

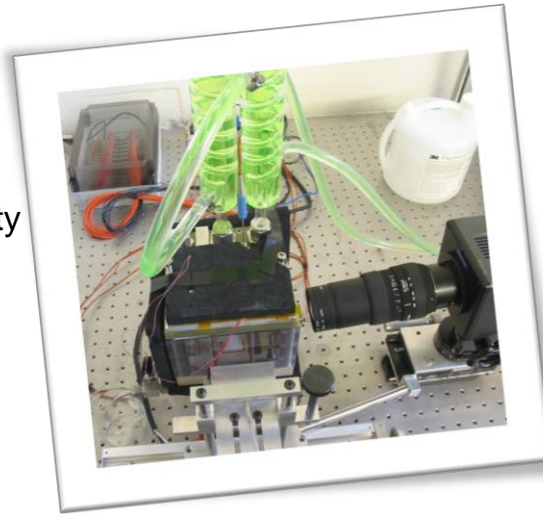
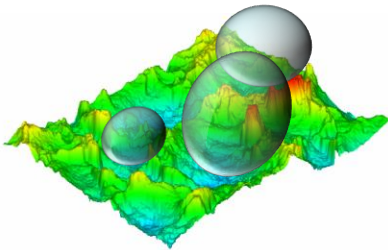
# Effects of Surface Roughness and Wettability on Nucleate Boiling Heat Transfer

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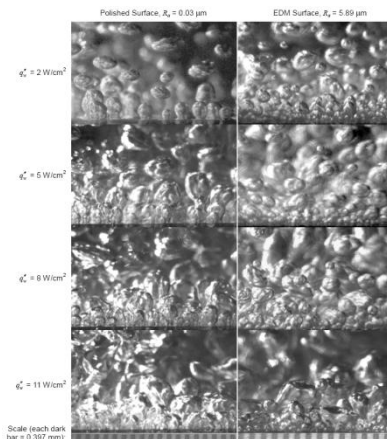
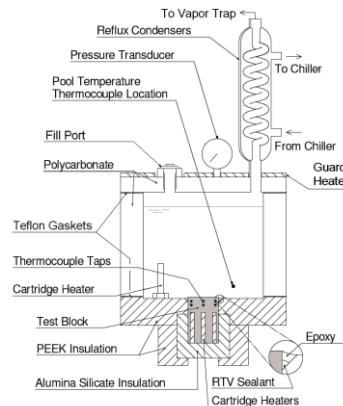
## OBJECTIVE

Quantify the effect of random surface roughness on nucleate boiling characteristics for a variety of conditions.



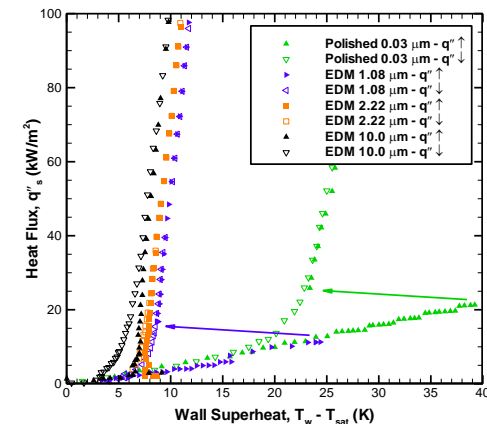
## APPROACH

- Random surface roughness produced by consistent method
- Wide range of surface roughness
- Working fluids include different wetting characteristics



## IMPACT

- Quantify bubble nucleation characteristics from realistic surfaces in a statistically meaningful way
- Improve modeling of nucleate boiling heat transfer
- Assist in improved modeling of two-phase flow at the microscale
- Develop high-speed digital measurement techniques for bubble geometry near surfaces



## SELECTED PUBLICATIONS

- B.J. Jones, S.V. Garimella, 2007, "Effects of Surface Roughness on the Pool Boiling of Water," 2007 Proc. 5th Joint ASME/JSME Fluids Engineering Conference, paper no. HT2007-32230.
- J.P. McHale, S.V. Garimella, 2008, "Measurements of Bubble Nucleation Characteristics in Pool Boiling of a Wetting Liquid on Smooth and Roughened Surfaces," Proc. 2008 ASME Summer Heat Transfer Conference, paper no. HT2008-56179.
- B.J. Jones, J.P. McHale, S.V. Garimella, 2009, "The Influence of Surface Roughness on Nucleate Boiling Heat Transfer," Journal of Heat Transfer (in press).