

ADVANCE PROGRAM AND REGISTRATION ON-LINE: WWW.IMAPS.ORG/THERMAL

IMAPS Advanced Technology Workshop
and Tabletop Exhibition on
Thermal Management

Dinah's Garden Hotel
Palo Alto, California - USA
OCTOBER 6 - 8, 2009

General Chair:

David Saums, DS&A LLC
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vadim.gektin@sun.com

Program Committee:

David Copeland, Sun Microsystems, Inc.
Vadim Gektin, Sun Microsystems, Inc.
William Maltz, Electronic Cooling Solutions
George A. Meyer IV, Celsia Technologies
John Peeples, The Citadel
Dave Saums, DS&A LLC
Guy R. Wagner, Storage Genetics, Inc.



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Hotel Cut-off: September 18, 2009
Early Registration Discount Ends: September 18, 2009

Tuesday, October 6

Registration: 7:30 am - 8:00 pm

Continental Breakfast: 7:30 am - 8:30 am

Opening Remarks: 8:25 am - 8:30 am

Exhibit Opens: Noon - 5:30 pm

SESSION 1: MARKET DRIVERS

Chair: [Dave Saums, DS&A LLC](#)
8:30 am - 11:30 am

Thermal Challenges and Requirements in Designing for Telco/Telcom Equipment in the NEBS Environment
[Herman Chu, Cisco Systems, Inc.](#)

Thermal Management Challenges for Hybrid Vehicle Powertrain Drives
[David Saums, DS&A LLC](#)

Advanced IGBT Module Packaging and Thermal Concepts for HEV Powertrains
[Andreas Schletz, M. März, E. Shimaneck, Fraunhofer IISB](#)

Break: 10:00 am - 10:30 am

Thermal Characterization of High Power LEDs - An Introduction to the Issues
[Bernie Siegal, Thermal Engineering Associates, Inc.](#)

Pool-Boiling Based Heat Sink Solutions
[Jesse Kim, S.M. You, Joo H. Kim, Vapro Inc.](#)

SESSION 2: THERMAL ANALYSIS I

Chair: [David Copeland, Sun Microsystems Inc.](#)
11:30 am - 3:00 pm

→Chronicles from the Frequency Domain: Benefits and Applications of AC Thermal Modeling, Simulation and Measurement
[Bjorn Vermeersch, Gilbert De Mey, Jędrzej Banaszczyk, Ali Shakouri, Kofi Makinwa, Ghent University](#)

Lunch: 12:00 pm - 1:30 pm

→Multi Objective Optimization of Force Fed Microchannel Heat Sinks
[Edvin Cetegen, Serguei Dessiatoun, Michael Ohadi, University of Maryland](#)

→Thermal Management Requirements of Photonic Nanohole Array Sensors
[Mehmet Sen, Gregory J. Kowalski, Dale Larson, Northeastern University](#)

Characterization of Single-Phase Heat Transfer and Hydraulic Performance in Non-Uniformly Heated Microgap Channels

[Ihab Andre Ali, Avram Bar-Cohen, University of Maryland;](#)
[Ceferino Sanchez, William Maltz, Electronic Cooling Solutions Inc.](#)

Break: 3:00 pm - 3:30 pm

SESSION 3: LIQUID COOLING

Chair: [John Peeples, The Citadel](#)
3:30 pm - 5:30 pm

→System Package Embedded Active Liquid Cooling using 3D-MID Technology (Molded Interconnect Devices)
[Thomas Leneke, Sören Hirsch, TEPROSA - Otto-von-Guericke-University Magdeburg](#)

Cooling for IGBTs in Small Channels Based on Velocity and Length Using Common Cooling Liquid
[Christopher A. Soule, Thermshield LLC](#)

Development of Heat Pipe Loop Technology for Electronics Cooling
[Xudong Tang, Jens Weyant, Scott Garner, Jon Zuo, Advanced Cooling Technologies, Inc.](#)

→Surface Roughness Effects on Boiling Heat Transfer
[Benjamin J. Jones, Suresh V. Garimella, Purdue University](#)

Dinner: 5:30 pm - 7:00 pm

SESSION 4: SYSTEM COOLING

Chair: [John Peeples, The Citadel](#)
7:00 pm - 8:30 pm

Low Profile Heat Pipe Heat Sink and Green Performance Characterization for Next Generation CPU Module Thermal Designs
[Marlin Vogel, G. Xu, D. Copeland, Sun Microsystems, Inc.; S. Kang, B. Whitney, Aavid Thermalloy; G. Meyer, Celsius; K. Kawabata, Furukawa; M. Connors, Thermacore](#)

Thin Film Thermoelectric Heat Pump Chip Cooler
[John Archibald, Northfield Engineering Company](#)

→Simulation of a Thermoelectric Adsorption Heat Pump for Harsh Environment Electronics Cooling
[Ashish Sinha, Yogendra K. Joshi, Georgia Institute of Technology](#)

A SPECIAL THANK YOU

TO ALL THE MEMBERS OF THE PROGRAM COMMITTEE,
THE CHAIRS, SPEAKERS AND STUDENT COMPETITION
PROVIDERS.

