

Abstract Submitted
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Exploring extreme plasma physics in the laboratory and in astrophysics¹ L. O. SILVA, T. GRISMAYER, R. A. FONSECA, F. CRUZ, F.D. GAUDIO, J.L. MARTINS, J. VIEIRA, M. VRANIC, GoLP/IPFN, Instituto Superior Tecnico, Universidade de Lisboa, Portugal — The interaction of ultra intense fields with plasmas is at the confluence of several sub-fields ranging from QED, and nuclear physics to high energy astrophysics, and fundamental plasma processes. It requires novel theoretical tools, highly optimised numerical codes and algorithms tailored to these complex scenarios, where physical mechanisms at very disparate temporal and spatial scales are self-consistently coupled in multidimensional geometries. The key developments implemented in Osiris will be presented along with some examples of problems, relevant for laboratory or astrophysical scenarios, that are being addressed resorting to the combination of massively parallel simulations with theoretical models. The relevance for near future experimental facilities such as ELI will also be presented.

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