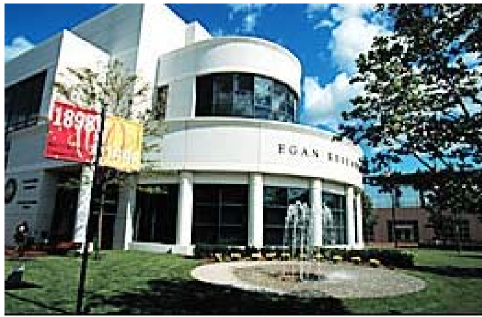
NU Mechanical and Industrial Engineering Colloquium Series – FALL 07
WEDNESDAY Oct 10, Shillman 415



SEMINAR TITLE

"Challenges in Electronic Cooling"

SEMINAR SPEAKER

Professor Dereje Agonafer

Visiting Professor

Massachusetts Institute of Technology

PROGRAM

11:50 - 12:00 p.m. Pre-seminar/Intro
12:00 - 12:50 p.m. Lecture (typical)
12:50 - 1:00 p.m. Q&A and Discussion

ABSTRACT

As the Electronic Packaging industry develops technologies for fabrication of smaller, faster, economical and reliable products; thermal management and design play an important role. Following Moore's Law, the number of transistors on a single "high density interconnect" die has exceeded a billion. The feature size of the die, however, is not changing much leading to a significant increase in power density. Coupled with the increased dynamic power, is the fast increasing static power caused by leakage current (the gate oxide thickness for 90nm nodes is only 1.2nm). The push for multi-core processors and high k dielectric is directly attributed to this leakage current.

In this seminar, Dr. Agonafer will discuss some of his current research areas in thermo/mechanical challenges in electronics cooling/packaging. He will start the seminar with a promising stacked packaging approach and the related thermo/mechanical challenges. He will also briefly address some of their current work on optimization of functional block power distribution to reduce internal resistance, analytical thermal model for a typical flip chip package, bump electromigration, lead free solders and finish the presentation with some discussion on data centers and related energy management

BIOGRAPHIC PROFILE

After 15 years at IBM, in 1999, Dr. Dereje Agonafer joined the University of Texas at Arlington as Professor and Director of Electronics, MEMS, and Nanoelectronics Systems Packaging Center. In April 1998, Professor Agonafer was the recipient of the "The University of Colorado Distinguished Engineering Alumni Award (DEAA) in the category of Research and Invention." In November 1998, he received "The Howard University Distinguished PhD Alumni Award" and also received "ASME K-16/EEPD Clock Award for Outstanding Contribution in Computer Aided Thermal Management of Electronic Packages." In 2002, he received ASME International Electronic and Photonic Packaging Division Highest Division Award for "Outstanding Contributions to the Area of the Application of the Science and Engineering of Heat Transfer to Electronic and Photonic Packaging." Currently the Editor in Chief of ASME Press Book Series in Electronic Packaging and Associate Editor of the Journal of Electronic Packaging. From 1997 - 2000, he served as Chair of the ASME K-16 Committee in the Heat Transfer Division. Professor Agonafer is a *Fellow of the American Society of Mechanical Engineers International* and a *Fellow of American Association for the Advancement of Science*. He is currently the Dr. Martin Luther King Visiting Professor at MIT in the Mechanical Engineering Department.

For further information, contact the Department of Mechanical & Industrial Engineering, 334 Snell Engineering Center, Northeastern University, 360 Huntington Avenue, Boston, MA, 02115. Tel: (617) 373 2186; (Fax) 617 373 2921.