

**Seminar**  
**“Modeling and Sensing Techniques  
for Thermal Analysis of Microsystems”**

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**4:30 PM on Wednesday, March 28 in BR 3216**

*Abstract*

The development of micro/nano fabrication technology has enabled the size of many engineering devices to shrink significantly over the past two decades. Among these are many micro thermal systems where fluid flow and heat transfer play an important role. These include micro heat exchangers, micro heat pipes, micro total analysis systems, micro pumps, ink jet heads, and so on. This talk is intended to present a method for modeling transport phenomena in microstructures. It is followed by three types of micro-sensors developed for experimental investigation of fluid flow and heat transfer in microstructures. The modeling technique based on the averaging method is applied to thermal design and optimization of a microstructure. The micro-sensors can be used to measure the temperature distribution at the surface of a microstructure and the mass flow rate passing through it. Some of the latest micro thermal systems will be discussed with examples of application.

*Presenter*

Dr. Sung Jin Kim is a Full Professor in the Department of Mechanical Engineering at the Korea Advanced Institute of Science and Technology (KAIST). Until he took a teaching position at KAIST in July 1997, he was a group leader of Thermal Engineering Center at the IBM Tucson Laboratory for 7 and 1/2 years. He was responsible for the investigation and development of advanced cooling techniques for application to electronic systems. He received a Ph.D. degree in Mechanical Engineering from the Ohio State University in 1989. He has received Excellent Achievement Award from KSME, Excellent Teaching Award from KAIST, two Invention Achievement Awards and five Author Recognition Awards from IBM, holds 4 patents, and has published more than 40 papers in the area of convective heat transfer.