

AEROSPACE & MECHANICAL ENGINEERING



**2012 COLLOQUIUM 2013
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UNIVERSITY OF NOTRE DAME, NOTRE DAME, INDIANA 46556

MIDWEST MECHANICS SEMINAR

SPEAKER: Professor Tim Colonius
Department of Mechanical and Civil Engineering
California Institute of Technology
Pasadena, California

TOPIC: WAVE PACKETS AND TURBULENT JET NOISE

DATE: Wednesday, October 31, 2011

TIME: 3:30 p.m.

PLACE: Hesburgh Library Auditorium

RECEPTION: 3:00 – 3:25 p.m. – Hesburgh Library Auditorium

ABSTRACT

After a brief review of the status and relevance of jet noise, we discuss wavepacket structures that are observed in the near pressure field of turbulent jets, and their relation with the radiated acoustic field. These wavepackets have been observed for many years, but their importance to the far-field noise is still debated, particularly in subsonic jets. We use the linear Parabolized Stability Equations (PSE) to model the wavepacket structures; the results provide excellent quantitative agreement with the spatial distribution of wavepacket amplitude and phase from a microphone array, especially when the microphone data are processed to filter out contributions associated with uncorrelated fluctuations. Far-field sound predictions based on linear PSE are also in reasonable agreement with far-field data. We extend the theory to jets from serrated nozzles, and conclude by describing current research efforts to use wave packet models to devise jet noise control strategies.

**NOTE: If you are interested in meeting individually with
Prof. Colonius please contact Linda at 631-5431.**