PHYSICS COLLOQUIUM

The Phases of Physics Education Research: Investigation of Student Reasoning, Curriculum Development, and Assessment of Instruction

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The goal of Physics Education Research (PER) is to improve the effectiveness of physics instruction. PER comprises systematic investigations into students' reasoning, development of new curricular materials, and careful assessment of student learning. As an example of the "basic research" phase of PER, I will describe our investigation into students' reasoning in thermodynamics. Analysis of students' written explanations along with one-on-one interviews has disclosed persistent confusion regarding process-dependent quantities such as heat and work. Curricular materials designed to address these difficulties are being developed and tested. In a broader context, we are engaged in development of a "Workbook for Introductory Physics" comprising curricular materials for an entire semester of fully interactive lectures in a large-enrollment class. Efforts to assess these materials raise general questions regarding measurement of learning gain and evaluation of instructional methods.

Refreshments will be provided.