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Advanced Physics Labs and Undergraduate Research: Helping Them Work Together[1]

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The 2009 Advanced Lab Topical Conference in Ann Arbor affirmed the importance of advanced labs that teach crucial skills and methodologies by carefully conducting a time-honored experiment. Others however argued that such a constrained experiment can play a complementary role to more open-ended, project experiences. A genuine "experiment" where neither student or faculty member is exactly sure of the best approach or anticipated result can often trigger real excitement, creativity, and career direction for students while reinforcing the advanced lab and undergraduate research interface. Several examples are cited in areas of AMO physics, optics, fluids, and acoustics. Colleges and universities that have dual-degree engineering, engineering physics, or applied physics programs may especially profit from interdisciplinary projects that utilize optical, electromagnetic, and acoustical measurements in conjunction with computational physics and simulation.

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