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## A Compact X-ray FEL project at Arizona State University

*Wednesday, 18 October 2023 10:00 (20 minutes)*

The CXFEL Project encompasses the Compact X-ray Light Source (CXLS) that is now commissioning in the hard x-ray energy range 4-20 keV, and the Compact X-ray Free-Electron Laser (CXFEL) designed to lase in the soft x-ray range 300-2500 eV. CXFEL has recently completed a 3-year design phase and just received NSF funding for construction over the next 5 years. These instruments are housed in separate purpose-built laboratories and rely on inverse Compton scattering of bright electron beams on powerful lasers to produce femtosecond pulses of x-rays from very compact linacs approximately 1 m in length. Both instruments use recently developed X-band distributed-coupling, room-temperature, standing-wave linacs and photoinjectors operating at 1 kHz repetition rates and 9300 MHz RF frequency. They rely on recently developed Yb-based lasers operating at high peak and average power to produce fs pulses of 1030 nm light at 1 kHz repetition rate with pulse energy up to 400 mJ. We present the current commissioning performance and status of CXLS. We also review the design and initial construction activities of the large collaborative effort to develop the fully coherent CXFEL.

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**Session Classification:** Morning session