YOUR PARTICIPATION IS GREATLY APPRECIATED!

Wednesday, October 7

Registration: 7:30 am - 8:00 pm

Continental Breakfast: 7:30 am - 8:30 am

Exhibit Opens: 10:00 am - 3:00 pm

SESSION 5: DATA CENTER COOLING

Chair: [George A. Meyer IV, Celsia Technologies](#)

8:30 am - 12:00 pm

The Energy Efficiency Advantage of Water Cooling IT Equipment in the Data Center - **Part 1**
[Michael J. Ellsworth, Jr., IBM Corporation](#)

The Energy Efficiency Advantage of Water Cooling IT Equipment in the Data Center - **Part 2**
[Michael J. Ellsworth, Jr., IBM Corporation](#)

A Scalable Thermal Management Architecture for Energy Efficient Containerized Data Center Cooling
[Joe Marsala, Rob Hannemann, Thermal Form & Function Inc.](#)

Break: 10:00 am - 10:30 am

KRATOS: Automated Management of Data Center Cooling Capacity with Adaptive Vent Tiles
[Alan McReynolds, Zhikui Wang, Carlos Felix, Cullen Bash, Christopher Hoover, Monem Beitelmal, Rocky Shih, Hewlett Packard](#)

Cold Aisle Containment and Energy Efficiency of the Data Center
[Ali Heydari, Veerendra Mulay, Facebook Inc.](#)

A Cold Plate Cooling System for Servers and other Electronic Enclosures
[Phil Hughes, Robert Lipp, Clustered Systems Company, Inc.](#)

Lunch: 12:00 pm - 1:30 pm

SESSION 6: THERMAL ANALYSIS II

Chair: [David Copeland, Sun Microsystems, Inc.](#)

1:30 pm - 4:00 pm

Thermomechanical Optimization of a Novel High Density Interconnect (HDI) Substrate
[Brian R. Smith, Peter Kwok, Andrew Mueller, Livia Racz, Draper Laboratory](#)

→ Thermal Analysis of High Power LEDs at Dynamic Conditions
[Bohan Yan, Nguyen Tran, Frank G. Shi, University of California-Irvine](#)

Capturing PCB Artwork for Thermal Design
[John Wilson, Mentor Graphics Corporation](#)

Break: 3:00 pm - 3:30 pm

Operating ICs Hotter to Dissipate Power
[James J. Wang, Power Gold LLC](#)

SESSION 7: THERMAL INTERFACE MATERIALS

Chair: [Guy R. Wagner, Storage Genetics, Inc.](#)

4:00 pm - 8:00 pm

Lead-Free Sintered Adhesives for High-Brightness Light Emitting Diode (HB-LED) Thermal Management
[Matthew Wrosch, Arsenia Soriano, Creative Electron, Inc.](#)

→ Thermal Interface Material Performance of Commercial Particle-Filled Products with Carbon-Based Nanostructure Inclusions
[Michael Rosshirt, Christopher Cardenas, Patrick Wilhite, Drazen Fabris, Cary Y. Yang, Santa Clara University](#)

Thermally Conductive Liquid Materials for Electronics Packaging
[Sanjay Misra, John Timmerman, The Bergquist Company](#)

Dinner: 5:30 pm - 7:00 pm

Metallic Thermal Interface and Die Attach Materials for IGBT Power Semiconductor Modules
[Amanda Hartnett, Jordan Ross, Indium Corporation; David L. Saums, DS&A LLC; Wolfgang Bloching, Indium Corporation of Europe](#)

A Highly Thermally Conductive No Pump-Out Grease: Properties and Applications
[Sara N. Paisner, LORD Corporation](#)

SESSION 8: HIGH CONDUCTIVITY MATERIALS I

Chair: [William Maltz, Electronic Cooling Solutions](#)

8:00 pm - 8:30 pm

Comparison of Temperature Cycling Behavior of Power Substrates Based on Different Advanced Joining Technologies and Substrate Materials
[Alexander Roth, Marianna Ponomarenko, Matthias Knörr, Andreas Schletz, Fraunhofer IISB](#)

SESSION 8 CONTINUES THURSDAY.

→ Student Papers

Student Competition Funding

provided by



Thursday, October 8

Registration: 7:30 am – 12:00 pm

Continental Breakfast: 7:30 am - 8:30 am

SESSION 8: HIGH CONDUCTIVITY MATERIALS I (CONTINUES)

Chair: William Maltz, Electronic Cooling Solutions
8:30 am – 10:00 am

Natural Graphite Reinforced Aluminum: A Cost/
Performance Paradigm Changing Technology for High Heat
Flux Thermal Management

James A. Cornie, Rob Hay, Kevin Fennessy, Steve Cornie, Metal
Matrix Composites

Thermophysical Properties Measurements of High Thermal
Conductive Organic Hybrid Materials by Sinusoidal Heating
Thermoreflectance Technique

S. H. Firoz, T. Yagi, N. Taketoshi, T. Baba, AIST

Optimal Micro Heat Pipe Configuration for High
Performance Heat Spreaders

Seema Singh, Nicole Okamoto, San Jose State University

Break: 10:00 am – 10:30 am

SESSION 9: HIGH CONDUCTIVITY MATERIALS II

Chair: William Maltz, Electronic Cooling Solutions

10:30 am – 12:00 pm

Alkali Silicate Glass Based Hermetic Thermal Coatings
Ross Wilcoxon, Nathan Lower, Rockwell Collins, Inc.

