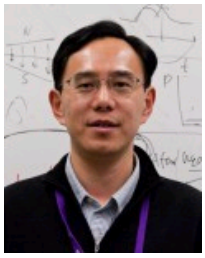
Department of Applied Physics



Zhirong Huang

Associate Professor of Photon Science, of Particle Physics and Astrophysics and, by courtesy, of Applied Physics

Directory Link
Personal Website

Research areas:
Accelerator Physics, Synchrotron Radiation, Ultrafast Science, X-Ray Physics

Description

Lasers and Accelerators

My research interests include high-brightness electron and photon beams, x-ray free-electron lasers and applications, advanced acceleration and radiation generation concepts. The understanding and exploration of how relativisitcs particles radiate and interact with the radiation has led to the remarkable growth of accelerator-based x-ray light sources that yield atomic spatical resolution and femtosecond temporal resolution of matter. A primer example is the world's first hard x-ray free-electron laser, the linac coherent light source (LCLS) at SLAC. My work centers on the research and development of the LCLS, the LCLS-II and future light sources.

Selected Publications

- Three-Dimensional Analysis of Harmonic Generation in High-Gain Free-Electron Lasers
- Measured Exponential Gain and Saturation of a SASE Free-Electron Laser
- Formulas for CSR Microbunching in a Bunch Compressor Chicane
- Suppression of Microbunching Instability in the Linac Coherent Light Source
- Review of X-ray FEL Theory
- Measurements of the LCLS Laser Heater and Its Impact on the X-ray FEL Performance
- Demonstration of self-seeding in a hard-X-ray free-electron laser
- Compact X-ray Free-Electron Laser from a Laser-Plasma Accelerator Using a Transverse-Gradient Undulator
- Laser-Electron Storage Ring
- First lasing and operation of an angstrom-wavelength free-electron laser

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