

## About the Speakers



### **Suresh Garimella , Ph.D. - KEYNOTE**

Professor Suresh Garimella is the R. Eugene and Susie E. Goodson Distinguished Professor of Mechanical Engineering at Purdue University where he is Director of the NSF Cooling Technologies Research Center. He received his Ph.D. from the University of California at Berkeley in 1989, his MS from The Ohio State University in 1986, and his Bachelor's degree from IIT Madras, in 1985. His research interests include energy efficiency in computing and electronics, renewable and sustainable energy systems, micro- and nano-scale engineering, and materials processing. Dr. Garimella has worked with over 70 Ph.D. and M.S. students and 32 visiting scholars and post-docs, and has co-authored over 450 refereed journal and conference publications and 13 patents/patent applications, besides editing or contributing to a number of books. Twelve alumni from his research group are now faculty members in prestigious universities around the world. Dr. Garimella is a Fellow of the Center for Smart Interfaces at the Technical University of Darmstadt, and an Honorary Guest Professor at Xi'an JiaoTong University in China, and was Honorary Visiting Fellow at the University of New South Wales in 1995.

Dr. Garimella serves in editorial roles with Applied Energy, ASME Thermal Science and Engineering Applications, International Journal of Micro and Nanoscale Transport, and Experimental Heat Transfer, and previously served with ASME Journal of Heat Transfer, Experimental Thermal and Fluid Science, and Heat Transfer-Recent Contents. He is a Fellow of the ASME. His efforts in research and engineering education have been recognized with the 2011 NSF Alexander Schwarzkopf Prize for Technological Innovation, the 2010 ASME Heat Transfer Memorial Award, the 2010 Distinguished Alumnus Award from IIT Madras, the 2009 ASME Allan Kraus Thermal Management Award, the 2009 Harvey Rosten Award for Excellence, the 2004 ASME Gustus L. Larson Memorial Award, the 2011 College of Engineering Mentoring Award, the 2009 Purdue University Distance Teaching Award, the 1995 Graduate School/UWM Foundation Research Award for Outstanding Research and Creative Activity, the 1997 UWM Distinguished Teaching Award, and the 1992 Society of Automotive Engineers' Ralph R. Teetor Educational Award, among others. He is currently serving as a Jefferson Science Fellow at the U.S. State Department, in the International Energy and Commodity Policy office of the Economic Bureau. This program offers his services as a science advisor to the State Department for a period of six years.



### **Victor Zaderej, M.S., MBA - KEYNOTE**

Victor Zaderej is the Manager of Advanced Development for Molex's Solid State Lighting Group where he provides strategic direction for the group as well as is responsible for the next generation of solid state lighting products. Victor joined Molex in 2000 when Molex purchased his and a business partner's company, Three Dimensional Interconnects Incorporated (3Di). The antenna business unit which was started as a result of the 3Di purchase now generates over \$110,000,000 in revenue for Molex. Victor began his work in the area of applying circuitry to three dimensional plastic components in 1987 while working for IBM's personal computer division where he was the lead engineer for the IBM PS/2 Model 50. He left IBM in 1989 for a joint venture between GE Plastics and Circuit Wise, specializing in the design and manufacture of MIDs (Molded Interconnect Devices). Working with both domestic and international customers to develop new applications as well as perfecting the technology to manufacture MIDs, Victor has been exposed to all aspects of using the technology to provide solutions to challenging electromechanical packaging applications.

Victor received his B.S. and M.S. in Mechanical Engineering from MIT. He completed his MBA in 1995 from Quinnipiac University. He holds 33 patents within the fields of electrical packaging, thermal management, energy conservation, and solid state lighting. He lives in St. Charles, Illinois. His interests include tennis, scuba, chess, and training architects, homeowners, and builders on the design of super energy efficient homes.

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### **Ihab Andre Ali, Ph.D.**

Andre is currently vice president of thermal products at Pipeline Micro, Inc., an advanced electronic cooling and micro fabrication startup. Andre is a founder of Rola Technologies, a technical, market and product strategy consulting company in electronics thermal design and energy efficiency markets. He is a former chief thermal architect at Apple where he is credited for leading and innovating thermal technologies and design architectures for Apple's Macbook, Macbook Pro, iMac, iPhone and other platforms. He is a former thermal technology engineer at Intel's mobile product group. His interests and research focus are in electronics thermal management and control, energy efficiency, renewable energy and environmental impact. Andre is an inventor of over 20 patents and applications and publisher of numerous papers in the field of thermal management and heat transfer. He also served as keynote speaker, panelist and chair at various conferences and forums worldwide. Andre has a B.S. in civil engineering from Damascus University, M.S. in mechanical engineering from WPI and Ph.D. in mechanical engineering from University of Maryland.



