-investigator on four major research projects studying critical areas of teaching and learning in the sciences, engineering and medicine. His research and his publications are focused on student learning and the professional development of teaching in higher education. He is author of the book *Learning and Teaching in Higher Education: The Reflective Professional*. (Sage, March 2009).

**Abstract:**

The importance of "size and scale" in nanoscience and engineering has been recognized by both scientists and science educators. A solid understanding of this concept is key to the learning of nano-related materials. However, little research has been done to explore how students understand this crucial concept in the undergraduate context. To address this gap in the research, we conducted a series of hierarchically related studies which identified four major categories of student conception: *fragmented, linear, proportional* and *logarithmic*. This talk will describe the studies and the typology of student conceptions of size and scale at the undergraduate level. It will also talk about the implications for developing instructional interventions to help students develop more sophisticated understandings of "size and scale".