

The Woodruff School of Mechanical Engineering

Mechanical Engineering Seminar

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School of Aerospace Engineering
Georgia Institute of Technology**

Dynamics of Acoustically Forced, Premixed Flames

Combustor instabilities pose one of the key problems associated with ultra low emissions, combustion based energy conversion devices. The key processes associated with these instabilities are flame interactions with a harmonically oscillating acoustic field. This talk will describe the key physical processes that control the flame response to these oscillations. In particular, it addresses the question, "For a given flow disturbance, U' , what is the resultant heat release fluctuation, Q' ". Results from laser based experimental studies, analysis, and level set based computations will be presented to provide a comprehensive overview of current understanding of this problem.

Brief Bio:

TIMOTHY LIEUWEN is an Associate Professor at the Georgia Institute of Technology. He received his B.S. (1995) from Calvin College (Grand Rapids , MI) and his M.S. (1997) and Ph.D. (1999) from Georgia Institute of Technology. Dr. Lieuwen joined the Georgia Tech School of Aerospace Engineering faculty as an Assistant Professor in 1999 and was promoted to Associate Professor in 2004. Dr. Lieuwen is the author of 2 book chapters, 40 refereed journal articles, and over 100 conference publications. He is an Associate Editor of the Journal of Propulsion and Power, a leading aerospace journal. Dr. Lieuwen has held various leadership roles in the Air Breathing Propulsion technical committee of the American Institute of Aeronautics and Astronautics (AIAA) and the Combustion and Fuels committee of the American Society of Mechanical Engineers (ASME). He has served on a variety of panels with the US DOE, NASA, and NRC. Dr. Lieuwen's awards include the NSF CAREER Award, the AIAA Lawrence Sperry Award, and the ASME/IGTI Turbo Expo Best Paper Award.