

Abstract Submitted
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Ultra-High Intensity Laser Research at BELLA¹ SVEN STEINKE, JIANHUI BIN, ANTOINE SNIJDERS, JIAN-HUA MAO, QING JI, KEI NAKAMURA, ANTHONY GONSALVES, STEPAN BULANOV, CAMERON GEDDES, CARL SCHROEDER, THOMAS SCHENKEL, ELEANOR BLAKELY, ERIC ESAREY, Lawrence Berkeley National Laboratory, LBNL TEAM — This presentation will review the status of ion acceleration at the BELLA petawatt (PW) facility with a large laser spot (f5) and give an outlook on science enabled by a short-focal length (f.5) laser beamline, currently under construction. Proton beams from the long-focal length beam line exhibit a strongly reduced divergence and increased ion numbers and are hence, ideally suited for subsequent capture and transport with an active plasma lens (APL). As part of our development of an experimental platform for investigating radiobiological effects of laser-accelerated ions, we were able to irradiate normal and radioresistant prostate cancer tumor cell samples with over 1500 PW shots using the APL. The new the short-focal length beamline will be equipped with a re-collimating double-plasma mirror to study laser-plasma interactions at ultra-high temporal contrast. The BELLA center is now part of LaserNetUS, providing international user access.

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Sven Steinke
Lawrence Berkeley National Laboratory

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