

The Linac Coherent Lights Source, an X-Ray FEL at SLAC

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The Linac Coherent Light Source (LCLS) program involves a collaboration of six US National Laboratories and universities with the goal of designing and building the first 4th-generation hard x-ray source, an x-ray free-electron laser (FEL). This FEL will utilize extremely short, intense, low-emittance electron pulses created by the high-energy linear accelerator at the Stanford Linear Accelerator Center. The FEL radiation produced will feature unprecedented peak brightness, short pulse length, and spatial coherence, tunable over an energy range of 0.8 - 8 keV. With favorable funding, major construction will begin in 2005 and the LCLS will begin operating in 2008. The LCLS facility will include two experiment halls, with room for several experimental stations, but only one experiment will be active at a time. Proposed experiments range from atomic physics through chemistry and biology to materials science.