Physics colloquium

Optical fiber technologies for commercial and high energy physics applications

Leily Kiani
Postdoctoral Researcher, DoD Technologies
National Ignition Facility & Photon Sciences
Lawrence Livermore National Lab

Date: **9/7/18**
Time: **10:30 AM**
Location**: COB1 263**

For more information contact:
Jay Sharping
jsharping@ucmerced.edu

ABSTRACT: This talk will present an overview of the fiber fabrication capabilities at Lawrence Livermore, results on a novel fiber design for amplification in the E-band and finally the status of a new project investigating sources of temporal contrast degradation in ultrashort fiber laser systems. Fiber fabrication at Livermore is performed via the stack-and-draw process which enables the production of highly microstructure optical fibers adding functionality beyond typical step-index fibers. A wavelength selective microstructure has been applied to Nd doped fibers which has enabled both a core-pumped amplifying fiber for telecom applications and a high-power dual-clad fiber. This talk will give details on the optical fiber production and show results on an amplifier and tunable laser built with this unique fiber. This talk will also give an overview of a new collaborative project, sponsored by the DOE Office of Science, aiming to apply beam combinable fiber amplifier arrays as a source for next generation particle accelerators. The LLNL component of the collaboration is the optimization of a single fiber amplifier channel with respect to the temporal contrast of ultrashort laser pulses it produces. The talk will present our approach to investigating heretofore unknown contributors to the development of low temporal contrast.

BIO: Leily Kiani joined the Fiber Technologies Group at Lawrence Livermore National Laboratory as a postdoctoral researcher in August 2016. Since joining LLNL, Leily has worked on rare-earth doped fiber lasers enabled by waveguide filtering microstructures and solid-state parametric devices for generation of coherent mid-infrared light. More recently she has been working on developing fiber lasers for applications to laser driven particle accelerators. She has served as PI on two projects and her proposal to apply the E-band amplifier technology to the Smart Grid was recently awarded by DOE Office of Technology Transitions. She earned her Ph.D. in 2015 at University of California, Merced in the Applied Photonics Research Group led by Prof. Jay Sharping. Her research projects converged on the development of microstructure fiber-optical parametric devices for application to continuum generation, biological imaging and nonclassical light. Leily was a pioneer bobcat and joined Prof. Sharping's research group as an AGEP scholar in 2008.