K-16 Committee
Heat Transfer in Electronic Equipment
A joint committee of the Heat Transfer Division (HTD) and the Electrical and Electronic Packaging Division (EEPD)

(All contact info is current as of July 2009 unless otherwise noted)

Chair	
Amy S. Fleischer, Ph.D. Associate Professor of Mechanical Engineering Director, NovaTherm Laboratory Dept. of Mechanical Engineering Villanova University Villanova, PA 19085 **TEL: (610) 519-4996** **(610) 519-4996** **Email:** amy.fleischer@villanova.edu	Research interests: phase change materials, transient thermal management of electronics, nanomaterials, carbon nanotubes, carbon nanofibers, two phase flow, jet impingement cooling, experimental and numerical heat transfer
Vice Chair	
Gamal Refai-Ahmed, Ph.D. Fellow ASME AMD Fellow and Chief Thermal Architect Graphics Product Group AMD Canada T: 905-882-2600 905-882-2600 ext. 6700 F: (905)882-9339 Email: gamal.refai-ahmed@amd.com	Dr. Gamal Refai-Ahmed, ASME Fellow, obtained his M. A. SC. and Ph. D. from the University of Waterloo, Canada. He is specialized in the thermal management of electronic and optical packaging, where he developed innovative electronic packaging products in Nortel, Astec-Emerson, Cisco, Ceyba and ATI Technologies. Currently, he is the AMD Fellow and Chief Thermal Architect of the Graphics Products Group. He has over 55 technical papers and 20 patents/patents pending. He is also the vice chair of the electronic and photonic packaging division committee, EPPD, ASME as well as the vice chair of the electronic packaging committee, K-16, Heat transfer Divison, ASME.
Secretary	
Samuel Graham Assistant Professor College of Engineering School of Mechanical Engineering e-mail: sam.graham@me.gatech.edu Tel: 404-894-2264	Synthesis and Characteristics of Nanomaterials

Member Name and Address	
Amanie N. Abdelmessih, Ph.D. Professor Mechanical Engineering Department Saint Martin's University 5300 Pacific Avenue S.E. Lacey, WA 98503-1297 **Tel:** (360) 438-4532 **Fax:** (360) 438-4548 Email: *abdelmessih@stmartin.edu*	Convective (natural and forced) heat transfer, and absorption cycles cooling
Professor Dereje Agonafer DirectorElectronics, MEMS & Nanoelectronics Systems Packaging Center Mechanical and Aerospace Engineering Department 500 West First St, Rm 211A Woolf Hall University of Texas at Arlington Arlington, TX 76019 Phone: 817-272-7377 Fax: 817-272-5010 **Email:** agonafer@uta.edu	The research at the Electronics, MEMS, and Nanoelectronics Systems Packaging Center is multidisciplinary and focuses on a variety of topics related to thermo/mechanical issues in Microelectronics, MEMS and Nanoelectronics with broad applications including computers, telecommunications and bio-fluidics. The EMNSPC microsystems reliability is located at UTA's Automation & Robotics Research Institute (ARRI). The team uses the fabrication capability at UTA's NanoFab Research and Training Facility.
Cristina H. Amon, SC.D. Lane Distinguished Professor of Mechanical Engineering Director of ICES Institute for Complex Engineered Systems Carnegie Mellon University Pittsburgh, PA 15213-3890 **Tel:**(412) 268-3651/4343 **Fax:** (412) 268-3348/5229 **Email:** *camon@cmu.edu*	Thermal Management of Portable Electronics and Wearable Computers, Conjugate Heat Transfer, Nano-scale Thermal Transport, High-Performance Electronics Cooling Technologies, Concurrent Thermal Design, Phase Change Heat Transfer, Computational Fluid Dynamics & Heat Transfer including Transport in Methanol Fuel Cells, Hemodynamics and Mass Transport in Biological Systems.
Ann M. Anderson, PhD Associate Professor Department of Mechanical Engineering Union College Schenectady, NY 12308 **TEL:** (518) 388-6537 **FAX:** (518) 388-6789 **Email:** *andersoa@union.edu*	Forced and free convection air cooling of electronics with emphasis on temperature prediction methods. Experimental and numerical modeling studies of heat transfer in electronics.
Avram Bar-Cohen Chair and Professor of Mechanical Engineering 2181 Glenn L. Martin Hall University of Maryland College Park, MD 20742 **Phone**: 301-405-3173 **Fax**: 301-314-9477 **Email**: abc@umd.edu	

