

Date: October 19th

Time: 11:00 AM

Location: Maryland Hall 110

Speaker: Dr. Manoochehr Koochesfahani

Michigan State University

Title: *"Boundary-layer resolved measurements of Unsteady Separation using Molecular Tagging Velocimetry (MTV)"*

Abstract

A brief overview of molecular tagging diagnostics will be presented, along with results from two studies involving unsteady boundary layer separation. Molecular tagging methods take advantage of molecules that can be turned into long lifetime tracers upon excitation by photons of an appropriate wavelength. Typically a pulsed laser is used to “tag” the regions of interest, and those tagged regions are interrogated at successive times within the lifetime of the tracer. This approach has been utilized to date for the measurement of velocity and temperature fields.

MTV measurements of unsteady flow separation are described for two flow fields. The first study is that of a vortex ring impinging on a flat wall, whereas the other considers unsteady flow separation from the leading edge of an airfoil pitching to a high angle of attack. The details of the separation process will be discussed using boundary-layer resolved data and comparison with complementary computations will be presented. The similarity between the separation-process in the two flow fields will be illustrated.