The 11th Annual Exhibition of Undergraduate Research and Creative Activities - EXPO 2024

GUEST SPEAKER

Benjamin Webb, Ph.D.

Laser Scientist - Laboratory for Laser Energetics
University of Rochester

April 18, 2024 - 1:00 to 1:45 p.m.
Live Oak Ballroom - Setzer Center

SHORT BIOGRAPHY:

Benjamin Webb is a scientist in the Laser Technology Development group of the Laboratory for Laser Energetics (LLE) at the University of Rochester in New York. His current research interests include chirped-pulse amplification system design, laser characterization, and temporal contrast enhancement. He received a BS in electrical engineering in 2009 from Lamar University. Webb received MS and PhD degrees in optics and photonics from CREOL at the University of Central Florida in 2011 and 2016 respectively. He is a senior Optica member and recently served four years as an executive committee member for the Short Wavelength Sources and Attosecond/High Field Physics (OH) technical group. Webb lives in Rochester, NY with his wife, Lyric, and their three children.

LECTURE: Temporal Contrast Degradation in High-Intensity Lasers

Experiments on a 0.35-PW high-intensity laser reveal multiple temporal noise sources which overlap like the layers of an onion around the main pulse, degrading the temporal contrast. Pre-pedestal generation from a post-pedestal via instantaneous gain and pump depletion in an optical parametric amplifier is demonstrated for the first time. A different pedestal generation mechanism is studied, where nanometer-scale mirror roughness is spatiotemporally coupled. Features protruding above this pedestal are discovered to originate from mid-spatial frequency errors commonly produced in computer-numerically controlled polishing processes. Matching simulations support conclusions and enhance the understanding of these processes.

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