

IUPUI Department of Physics Presents:

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Using research to enhance learning of mechanics and electromagnetism beyond the introductory level

Thursday, September 27*

3:30 pm, LD 010

402 N. Blackford Street

Refreshments at 3:00 pm in the Physics Conference Room LD 154B For additional information call 274-6900



Abstract:

Research in physics and engineering education has demonstrated that traditionally taught introductory courses have minimal effect in developing conceptual understanding, problem solving skills, mathematical acuity, and scientific reasoning ability in most students. One major area of research is being conducted in the context of intermediate-level courses in mechanics and electromagnetism, which often represent the first steps that physics and engineering majors take beyond the first-year sequence. Results from this research indicate that at certain situations students continue to hold deeply-seated alternate conceptions, while in other instances student responses suggest instead the presence of loosely or spontaneously connected intuitions. Furthermore, students often seem to have difficulty connecting the physics to the more sophisticated mathematics they are expected to use. This presentation will highlight some areas of physics education research being conducted with upper-level physics and engineering majors in the United States, including research conducted at Grand Valley State University, the University of Maine (by co-PI Michael Wittmann) and pilot sites in the *Intermediate Mechanics Tutorials* project. Results taken from the analysis of pretests (ungraded quizzes), written exams, and classroom observations, will illustrate specific student difficulties as well as the development and refinement of guided-inquiry teaching strategies to address these difficulties. (Supported by NSF grants DUE-0441426 and DUE-0442388.)

*Physics colloquium is scheduled for 2018-2019 academic year for every Thursday, 3:30 PM in LD 010. Changes to the schedule will be posted at

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