### **Mehdi Asheghi, Ph.D.**

Mehdi Asheghi is currently a consulting associate professor at the Stanford University focusing on further development of PCRAM technology. He completed his Ph.D. (1999) and postdoctoral (2000) at the Stanford university conducting research in the area of nanoscale thermal engineering of microelectronic devices. He is also with the iCONA Technology, which is a Palo Alto based research and development firm focusing on smart energy and thermal managements of residential buildings. He led a well-known and funded research program (2000-2006) at the Carnegie Mellon University that focused on nanoscale thermal phenomena in semiconductor and data storage devices. He is the author of more than 110 book chapters, journal publications and fully-reviewed conference papers.



### **Kaveh Azar, Ph.D.**

Dr. Kaveh Azar is the President and CEO of Advanced Thermal Solutions, Inc. (ATS), a leading edge thermal management company involved in developing liquid and air cooling solutions for the telecomm and computing market sectors. Under Dr. Azar's leadership, ATS has expanded globally with offices in Europe and Asia, and has become the leading supplier of cooling solutions and thermal management consulting to the telecomm market sector. Prior to ATS, Dr. Azar was the founder and manager of Lucent Technologies thermal management center, responsible for developing the next generation of cooling systems. In addition, Dr. Azar has authored Lucent's thermal roadmap and served as the corporate thermal consultant. While at Lucent, he developed a state-of-the-art thermal/fluids laboratory for simulation of components, boards and systems. Since 1985, Dr. Azar has been an active participant in electronics thermal community and has served as the organizer, general chair and the keynote speaker at the national and international conferences sponsored by ASME, IEEE and AIAA. He has also been an invitee to national bodies such as NSF, NIST and NEMI for organizing government and industry research goals in electronics cooling. Dr. Azar has been an adjunct professor at a number of universities in the USA, and lecturers worldwide

on different facets of electronics cooling. He holds more than 31 national and international patents, has published more than 73 articles, 3 book chapters and a book entitled, "Thermal Measurements in Electronics Cooling" and has edited a 5 book series, "Qpedia – Electronics Thermal Management." In addition, he served as the Editor-in-Chief of Electronics Cooling Magazine for eleven years, and is currently the publisher of Qpedia, a monthly publication dedicated to thermal management of electronic systems. Dr. Azar has received several recognitions within Bell Labs and other entities that include Bell Labs' President Silver Award, Strathmore's Who's Who, The Uptime Institute for Visionary Leadership and IEEE SEMITHERM Significant Contributor Award in thermal management of electronics systems.

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### **Norbert P. Engelberts**

Norbert P. Engelberts is the director of Advanced Thermal Solutions Europe and has been actively involved in electronics cooling since 1992. Prior to ATS, Engelberts headed the Thermal Design and Environmental Testing Group for Bell Labs, Lucent Technologies (now Alcatel-Lucent). During his 11 year tenure at Bell Labs, he was responsible for the thermal management and environmental testing (indoor and outdoor) of all telecommunications system equipment developed by the company in the Netherlands. In addition, Engelberts also brings with him expertise in HVAC system design, particularly those that house telecommunications and networking equipment. He works as a senior consultant for marked leading companies in the area of semiconductor, telecom, military, automotive and lighting. He has an extensive experience in the thermal management of LED based lighting solutions for a variety of applications, including automotive, street lighting, led replacement lamps.



### **Robert J. Moffat, Ph.D.**

Dr. Robert J. Moffat is a Professor at Stanford University and President of Moffat Thermosciences, Inc. Prof. Moffat started his professional career at the General Motors Research Laboratories on graduation from the University of Michigan (1952) in the Gas Turbine Laboratory. He assumed responsibility in 1958 for the testing of periodic-flow heat exchangers for regenerative gas turbines and the development of seals for these devices. He completed requirements for the degree of Master of Science, Engineering Mechanics, at Wayne State University in 1961, with a thesis on the behavior of ground effect machines (i.e., hover-craft) having thick curtain jets. He then enrolled in Stanford University in 1962 and completed the requirements for Master of Science (Mechanical Engineering), Engineer (Mechanical), and Ph.D. in Mechanical Engineering. He was appointed Acting Associate Professor, 1966, Associate Professor, 1967, and Professor of Mechanical Engineering, 1972, and served as the Director of the Thermosciences Industrial Affiliates Program from 1967 to 1986 and as Chairman of the Thermosciences Division from 1973 to 1986. His research efforts have involved three areas: convective heat transfer in engineering systems, experimental methods in heat transfer and fluid mechanics, and biomedical thermal issues. The largest body of work concerns convective heat transfer. The first program, begun in 1967 and continued until 2002, focused on gas turbine blade and vane heat transfer. The second program, begun in 1980 and continuing to the present, is aimed at convective cooling of electronic components. Early work focused on measuring heat transfer coefficients in a coherent sequence of experiments covering forced convection, free convection and mixed convection. From these data, a clear physical picture of the mechanisms was extracted. The behavior of finned heat sinks was studied analytically and experimentally, to explain the effect of the local pressure gradient on the heat sink behavior. In its broadest terms, the Stanford work was the first to capitalize on the linearity of the heat transfer process and use superposition to deal with heat transfer from arrays of objects that are non-uniformly heated. Several significant contributions came out of these programs: (1) a demonstration of the importance of developing invariant descriptors of heat transfer, (2) a new definition of the heat transfer coefficient for electronics cooling (the concept of h<sub>adiabatic</sub>) and (3) the development of a simple correlation for predicting h<sub>ad</sub> with useful accuracy based on an estimate of the turbulence intensity. The second area of research concerned experimental methods in the thermosciences. The pioneering work of S. J. Kline was extended and developed into a tool useful in planning experimental programs of provable accuracy. A good deal of work was done on the use of thermocouples for point-wise temperature measurements and full-field imaging techniques for temperature, heat flux, and heat transfer coefficient measurement using thermochromic liquid crystals and digital image handling. The experimental methods program contributed regularly to the theory of uncertainty analysis through presentations and publications. Professor Moffat was an invited lecturer for 40 consecutive years in the Measurement Engineering Series (originally through Arizona State University), for more than 20 years in the Instrument Society of America Test Measurements Division Professional Development Program and, for ten years, in the ASME Professional Development program. There was been a continuing, small scale effort on biomedical engineering problems, in particular the thermal protection of newborn infants. A self-contained, portable incubator was developed which provided a neutral thermal environment for the infant while allowing free access by the attending physicians. It has been used on almost every continent where cold-weather transport is needed and resulted in the award of the ASME Holley Medal Award, 1987. Moffat Thermosciences, Inc. was incorporated in 1984 as a vehicle for consulting, research, and teaching in Heat Transfer and Experimental Methods. The corporation has been active in preparing and delivering short courses in the area of Electronics Cooling, Experimental Methods, and Uncertainty Analysis, as well as problem solving. Dr. Moffat hold nine patents related to heat transfer, fluid mechanics, and instrumentation and has authored over 230 publications on heat transfer, experimental methods, biomedical issues and teaching.



