## Holography diagnostics for 3D spray drop localization, velocimetry, and sizing

Liquid sprays are comprised of a large population of droplets whose local concentrations, sizes, and velocities are of paramount interest for the design and optimization of system performance. This has motivated a wide range of experimental diagnostics to quantify spray droplets. This talk will review laser holography, which enables three-dimensional (3D) characterization of drop locations, velocities, and sizes. Discussion will begin with an overview of historical developments. Then, we will discuss the recent proliferation of digital holographic methodologies. Techniques, diagnostic advantages, measurement challenges, and several applications to sprays and atomization will be considered. Finally, we will highlight recent advancements that extend holography to extreme measurement environments.

Bio:

Daniel R. Guildenbecher is an Associate Professor of Mechanical Engineering at Purdue University. He was previously a research staff member at Sandia National Laboratory (2011-2023). Dr. Guildenbecher's research develops experimental diagnostics of multiphase and combusting flows, including applications to liquid sprays, explosives, energetics, and propulsion. Dr. Guildenbecher received his Ph.D. in Mechanical Engineering from Purdue University in 2009. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics and a Member of the Optical Society of America.