Mulugeta K Berhe, Ph.D Senior Thermal Engineer Intel Corporation 15400 NW Greenbrier Pkwy, MS CO5 – 166 Beaverton, OR 97006 Phone: 503-677-5208 Email: Mulugeta.k.berhe@intel.com	Computational Heat Transfer and Fluid Flow
Sushil H. Bhavnani Alumni Professor Department of Mechanical Engineering Auburn University Auburn, AL 36849 **TEL:** (334) 844-3303 **FAX:** (334) 844-3307 **Email:** *bhavnani@eng.auburn.edu*	Direct immersion cooling, enhancement of natural convection, fundamentals of heat transfer from structured surfaces, boiling from cavity-enhanced heat sinks, web-based electronics thermal management education
Victor A. Chiriac, Ph.D. Advanced Packaging and Systems Integration Freescale Semiconductor, Inc. 2100 E. Elliot Road, MD EL725 Phoenix, AZ 85284, USA email: victor.chiriac@freescale.com	Computational Fluid Dynamics, Conjugate Heat Transfer, Numerical Simulation and Experimental Characterization of Components; New Cooling Technologies involving Natural/Forced convection, Confined Jet Impingement Cooling
David Copeland, DrEng Sun Microsystems 4120 Network Circle Mailstop USCA12-306 Santa Clara CA 95054 tel 1 408 276 6528 fax 1 408 276 4616 Email: david.copeland@sun.com	Thermal management of servers Air, liquid, and refrigeration cooling Heatsink and coldplate optimization Temperature dependence of power
Tonapi Sandeep, Ph.D. Avneshak http://www.anveshak.com Tel: 1480-518-7393 E-Mail: sandeep.tonapi@anveshak.com	
Michael J. Ellsworth, Jr. P.E. Senior Technical Staff Member Advanced Thermal Laboratory IBM Corporation 522 South Rd. MS P520 Poughkeepsie, NY 12601 **Tel** : 845-433-5228 **Fax** : 845-432-9805 **Email:** *mje@us.ibm.com*	- Thermal management of notebook/personal computers, workstations, and large system servers + Air/liquid cooling, refrigeration, thermoelectrics, heat pipes, etc. + Cooling at the device, package/module, and system level - Thermo-mechanical aspects of electronic packaging - Numerical analysis: FEA, CFD

Timothy S. Fisher Associate Professor of Mechanical Engineering Purdue University School of Mechanical Engineering 585 Purdue Mall West Lafayette, IN 47907 Tel: 765-494-5627 Fax: 765-494-0539 **Email:** *tsfisher@purdue.edu*	Research interests: small-scale heat transfer and fluid dynamics, direct energy conversion, thermal phenomena in semiconductors, molecular electronics, electron field emission, synthesis of carbon nanotubes, inverse computational methods, and finite- and boundary-element methods.
Amy S. Fleischer, Ph.D. Associate Professor of Mechanical Engineering Director, NovaTherm Laboratory Dept. of Mechanical Engineering Villanova University Villanova, PA 19085 **TEL:** (610) 519-4996 **Email:** *amy.fleischer@villanova.edu*	Research interests: phase change materials, transient thermal management of electronics, nanomaterials, carbon nanotubes, carbon nanofibers, two phase flow, jet impingement cooling, experimental and numerical heat transfer
Suresh V. Garimella Professor and Director, Cooling Technologies Research Center, an NSF IUCRC School of Mechanical Engineering Purdue University 585 Purdue Mall, West Lafayette, IN 47907-2088 **TEL:** (765) 494 5621 **FAX:** (765) 494 0539 **Email:** *sureshg@ecn.purdue.edu*	High-performance cooling technologies Microelectronics packaging/cooling Microscale thermal phenomena Interface dynamics/tracking Electronic and composite materials processing
Dr. Samuel Graham Assistant Professor Woodruff School of Mechanical Engineering Georgia Institute of Technology 771 Ferst Dr. Atlanta, GA 30332-0405 **TEL:**404-894-2264 **FAX:**404-894-8496 **Email: sam.graham@me.gatech.edu**	thermophysical property measurements, thermal metrology, lattice dynamics modeling, heat dissipation in wide bandgap semiconductors and organic electronics
Brendon R. Holt Raytheon Missile Systems Tucson, AZ **TEL:**520-794-5957 **Email:**bholt@raytheon.com	

