

The Department of
Mechanical Engineering
PRESENTS

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Friday, October 30, 2015
WCH Room 205/206
11:10-12:00PM

***Flow Physics and Thermal Transport at
Superhydrophobic Walls***

Abstract:

Superhydrophobic (SH) surfaces consist of the combination of nano- or microscopic surface patterning with a hydrophobic coating. Such surfaces dramatically alter the interfacial dynamics between liquid and solid phases and subsequently yield flow physics and thermal transport behavior that is markedly different from a traditional smooth hydrophilic surface. Liquid in contact with a SH surface wets only a fraction of the solid surface, provided the pressure is not too high. Subsequently, large reductions in the overall flow resistance can be achieved and apparent velocity and temperature discontinuities exist at the plane of the surface. This presentation will address the flow dynamics (in laminar and turbulent flow regimes) and thermal transport associated with liquid interacting with SH surfaces. We will consider droplets, either impinging or at rest, liquid jets impinging normally on SH surfaces, and completely submerged surfaces in both laminar and turbulent flow regimes. The influence on the overall flow and convective thermal transport characteristics will be explored in terms of the important dimensionless parameters.

About the Speaker:

Professor Maynes is a Professor and the Chair of the Department of Mechanical Engineering at Brigham Young University where he has been on the faculty since 1997. He received his Ph.D. from the University of Utah, where, prior to his appointment at BYU he was a post-doctoral research professor and instructor. He received the B.S. and M.S. degrees in Mechanical Engineering from Utah State University in 1992 and 1993, respectively. Other experience includes employment with the Space Dynamics Laboratory and Argonne National Laboratory. He has published extensively on the research he has directed, being an author on over 150 scientific papers and presentations. During his time at BYU he has advised 34 graduate students and has directed over five million dollars in externally sponsored research contracts and grants. At BYU he has received numerous Department and College teaching and research awards.