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J. J. Sakurai Prize for Theoretical Particle Physics Talk: Collider Physics: Yesterday, Today and Tomorrow
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More than a quarter century ago, theoretical issues with the Standard Model scalar boson sector inspired theorists to develop alternative models of electroweak symmetry breaking. The goal of the EHLQ study of hadron collider physics was to help determine the basic parameters of a supercollider that could distinguish these alternatives. Now we await data from the CMS and ATLAS experiments at CERN's Large Hadron Collider to solve this mystery. Does the Standard Model survive or, as theorists generally expect, does new physics appear (Strong Dynamics, SUSY, Extra Dimensions, ...)? Even well into the LHC era it is likely that questions about the origin of fermion mass and mixings will remain and new physics will bring new puzzles. This time, the associated new scales are unknown. The opportunity to address new physics at a future multi-TeV lepton collider is briefly addressed.