Contribution ID: **640** Type: **Poster (student)**

Development of a high charge 10 GeV laser electron accelerator

Recent all-optical multi-GeV laser wakefield acceleration (LWFA) demonstrations have been enabled by University of Maryland's development of meter-scale supersonic gas jets and low-density plasma waveguides. This poster presents a review of our recent LWFA efforts, including gas jet development, experiments and simulations to benchmark plasma waveguide generation, a new 3-stage model for relativistic pulse propagation in meter-scale waveguides, and recent high efficiency LWFA experiments. These experiments demonstrate sub-milliradian divergence electron bunches with integrated charge >1nC above 1 GeV, and energy spectra including ⊠ 10 pC features of ~10 GeV, representing a laser to electron conversion efficiency of at least ~30%.

Primary author: ROCKAFELLOW, Ela (University of Maryland)

Co-authors: Dr MIAO, Bo (University of Maryland); SHROCK, Jaron (University of Maryland, College Park); SLOSS, Ari (University of Maryland); LE, Manh (University of Maryland); Dr HANCOCK, Scott (University of Maryland); Dr ZAHEDPOUR, Sina (Colorado State University); Dr WANG, Shoujun (Colorado State University); Dr HOLLINGER, Reed (Colorado State University); Dr KING, James (Colorado State University); Dr ZHANG, Ping (Colorado State University); GRITTANI, Gabriele Maria (ELI-Beamlines); SISMA, Jiri (ELI Beamlines); VERSACI, Roberto (ELI-Beamlines); Dr GORDON, Daniel (Naval Research Laboratory); Dr WILLLIAMS, Jackson (Lawrence Livermore National Laboratory); Dr REAGAN, Brendan (Colorado State University); Prof. ROCCA, Jorge (Colorado State University); MILCHBERG, Howard (University of Maryland)

Presenter: ROCKAFELLOW, Ela (University of Maryland)

Session Classification: Poster Session

Track Classification: PS1: Plasma-based accelerators and ancillary components