

## **Weekly Seminar: Spring 2011**

Date: **Friday, January 21, 2011**

Time: 11:00 AM

Location: Latrobe Hall 106

Speaker: Hui Hu (Iowa State University)

Title: *"Development of Advanced Flow Diagnostic Techniques to Study Complex Thermofluid Phenomena."*

### **Abstract**

The talk will start with the description of the recent progress made by the speaker in developing molecule-based flow diagnostic techniques such as Molecular Tagging Velocimetry and Thermometry (MTV&T) and Pressure Sensitive Paint (PSP) techniques to study complex fluid flow and heat transfer phenomena. The unique glamour of the molecular-based diagnostic techniques will be demonstrated from the application examples to study the thermal effects on the wake instabilities behind a heated cylinder, transient behavior of electroosmotic flows in electrokinetically-driven microfluidics, quantifications of cooling effectiveness of the trailing edge cooling designs of gas turbine blades, visualization of the unsteady heat transfer and phase changing process within micro-sized icing water droplets for aircraft or wind turbine de-/anti- icing applications. The second part of the talk will give a brief introduction about some ongoing research projects in the speaker's laboratory, which include quantifications of dynamic wind loads and evolution of tip vortex in the wake of a wind turbine in an atmospheric boundary layer; bio-inspired aerodynamic designs for Micro-Air-Vehicle applications; and fluid-structure interactions around building models in tornado-like swirling winds.