Name of submitting author	Dr. Michael Bussmann
Institution	Helmholtz-Zentrum Dresden-Rossendorf
Email	m.bussmann@hzdr.de
Abstract Title	Frames per Second Laser Plasma Simulations - Making large scale simulations really fast ... or slow
Author/Affiliation listing	Michael Bussmann - Helmholtz-Zentrum Dresden Rossendorf
Abstract	We present PIConGPU, a particle-in-cell code running on large GPU clusters. Take a glimpse at how many-core architectures will change the way of accelerator physics simulations.
Summary	
Many-core compute architectures such as graphic cards will be the building blocks of next-generation Exaflop computers. With these architectures, complex laser plasma simulations can run on a frames-per-second rate, decreasing the waiting time to get results to hours instead of weeks. Thus, large surveys for optimum acceleration parameters come in reach. This will enable theoreticians and experimentalists to discuss and understand the physics behind particle acceleration scenarios instead of simply adding a few pretty simulation pictures to a publication. When considering future applications of ultra-intense lasers, new physics will have to be taken into account. It is thus not only mandatory to make simulations fast, but to then add new physical effects into the code. This will require new strategies to leverage the power of next-generation supercomputers. We propose potentially successful techniques to get the most out of upcoming HPC systems based on our experience with PIConGPU and show what is already possible today.	

Name of submitting author	Gerard Andonian
Institution	UCLA
Email	gerard@physics.ucla.edu
Abstract Title	Electron-beam-driven dielectric accelerators
Author/Affiliation listing	G. Andonian, J. Rosenzweig, O. Williams, S. Barber, B. O'Shea, D.Stratakis (UCLA), M. Babzien, M. Fedurin, K. Kushce, V. Yakimenko (BNL), M. Hogan, C. Clarke (SLAC), P. Muggli (MPI)
Abstract	This talk will review the experimental progress on beam-driven, dielectric wakefield acceleration including studies of breakdown limits, generation of narrowband, tunable terahertz radiation, selective harmonic excitation, novel materials and structure geometries, and recent reports of observation of energy modulation for sub-mm scale structures.
Summary	
In recent years, there has been rapid experimental progress on using the self-fields of electron beams to drive accelerating gradients in dielectric lined cavities. The extension to sub-mm scaled cavities, producing terahertz frequencies, has allowed an accessible region to study high-gradient structures in many advanced accelerator facilities. In this talk, we will present a broad review of such results as they pertain to dielectric wakefield acceleration (DWA). Issues that will be discussed include the examination of breakdown in such structures and materials, as well as studies of in-line spectra generated by coherent Cerenkov radiation, which, for appropriate geometries, produce narrowband, tunable terahertz radiation. We will examine measurements of higher-order mode excitations in these structures, which provide a novel characterization method as well as a tunable source of terahertz radiation. We will describe DWA measurements including wakefield mapping, selective resonant mode excitation, and observation of energy modulation and acceleration made possible by electron beam manipulation schemes, such as drive-witness, pulse-train, and ramped beam generation. Finally, we will discuss alternate materials and geometries, for sophisticated 1D and 3D photonic-like structures.	

Name of submitting author	Dr Gil Travish
Institution	UCLA
Email	travish@physics.ucla.edu
Abstract Title	PLENARY: Dielectric Laser Accelerators: Are they viable advanced accelerator concepts?
Author/Affiliation listing	Gil Travish UCLA Department of Physics & Astronomy, Los Angeles, CA 90095
Abstract	My presentation will ask what role Dielectric Laser Accelerators (DLAs) can play in particle beam applications. I will review the current progress in laser powered dielectric structures, and suggest what are the critical steps remaining to validate this class of advanced accelerators.
Summary	
Dielectric Laser Accelerators (DLAs) have promised GV/m gradients in chip-scale structures with scalable manufacturing. A review of the progress in this field will be presented and attempt to answer what can be expected from these devices. A summary of critical hurdles overcome and those remaining will also be discussed. DLAs come in several variants and a taxonomy may be useful as will characterization by end use. The capabilities of DLAs already seem to be rather distinct from conventional accelerators both in the time structure of the beams produced as well as the physical scale of the devices. The implications of this new operating regime for accelerators will be considered for light sources, colliders, and non-research applications.	