Department of
MECHANICAL ENGINEERING
THE UNIVERSITY OF UTAH

ME 5960-6960 Nanoscale Heat Transfer (Fall 2011)

Instructor:
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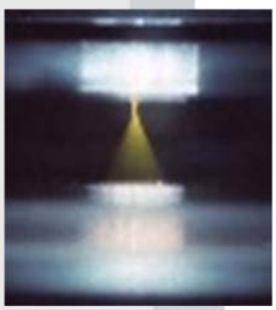
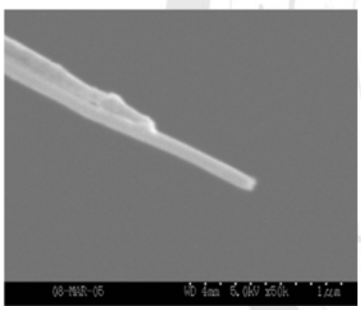
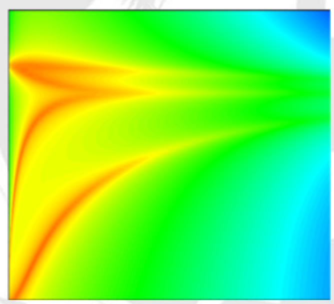
Schedule:
TH 10:45 am – 12:05 pm

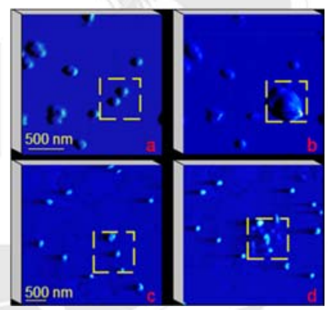
Prerequisite:
ME EN 3650 (Heat Transfer)

Textbook:
Zhuomin M. Zhang, Nano/Microscale Heat Transfer, McGraw-Hill, 2007.









Summary:
Traditional macroscale thermal science is based on classical equilibrium and continuum assumptions. These assumptions break down at the molecular and atomic length scales, and the classical theories, such as Fourier's law for heat conduction or Planck's blackbody distribution for radiation, are no longer applicable at micro/nanoscale. With the major progress over the past two decades in controlling matter at nanoscale, nanotechnology is becoming an integral part of almost all engineering disciplines. This course will provide a self-contained overview of thermal transport and thermophysical properties at nanoscale, and will introduce the elements of quantum mechanics, solid state physics, statistical thermodynamics, and electrodynamics necessary to understand these phenomena.