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Advanced teaching labs in physics – celebrating progress; challenges ahead

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A few examples of optical physics experiments may help us first reflect on significant progress on how advanced lab initiatives may now be more effectively developed, discussed, and disseminated - as opposed to only 10 or 15 years back. Many cooperative developments of the last decade are having profound impacts on advanced lab workers and students. Central to these changes are the programs of the Advanced Laboratory Physics Association (ALPhA) (Immersion, BFY conferences), AAPT (advlab-l server, ComPADRE, apparatus competitions, summer workshops/sessions), APS (Reichert Award, FED activities and sessions), and the Jonathan F. Reichert Foundation (ALPhA support and institution matched equipment grants for Immersion participants). Broad NSF support has helped undergird several of these initiatives. Two of the most significant challenges before this new advanced lab community are (a) to somehow enhance funding opportunities for teaching equipment and apparatus in an era of minimal NSF equipment support, and (b) to help develop a more complementary relationship between research-based advanced lab pedagogies and the development of fresh physics experiments that help enable the mentoring and experimental challenge of our students.