



2009 Mechanical Engineering Special Seminar



The Department of Mechanical Engineering is pleased to host



Mehdi Raessi

Postdoctoral Fellow

Stanford University

Numerical Modeling of Interfacial Flows with Applications to Drop Dynamics and Liquid Atomization

October 6, 2009 | DEWALT Seminar Room, 2164 Glenn Martin Hall | 2:00 pm

Abstract: Interfacial flows are an integral part of many engineering disciplines including energy systems, naval hydrodynamics, liquid cooling of electronic components, spray coating and cooling. Numerical simulations are clearly emerging as a powerful tool for analyzing such flows. They are cost-effective means to complement and leverage experimental knowledge base. In this presentation, I will focus on two important engineering technologies: thermal spray coating and liquid atomization processes in which interfacial flows play an important role. I will present numerical simulations of impact and solidification of droplets onto patterned surfaces, and will discuss how surface patterns can influence the drop dynamics. Then, I will present recently developed numerical methodologies for more accurate and faster simulations of interfacial flows in which surface tension is a dominant force. Finally, I will discuss a new method for accurate modeling of interfacial flows characterized by large density ratios, and will give an example of its unique ability to model flows with realistic density ratios.

Biography: Mehdi Raessi is a postdoctoral fellow at Stanford University in the Department of Mechanical Engineering. He received his PhD in Mechanical Engineering at the University of Toronto in 2008, and immediately joined the Center for Turbulence Research at Stanford. His research focus is the numerical simulation of interfacial flows in various engineering applications, and on the development of numerical methods for modeling interfacial flows.

For more information, please visit: www.enme.umd.edu

Dr. Raessi will be hosted by Professor Jim Duncan of Mechanical Engineering