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### **Alfonso Ortega, Ph.D.**

Alfonso Ortega is the James R. Birle Professor of Energy Technology at Villanova University and Associate Dean for Graduate Studies and Research for the College of Engineering. He received his B.S. in 1976 from The University of Texas-El Paso, and his M.S. and Ph.D. from Stanford University in 1978 and 1986 respectively, all in Mechanical Engineering. He was on the faculty of Aerospace and Mechanical engineering at The University of Arizona from 1988 to 2005 where he founded and directed the Experimental and Computational Heat Transfer Laboratory. From 2004 to 2006, Dr. Ortega was the Program Director for Thermal Transport and Thermal Processing in the Chemical and Transport Systems Division of The National Science Foundation in Arlington, Virginia. He joined the faculty of Mechanical Engineering at Villanova University in 2005. Dr. Ortega directs the Laboratory for Advanced Thermal and Fluid Systems conducting research in the heat transfer and fluid mechanics fundamentals of convective heat transfer in single and two phase flow, especially in problems that arise from the technology of electronics thermal management, gas turbine cooling, and alternative energy technologies. He has supervised nearly 40 M.S. and Ph.D. candidates to degree completion and is the author of over 300 journal and symposia papers. Dr. Ortega is a Fellow of the ASME and is currently Associate Editor of the ASME Journal of Heat Transfer.



### **Majid Safavi**

Majid Safavi, Distinguished Member of Technical Staff at Bell Laboratories and Alcatel Lucent Technical Academy member has over 25 years of experience in thermal/mechanical R&D of telecom equipments. He is the principle thermal designer for the land line and wireless switching products at the Naperville campus and has been involved in the successful design of more than 100 products currently in the field. Mr. Safavi represents Alcatel Lucent in the North American Telecom Standards bodies, Telcordia and ATIS, working on standards related to energy efficiency and thermal management of Telecom equipments and environments. In addition to thermal design he has also been working on, process improvement, seismic analysis and testing, project management, and system engineering.



### **Jim Wilson, Ph.D.**

Dr. Jim Wilson is currently an Engineering Fellow with Raytheon Space and Airborne Systems in Dallas, Texas and the section manager for the mechanical analysis section of Raytheon's Advanced Product Center. Jim has 26 years experience in electronics cooling of microwave systems and other military electronic products. He has spent a substantial portion of his career responsible for phased array radar thermal management with topics ranging from thermal design at the microwave integrated circuit level, directed research for advanced thermal interface materials, engineered material for enhanced thermal conduction, as well as overall cooling system design. The challenges of cooling radar systems have included a large portion of the electronics cooling heat transfer spectrum; conduction with advanced materials, liquid cooling, radiation cooling of satellite systems, and the challenges represented by the need to manage both maximum temperatures and the temperature distribution.

Dr. Wilson has been active in professional thermal management societies and is currently an associate editor of Electronics Cooling magazine. Jim is an active member of the steering committee for the annual IEEE Semitherm conference. He has six thermal design patents and has authored or co-authored over 25 papers in the field of

electronics thermal management including invited papers at government workshops sponsored by NASA and the Office of Naval Research. He received his BSME from Texas Tech, MSME from Stanford, and Ph.D. from Southern Methodist University. As part of his dissertation, he developed numerical techniques to rapidly simulate transient temperatures in GaAs MMICs.