Dr. Masaru Ishizuka Associate Professor, Dr.-Eng. Dept. of Mechanical Systems Engineering, Toyama Prefectural University, 5180 Kurokawa,Kosugi, Toyama 939-0398, Japan Tel: 0766-56-7500 Ext 387, Fax:0766-56-6131 **Phone:** 0766-56-7500 Ext 387 **FAX:** 0766-56-6131 **Email:** *ishizuka@pu-toyama.ac.jp*	Application of thermal analysis to the design of electronic equipment and development of thermal analysis methods.
Yogendra Joshi Professor G.W. Woodruff School of Mechanical Engineering Georgia Institute of Technology Atlanta, GA 30332 **Phone:** 404-385-2810 **FAX:** 404-894-8496 Email:yogendra.joshi@me.gatech.edu	
Sung Jin Kim Professor School of Mechanical, Aerospace and Systems Engineering KAIST (Korea Advanced Institute of Science and Technology) Tel. +82-42-869-3043 Fax +82-42-869-8207 Mobile +82-11-437-3043	Convection in porous media Cooling Technology for Electronic packages Microscale Heat Transfer and Fluid Flow Optimum Design of Heat Exchanger, Heat Pipes and Heat Sinks
Seri Lee, Ph.D. Intel Corporation Silicon and Platform Solutions, CO1-152 15201 NW Greebrier Parkway Beaverton, OR 97006 Tel: (503) 677-4642 Fax: (503) 677-6138 **E-Mail**: *seri.lee@intel.com*	
Pradip Majumdar Professor and Director of Heat and Mass Transfer Laboratory Department of Mechanical Engineering Northern Illinois University DeKalb, IL 60115 Tel: 815-753-9963 Fax: 815-753-0416 Email: majumdar@ceet.niu.edu	Computational fluid Dynamics and heat transfer; Finite element analysis, Micro/Nano scale heat transfer in electronics; Free, forced and phase change heat transfer in electronics

Lemmy L. Meekisho, Ph.D. Associate Professor Mechanical Engineering Department Portland State University PO Box 751-ME Portland, OR 97207-0751 **Tel:** (503) 725-8149 **Fax:** (503) 725-8255 **Email:** *lemmy@me.pdx.edu*	Computational Thermal and Thermal-Mechanical Phenomena in Electronics and Electronic Packaging. Materials issues and thermal management in Electronic Packaging
Chuck Minning New Millennium Program Technologist/Avionics Jet Propulsion Laboratory California Institute of Technology 4800 Oak Grove Drive Mail Stop 303-300 Pasadena, CA 91109-8099 **Tel:** (818) 354-4148 **Fax:** (818) 393-5143 **Email:**charles.p.minning@jpl.nasa.gov	Thermal management of airborne and spaceborne electronics systems -Electrothermal interactions in semiconductors -Advanced electronics packaging for airborne and spaceborne electronics systems
Dr. Shirish Mulay Lexmark International, Inc. 740 New Circle Road # 035-3 Lexington, KY 40550-0001 **Tel:** (859) 232-7002 **Fax:** (859) 232-2177 **Email:** *mulay@lexmark.com*	Thermal management in printers Cooling at the device, package/module and system level Numerical analysis: FEA, CFD
Jayathi Murthy School of Mechanical Engineering Purdue University 585 Purdue Mall West Lafayette, IN 47907-2088 **Email:**jmurthy@purdue.edu Phone: 765-494-5701 FAX: 765-494-0539	Computational fluid dynamics and heat transfer • Finite volume methods and unstructured mesh techniques • Numerical methods for radiative transport • Reduced order modeling • Numerical methods for multiphase flows • Heat and mass transfer in micromanufacturing • Microscale heat transfer • Electronics cooling • Applications in aerospace, automotive, glass, and chemical-process industries
Mark North Mark T. North, Ph.D. Technical Advisor Thermacore, Inc. 780 Eden Rd. Lancaster, PA 17601 Tel: 717-519-3134 Fax: 717-569-4797 Email: m.t.north@thermacore.com	Heat pipes for high heat flux applications Improved structures for evaporative heat transfer Single phase heat transfer in porous media Optimization of heat pipes and heat pipe systems Experimental methods for two-phase heat transfer

