ADVANCE PROGRAM AND REGISTRATION

IMAPS Advanced Technology Workshop on Thermal Management

SHERATON PALO ALTO HOTEL
PALO ALTO, CA 94301
OCTOBER 25 - 27, 2004

General Chair:
Dave Saums, DS&A
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Technical Program Chair:
David Copeland, Fujitsu Laboratories
P: 408-530-4693
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TECHNICAL PROGRAM & REGISTRATION ON-LINE:
WWW.IMAPS.ORG/ THERMAL

Sponsored by:
The International Microelectronics And Packaging Society (IMAPS)
“Everything in electronics between the chip and the system”

in conjunction with the System Packaging ATW • October 27-29*
*Visit www.imaps.org/systemspack for more information!

Early Registration and Hotel Deadline: September 24, 2004
Monday, October 25

Registration: 8 am - 9 pm
Continental Breakfast: 8 am - 9 am

SESSION 1: MARKET DRIVERS
9 am - 12:30 pm
Chair: Dave Saums, DS&A

Sustainability: A Key Market Driver of the Future Information Technology Industry
Chandrakant D. Patel, Hewlett Packard Laboratories

Bringing Together the Microelectronics / Packaging and Building Cooling Industries
Donald L. Beaty, DLB Associates, Consulting Engineers, P.C.; Roger Schmidt, IBM

64-bit Server Cooling Requirements
David Copeland, Fujitsu Laboratories of America

Break: 10:30 am - 11 am

Challenges and Development Areas for Thermal Management of Next Generation Microprocessors
Thomas P. Dolbear, Sridhar Sundaram, Advanced Micro Devices

Market Drivers and Applications for Engineered Thermal Materials
Dave Saums, DS&A

Thermal Management of Graphics Processors
Joe Walters, nVidia

Lunch: 12:30 pm - 1:30 pm

SESSION 2: REFRIGERATION AND LIQUID COOLING
1:30 pm - 5 pm
Chair: John Peeples, The Citadel

High Performance Heat Spreader for High Power Electronics
Jon Zuo, Chanwoo Park, David Sarraf, Advanced Cooling Technologies, Inc.

Thermal Performance of Fluorinated Fluids in Pool Boiling with Application to Thermosyphons
Philip E. Tuma, 3M

Miniature Loop Heat Pipes – A Promising Means for Cooling Electronics
Jay M. Otcherbeck, Yury F. Maydanik, Sergey V. Vershinin, Mikhail A. Korukov, Clemson University

Break: 3 pm - 3:30 pm

High Performance, Reliable Liquid Cooling Components and Systems for Computing and Electronics Devices Utilizing Standard Materials and Manufacturing Processes
William Ott, PAR Technologies

New Efficient Liquid Cooling Technologies for Computer Systems
Peter Prechtl, HTP Microsystems GmbH; Olaf Kurtz, Atotech Deutschland GmbH

Tuesday, October 26

Registration: 8 am - 9 pm
Continental Breakfast: 8 am - 9 am

SESSION 4: METALLIC INTERFACE MATERIALS
9 am - 12:30 pm
Chair: Herman Chu, Cisco Systems

Advancements in Heat Transfer Via Direct Soldering of Copper to Aluminum
Bryce Watson, Bill Avery, Kester

Enhanced Thermal Performance by Direct Solder Attach of Silicon Dies
Jai S. Subramanian, T. Rude, J. Newson, J. He, T. P. Weihs, RNT

Active Metal Brazing Copper to Ceramic Substrates Solving Thermal Challenges of Power Devices
Keith Easler, Kyocera America

Break: 10:30 am - 11 am

Development of Die Attach Solder with Improved Thermal
Mitch Holtzer, John Laughlin, Brian Lewis, Tony Ingham, Cookson Electronics

Thermal Properties of Active Solder Bonds
Randall Redd, Ronald W. Smith, S-Bond Technologies LLC

Reliability and Performance of a Low Melt Alloy-based Thermal Interface System
Chris G Macris, Thomas R. Sanderson, Robert R. Ebel, Christopher B. Leyerle, Enerdyne Solutions
Lunch: 12:30 pm - 1:30 pm

SESSION 5: NONMETALLIC INTERFACE MATERIALS
1:30 pm - 2:30 pm
Chair: Dave Saums, DS&A

Thermally Conductive Materials: How Material Properties Relate to Application Performance
Jim Bacorn, Sanjay Misra, Kasyap Seethamraju, The Bergquist Company

Carbon Black Thermal Pastes that Surpass Solder and Best Commercial Thermal Pastes in providing High Thermal Contact Conductance
Chia-Ken Leong, D. D. L. Chung, University at Buffalo, State University of New York

SESSION 6: FAN OPTIMIZATION
2:30 pm - 4 pm
Chair: Cullen Bash, Hewlett-Packard Laboratories

A Practical Engineering Approach to Extract Fan Curves Based on Skin-to-Skin Distance, Plenum Size and Fan Speed from a Single Fan Curve Data
M. Baris Dogruoz, Attila Aranyosi, Juan Cruz, William Maltz, Electronic Cooling Solutions Inc.; Andre Ali, Apple Computer

Break: 3 pm - 3:30 pm

Pushing Fan Performance to the Limit - Integration of Fan Electronics and Thermal Controller Electronics
Glenn Warren, Cisco Systems Inc.

