

Virtual Hard X-Ray Collaboration Seminar Series

Date: Thursday 2nd September 2021

Title: Towards a Cavity-Based X-Ray FEL at LCLS

Speaker: James MacArthur, SLAC

Abstract:

The combination of high rep-rate electron beams from superconducting accelerators and improvements in single crystal diamond x-ray optics has stoked interest in cavity-based XFELs (CBXFELs). CBXFELs have the potential to provide bright, fully coherent beams to users. The LCLS-II 1-MHz beam, for example, would be naturally matched to a 150 m long diamond x-ray cavity. With this in mind, a joint collaboration between SLAC, Argonne, and SPring-8 is developing CBXFEL technology for two-pass gain measurements using the two-bunch mode from the LCLS Cu linac. We will discuss this project and associated technical challenges. We will also discuss diamond mirror measurements and proof-of-principle ringdown measurements in a 21 m cold-cavity.