

The Department of Mechanical Engineering presents:

The Master's Dissertation Defense of:

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Tuesday, July 26, 2011, 10:00AM - 11:30AM
Bourns Hall A171

**Thermal Performance and Operational Attributes of the
Startup Characteristics of Flat-Shaped Heat Pipes using
Nanofluids**

By

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University of California, Riverside, July 2011
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Thermal performance and start-up characteristics of flat-shaped heat pipes using nanofluids, is analyzed in this work. Transient behavior, performance, and operational characteristics of flat-shaped heat pipes using nanofluids as the working fluid are investigated in this work. Three different primary nanofluids namely,, and were utilized in our analysis. A comprehensive analytical model, which accounts in detail the heat transfer characteristics within the pipe wall and the wick within the condensation and evaporation sections, was utilized. The results illustrate enhancement in the heat pipe performance while achieving a reduction in the thermal resistance of both flat-plate and disk-shaped heat pipes throughout the transient process. It was shown that a higher concentration of nanoparticles increases the thermal performance of either flat-plate or disk-shaped heat pipes. We have also established that for the same heat load a smaller size flat-shaped heat pipe can be utilized when using nanofluids.