Alfonso Ortega James R. Birle Chair Professor of Mechanical Engineering Dept. of Mechanical Engineering Villanova University Villanova, PA 19085 **Email:** *al.ortega@villanova.edu*	Research in Electronics Thermal Management focused on Experimental Methods, Advanced Air Cooled and Hybrid Air / Liquid Cooled systems, Air Cooling Limits, Conjugate Heat Transfer in electronics, Compact Thermal Models of electronic components such as packages and heat sinks, and Enhanced Cooling strategies such as Jet Impingement cooling.
James Petroski Research Associate Electronics Thermal Management GroupGrafTech International Holdings Inc. 12900 Snow Road Parma, OH 44130 (V) 216.676.2301 (F) 216.676.2137 www.graftech.comJim.Petroski@graftech.com	Thermal management and packaging of LED devices and systems
Donald Price, Ph.D., P.E. Industry Professor of Mechanical Engineering Department of Mechanical Engineering School of Engineering Southern Methodist University P.O. Box 750337 Dallas, TX 75275-0337 **Email:** dprice@engr.smu.edu	Dr. Price is involved with the thermal management of military and commercial electronic systems. In addition to fundamental work on the application of porous media to liquid-cooled cold plates for phased-array radars, he has been involved in the development of adaptive numerical solution techniques to enable the transient solution of finite difference thermal models of Monolithic Microwave Integrated Circuit (MMIC) devices and modules where the scale varies over six orders of magnitude, the measurement of the thin-film thermal properties of MMIC materials, and the simultaneous measurement of MMIC electrical performance characteristics and channel temperatures.
Koneru Ramakrishna, Ph. D. Interconnect Reliability, CMOS Platform Device Development Technology Solutions Organization Freescale Semiconductor, Inc. 3501 Ed Bluestein Boulevard, TX11/K10 Austin, TX 78721, USA email: k.ramakrishna@freescale.com Phone: (512)-933-2555 FAX: (512)-933-6438	Reliability of on-chip copper/low-k interconnects, thermal and thermo-mechanical simulation of chip backend processes, electronics cooling, thermal management of electronic packages, development of mechanistic methodologies to predict thermal characteristics of electronic packages, simulation of thermo-mechanical aspects of electronic package manufacturing processes, equipment, and reliability.
Gamal Refai-Ahmed, Ph.D. ATI Technologies, Inc. 1 Commerce Valley Drive East Markham, Ontario, Canada L3T 7X6 Tel.: (905)882-2600 X6700 Fax: (905)882-9339 E-mail: gahmed@ati.com	

Bahgat Sammakia Professor of Mechanical Engineering Director of the Integrated Electronics Engineering Center Watson School of Engineering State University of New York at Binghamton Binghamton, NY 12902 **Tel:** (607) 777-6880 **Fax**: (607) 777-4683 **Email:** bahgat@binghamton.edu	- Thermal management of Electronic packages - High performance thermal interface materials with enhanced with Nano-structures - Reliability of micro scale packages - Bio Packaging Microsystems
Roger Schmidt Distinguished Engineer Server Group IBM Corporation Mailstation P932 2455 South Road Poughkeepsie, N. Y. 12601 **TEL:** (845) 433-5259 **FAX:** (845) 432-9807 **Email:** *C28RRS@us.ibm.com*	Dr. Schmidt is involved in the thermal management of client/servers, mainframes, parallel processors and test equipment. Development of these systems have employed liquid cooling, air cooling, and refrigeration.
Jeffrey C. Suhling Quina Distinguished Professor, and Director NSF Center for Advanced Vehicle Electronics (CAVE) Department of Mechanical Engineering 201 Ross Hall Auburn University Auburn, AL 36849-5341 USA **TEL:** (334) 844-3332 **FAX:** (334) 844-3307 **Email:** jsuhling@eng.auburn.edu	· Thermo-mechanics and reliability of electronic packaging · Die stress and temperature measurements · Material characterization
Unni Vadakkan, Ph.D. Senior Mechanical Engineer Corporate Technology Group Intel Corporation 2111 NE 25th Avenue Mail stop: JF2-86 Hillsboro OR-97124 **TEL:** (503) 264-2721 **FAX:** (503) 264-6619 unnikrishnan.vadakkanmaruveedu@intel.com	Advancement in passive cooling technologies for micro electronic packages Application of Carbon Nano Tubes (CNTs) for thermal systems Numerical methods in heat and fluid flow
Greg Walker Assistant Professor Department of Mechanical Engineering Vanderbilt University VU Station B 351592 Nashville, TN 37235-1592 **Tel:** 615-343-6959 **Fax**: 615-343-6687 **Email:** *greg.walker@vanderbilt.edu*	

Dr. M.M. Yovanovich
Department of Mechanical Engineering
University of Waterloo
Waterloo, Ontario, Canada
N2L 3G1
TEL: 519-888-4567 ext.6181
FAX: (519) 888-6197
Email: mmyov@mhtlab.uwaterloo.ca