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From FACET to FACET-II: Accelerator R&D Facilities for SLAC's Future

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FACET operates as a National User Facility delivering unique beams to a diverse community of users. The evolution of FACET into the FACET-II test facility is proposed to provide the DOE with a unique capability to develop advanced acceleration and coherent radiation techniques with electron and positron beams. Based on efficient use of existing linac infrastructure, the facility will provide well-characterized 10 GeV beams of unmatched brightness to support development of accelerator techniques that will become the basis of future high energy physics colliders and photon science light sources. The science case for FACET-II has three primary elements: (1) high gradient acceleration techniques that will reduce the cost of both a future high-energy collider and linac-based light sources, (2) high brightness beam techniques that improve the generation, preservation, and application of such beams, and (3) wide-ranging experiments to develop and apply novel radiation techniques (spanning terahertz to gamma-rays) that can be generated by FACET's high brightness beams. This presentation will review our ideas for the facility and the user proposed scientific case.

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