



John Adams Institute for Accelerator Science Lecture Series

Thursday 12th June 2014 at 4:15pm
Fisher Room, Denys Wilkinson Building

Efficient Particle-In-Cell modeling of laser-driven plasma accelerators

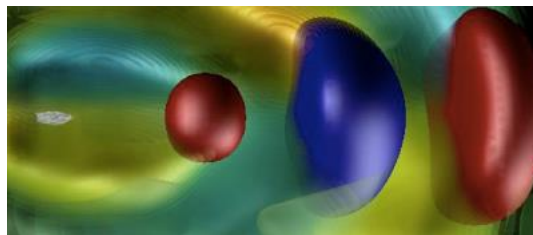
The lecture will be delivered by

Jean-Luc Vay,
Lawrence Berkeley National Laboratory

Abstract:

Numerical simulations have been critical in the recent rapid developments of advanced accelerator concepts. Among the various available numerical techniques, the Particle-In-Cell (PIC) approach is the method of choice for self-consistent simulations from first principles. The fundamentals of the PIC method were established decades ago but improvements or variations are continuously being published. We report on several recent advances in PIC related algorithms that are of interest for application to advanced accelerators, including the Lorentz boosted frame method, analytic pseudo-spectral electromagnetic solvers, PIC with mesh refinement and detailed analysis of the numerical Cherenkov instability. Examples of applications to the modeling of laser-driven plasma accelerators will be presented, including simulations of a novel two-color laser ionization injection scheme.

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