Date: **October 21st, 2005**

Time: **11:00 AM**

Location: **Maryland Hall 110**

Speaker: **Dr. Elias Balaras**
Department of Mechanical Engineering
University of Maryland

Title: **"Large-Eddy Simulations of turbulent flows interacting with dynamically moving boundaries"**

Abstract

Over the past decade due to the rapid increase in computer power, the large-eddy simulation (LES) approach has emerged as a valuable tool for turbulence research and has contributed invaluable information on the structure and dynamics of a variety of flows which are of engineering interest. There are, however, applications from biology and physiology where the use of LES has received considerably less attention as a result of exceedingly complex fluid/structure interactions that dominate the dynamics of such flows, but the potential rewards if one were successful are great. In this seminar computational algorithms suitable for LES of the above class of flows will be discussed. Particular emphasis will be given on an embedded boundary formulation we have recently developed, where the fluid flow equations are solved on a fixed grid that does not conform to the structure, and boundary conditions are imposed using local reconstructions. The structure that undergoes both linear-elastic and large-angle/large-displacement rigid body motions is strongly coupled to the fluid using a predictor-corrector approach. Results for both laminar and complex turbulent flow problems will be discussed.