

***DISTINGUISHED
LECTURER SERIES***

***VCU
MECHANICAL ENGINEERING***

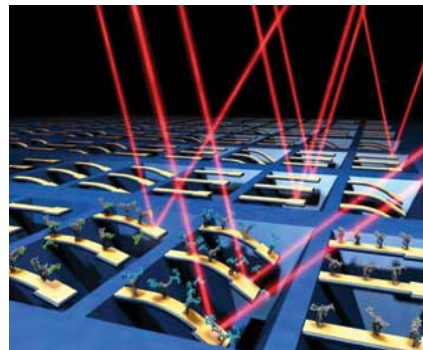
***Computational
Aeroacoustics
in a Model of the
Human Vocal Tract***



***Professor Steven Frankel
Purdue Univeristy
12 November 2007
Social Hour: 11:30-12:00 noon
Seminar: 12:00-1:00 pm
Room 106
Engineering Building***

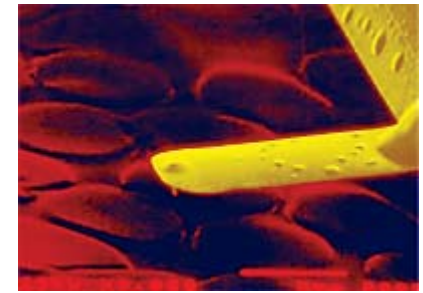
ABSTRACT

This talk will focus on using computational aeroacoustics to better understand flow and acoustic features within the human vocal tract as they relate to phonation (voiced speech). The large eddy simulation turbulence modelling approach, combined with high-fidelity numerical methods and parallel computing, will be used to accurately and efficiently solve the compressible Navier–Stokes equations in a model of the human vocal tract. Both direct computations and hybrid methods will be used to predict vocal tract acoustics. Comparisons to available experimental data, as well as more traditional turbulence models, will be presented for validation purposes. Aspects related to fluid–structure interaction will also be addressed, pointing out a direction for future work.



BIO

Professor Frankel received his B.S. in Mechanical and Aerospace Engineering from the State University of New York at Buffalo in May 1988. He spent the summer of 1988 as an intern at the von Kármán Institute for Fluid Dynamics in Belgium where he worked on turbulence modeling and CFD. He received his M.S. in Mechanical and Aerospace Engineering from the North Carolina State University in May 1990 where he worked under Dr. H. A. Hassan on assumed probability density function methods for modelling supersonic combustion in scramjet engines. During his M.S. he spent summers at the NASA Langley Research Center in Hampton, Virginia in the Theoretical Flow Physics Branch under Dr. Phil Drummond. He returned to SUNY at Buffalo in August 1990 and received his Ph.D. in May of 1993 where as a visiting lecturer he worked on direct numerical simulation (DNS), large eddy simulation (LES) and probability density function (PDF) methods for turbulent reacting flows under Dr. Peyman Givi. In August of 1993 he joined the faculty of the School of Mechanical Engineering at Purdue University, West Lafayette, Indiana, as a tenure-track Assistant Professor. He was promoted to Associate Professor with tenure in August 1999 and to Professor in August 2004. His research interests include modeling and simulation of turbulent flows with an emphasis on the development and application of LES to turbulent reacting flows, aeroacoustics, multiphase, and biological flows.



***Contact:
Mechanical Engineering
School of Engineering
Virginia Commonwealth
University
601 West Main St
Richmond, VA 23284-3015
Office: 804-828-9117
Fax: 804-827-7030***