SESSION 7A: HIGH CONDUCTIVITY, LOW EXPANSION MATERIALS
4 pm - 5 pm
Chair: David Copeland, Fujitsu Laboratories

Performance of High Conductivity Heat Spreaders in Flip Chip Thermal Packages
Martin W. Weiser, Nancy F. Dean, Honeywell Electronic Materials

Fabrication of CuSiC Metal Matrix Composites: Thermal Management Materials for the Next Generation Power Electronics
Pradeep Paul, Changmo Sung, Glenn Sundberg, Thomas Vasilos, University of Massachusetts at Lowell

Reception: 5:30 pm - 6 pm
Dinner: 6 pm - 7 pm

SESSION 7B: HIGH CONDUCTIVITY, LOW EXPANSION MATERIALS
7 pm - 9 pm
Chair: David Copeland, Fujitsu Laboratories

Ultrahigh-Thermal-Conductivity Packaging Materials
Carl Zweben, Independent Consultant

Thermal Performance of Experimental Hybrid Graphite Reinforced Al and Cu Matrix Composite Heat Sinks
James A. Cornie, Stephen S. Cornie, Shiyu Zhang, Eugene Chen, Larry Ballard, Metal Matrix Cast Composites, LLC

New Generation of Thermal Management Materials
Arndt Luedtke, Plansee AG; Frank Polese, Polese Company

Natural Graphite Based Materials for Electronics Cooling
Julian Norley, GrafTech

Wednesday, October 27

Registration: 7:30 am - 12:30 pm
Continental Breakfast: 7:30 am - 8:30 am

SESSION 8: TELECOMMUNICATIONS AND COMPUTING SYSTEMS
8:30 am - 10:30 am
Chair: William Maltz, Electronic Cooling Solutions

Thermal Characterization of the Advanced Graphics Card in a Real Operating Environment
Yean-Der Kuan, Kuang Wu Institute of Technology; Tsorng-Dih Yuan, Hsin-Yu Pan, Taiwan Semiconductor Company

Case Study of a Thermal Compromise on a Crowded PC Board
Marc Weideman, CoFan USA

An Open-System, Exergy-Based Analysis of Data Center Thermal Management Components
Amip Shah, Van Carey, University of California at Berkeley; Cullen Bash, Chandrakant Patel, Hewlett-Packard Laboratories

Scalable and Adaptive Cooling Solutions for Data Centers
Izuh Obinelo, Degree Controls Inc.

Break: 10:30 am - 11 am

SESSION 9: HEATSINK DESIGN AND MANUFACTURING
11 am - 12:30 pm
Chair: Cullen Bash, Hewlett-Packard Laboratories

Advances in High Watt Density (HWD) Thermoelectrics and Implications for CPU Cooling
Jim Bierschenk, Dwight Johnson, Marlow Industries

Thermal Modeling of the Press-on-Fin Heat Sink for IC Cooling
Guy R Wagner, RM Laboratories

Novel Manufacturing Process for Heatsinks using Powder Injection Molding Technology
Lye-King Tan, Advanced Materials Technologies

Lunch: 12:30 pm - 1:30 pm

IMAPS Advanced Technology Workshop on High-Speed Interconnect, EMC and Power Aspects of System Packaging for High Performance Computing, Telecom and Semiconductor Capital Equipment
Sheraton Palo Alto Hotel
Palo Alto, CA
October 27 - 29, 2004
Visit www.imaps.org/systemspack
**REGISTRATION FORM**

**REGISTER ON-LINE AT** [WWW.IMAPS.ORG/ THERMAL]

THERMAL MANAGEMENT ATW - OCTOBER 25 - 27, 2004

- Dr.  
- Mr.  
- Ms.

**First Name ________________________**  
**M.I. __________________**  
**Last Name ________________________**

**Company/Affiliation ______________________________**  
**Job Position ______________________________**

**Address __________________________________________**

**City __________________ State ______ Zip __________**

**Phone __________________ Fax __________________ Email __________________**

### REGISTRATION FEES: EARLY REGISTRATION ENDS 9/24/04

**Workshop Fees**

- Member (IMAPS)  
  On or before 9/24  $615  
  After 9/24  $715

- Non-member  
  On or before 9/24  $715  
  After 9/24  $815

*Includes one-year individual membership in IMAPS*

- Speaker/Chair  
  $350  
  $450

**Workshop Fees include an Abstract Book and a CD of Presentations. CD of Presentations will be mailed 10 business days after the event.**

### ADDITIONAL PURCHASES

- Spouse/Guest (meals only)  
  On or before 9/24  $150  
  After 9/24  $150

- CD of Presentations (Member Rate)  
  On or before 9/24  $100  
  After 9/24  $100

- CD of Presentations (Non-Member Rate)  
  On or before 9/24  $175  
  After 9/24  $175

- Add to Ship in the US  
  On or before 9/24  $7  
  After 9/24  $7

- Add to Ship Overseas  
  On or before 9/24  $25  
  After 9/24  $25

### PAYMENT

**Workshop Fee:** $___________________________

**Additional Purchases:** $___________________________

**Total Payment Due:** $___________________________

*A $25 fee must be added to all Wire Transfers.*

- Enclosed is a check payable in US funds to IMAPS
- Charge my fees to:
  - Visa
  - MasterCard
  - Discover
  - Amex
  - Diners Club

**Card#_________________________ Exp.__________**

**Signature_________________________**

**Card billing address, if different from above: (required)**

**Housing (Hotel Cut-off is September 24, 2004)**

Housing Accommodations must be made directly to:

**Sheraton Palo Alto Hotel**

625 El Camino Real  
Palo Alto, CA 94301  
P: 800-874-3516 or 650-328-2800  
E: SheratonReservation@pahotel.com

When making reservation, please reference IMAPS.

**Single/Double: $179**

Sheraton Palo Alto Hotel requires a deposit for the first night’s room and tax to hold your room. Deposit refunded if reservation is cancelled fourteen (14) days prior to arrival. After which time, deposit is non-refundable.

Register for both ATWs and Save!

**Thermal Management**

[www.imaps.org/thermal]

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