UNL Department of Physics and Astronomy presents:

Taking a Scientific Approach to Physics Teaching and Learning

PRESENTED BY

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Refreshments will be served in the JH 1st Floor Vending Area at 3:30

ABSTRACT

Guided by experimental tests of theory and practice, science and engineering have advanced rapidly in the past 500 years. Guided primarily by tradition and dogma, science and engineering education have remained largely medieval. This is starting to change as a result of recent research on the development of expertise and on the teaching and learning of science at the university level. Research on how people learn combined with classroom experiments is now revealing much more effective ways to teach and evaluate learning of physics at the university level than the traditional lecture and exam. I will discuss these data and the underlying principles of learning they illustrate--principles that apply generally to the development of expertise in physics. I will also touch on our research on the consistent set of decisions used by good physicists (and surprisingly, other science disciplines) in solving problems. Practice making these decisions in authentic situations and getting feedback on those decisions is the key to learning to think like a physicist. This applies to both classroom instruction and supervision of research students. This research is setting the stage for a new approach to teaching that can provide the relevant and effective physics education that is needed by all students that is needed for the 21st century. It also provides a better way to evaluate teaching quality.