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Advanced lab initiatives: building on a rich diversity of programs and experiments[1]

RICHARD PETERSON, Bethel University, St. Paul, MN

The intermediate and advanced lab experience plays a critical role in preparing physics undergraduates for a diversity of careers and graduate school options. During the last few years AAPT, APS, and ALPhA (Advanced Laboratory Physics Association - http://www.advlab.org/) have been working together to invigorate these programs and to help network their instructors – including a 2009 2.5-day advanced lab topical conference at the University of Michigan 7/23-7/25 (http://advlabs.aapt.org/). Project oriented labs incorporating applications in engineering, acoustics, fluids, optical metrology and diagnostics, non-linear dynamics, biophysics, and nanoscience can play a broadly motivating role for students planning on REU or graduate work in applied physics areas. Experimental examples highlighted here include studies of mechanical resonance and shock wave phenomena utilizing holographic, Schlieren, and interferometric diagnostics – often in conjunction with MATLAB and COMSOL computational work.

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