Abstract Submitted
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High-Performance Computer modeling of laser-plasma interactions.[1] JEAN-LUC VAY, Lawrence Berkeley Natl Lab — The workhorse algorithm for the modeling of laser-plasma interactions is the Particle-In-Cell (PIC) methodology, where particle beams and plasmas follow a Lagrangian representation with electrically charged macroparticles while electromagnetic fields follow a Eulerian representation on (usually Cartesian) grids. The complexity of the phenomena that often involve large ranges of space and time scales have driven the development of codes that run on the largest available supercomputers, and has also driven the development of novel algorithms. We will review the latest advances with examples of applications and discuss the challenges and efforts in preparation of upcoming exascale supercomputers.

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