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Abstract for an Invited Paper
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Jonathan F. Reichert and Barbara Wolff-Reichert Award for Excellence in Advanced Laboratory Instruction: Advanced Instructional Labs: Why Bother?
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What are we teaching about physics in the traditional lecture course? Plenty! By offering the Advanced Laboratory Course, we hope to shed light on the following questions: How do we develop a systematic process of doing experiments? How do we record procedures and results? How should we interpret theoretical concepts in the real world? What experimental and computational techniques are available for producing and analyzing data? With what degree of confidence can we trust our measurements and interpretations? How well does a theory represent physical reality? How do we collaborate with experimental partners? How do we best communicate our findings to others? These questions are of fundamental importance to experimental physics, yet are not generally addressed by reading textbooks, attending lectures or doing homework problems. Thus, to provide a more complete understanding of physics, we offer laboratory exercises as a supplement to the other modes of learning. The speaker will describe some examples of experiments, and outline the history, structure and student impressions of the Advanced Lab course at the University of Chicago Department of Physics.