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**Beams by Design**

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Modern x-ray free election lasers (XFELs) use relativistic electron beams to produce intense pulses of radiation for probing nature down to Angstrom wavelengths and femtosecond timescales. A critical aspect of emerging XFELs is the capability to meet the increasing sophistication and demands of new science. I will discuss how novel new methods of "beam by design" are aimed at precisely tailoring x-ray FELs in a manner similar to the control that is demonstrated at optical wavelengths. Such manipulation techniques enable the production of nearly transform-limited x-ray pulses with tunable frequency and bandwidth, multiple colors, and orbital angular momentum for probing new physics.