→ Thermal Cycling Stability of High Thermal Conductive
Diamondmetal Matrix Composites

Michael Kitzmantel, Vienna University of Technology; Erich
Neubauer, Wolfgang Kapaun, Austrian Institute of Technology
GmbH; Paul Angerer, CEST-Kompetenzzentrum für
elektrochemische Oberflächentechnologie GmbH; Ivi Smid, Kristina
Cowan-Giger, Pennsylvania State University

Recent Advances in the Development and Application of
Higher Thermal Conductivity Graphite Heat Spreader
Materials

Julian Norley, GrafTech International Ltd.

Closing Remarks: 12:00 pm

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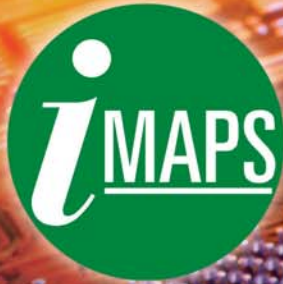
October 6-8, 2009; Palo Alto, California - USA

Program & Registration On-line: www.imaps.org/thermal

IMAPS Registration
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2009 ADVANCE PROGRAM

also available online at www.imaps2009.org

FEATURING:

- 2 Keynote Presentations:
 - ◆ **Dr. Bradley McCredie**, IBM Fellow and Vice President, IBM Systems & Technology Center
 - ◆ **Dr. Paul D. Franzon**, Distinguished Alumni Professor, North Carolina State University
- 15 Professional Development Courses
- Global Business Fall Marketing Forum
- 26 Technical Sessions
- Interactive Poster Session
- More than 200 Papers and Posters
- State-of-the-Art Exhibition and Technology Showcase

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REGISTRATION FORM

REGISTER ON-LINE AT WWW.IMAPS.ORG/THERMAL
IMAPS THERMAL MANAGEMENT ATW: OCTOBER 6 - 8, 2009

Dr. Mr. Ms. Member ID# _____
First Name _____ M.I. _____ Last Name _____
Company/Affiliation _____ Job Position _____
Address _____
City _____ State _____ Zip _____ Country _____
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REGISTRATION FEES: ADVANCE REGISTRATION ENDS 9/18/09

THERMAL WORKSHOP FEES (On or before 9/18) (After 9/18)

<input type="checkbox"/> Member (IMAPS)	\$650	\$750
<input type="checkbox"/> Non-member*	\$775	\$875
<input type="checkbox"/> Speaker* <input type="checkbox"/> Chair* <input type="checkbox"/> Chapter Officers*	\$425	\$525
<input type="checkbox"/> Student	\$225	\$325

Exhibits Only/Additional Booth Personnel - Complimentary Hall Pass (**meals not included, you must purchase a meal ticket**)

<input type="checkbox"/> Lunch Tickets (#of tickets____)	\$35/day	\$35/day
<input type="checkbox"/> All meals	\$100/day	\$100/day

*Includes one-year IMAPS individual membership or membership renewal at no additional charge. Does not apply to corporate or affiliate memberships. Access to all technical sessions, meals, refreshment breaks, an Abstract Book and one (1) CD-Rom of the presentations, CD will be mailed 15 business days after the event.

ADDITIONAL PURCHASES

<input type="checkbox"/> CD of Presentations (Member Rate)	\$200	\$200
<input type="checkbox"/> CD of Presentations (Non-Member Rate)	\$300	\$300
<input type="checkbox"/> Add to Ship in the US	\$7	\$7
<input type="checkbox"/> Add to Ship Overseas	\$25	\$25

HOW DID YOU HEAR ABOUT THIS EVENT?

- Direct Mail Website E-Mail
 Advancing Microelectronics Colleague
 IMAPS Weekly E-mail Bulletin Personal Phone Call
 Industry/Trade Magazine Other _____

HOUSING (Hotel Cut-off is September 18, 2009)

Housing Accommodations **must** be made directly to:

Dinah's Garden Hotel

www.dinahshotel.com

4261 El Camino Real

Palo Alto, CA 94306

P: +1-800-227-8220 or +1-650-493-2844

Please reference **IMAPS October Meeting** when making reservations by phone.

On-line: www.dinahshotel.com

Room Rate: \$120/night plus tax (Single/Double)

IMAPS cannot guarantee room availability or pricing after the September 18th deadline.

PAYMENT

THERMAL09PROG

Thermal Workshop Fee: \$ _____

Additional Purchases: \$ _____

Total Payment Due: \$ _____

Enclosed is a check payable in US funds to IMAPS

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Signature _____

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

Email address required to receive confirmation of registration.

Wire Transfers: IMAPS Headquarters will accommodate requests for payment to IMAPS by wire transfer. The party requesting to pay by wire transfer will be charged an additional fee of \$25 (U.S.) regardless of the amount of the transfer. Contact IMAPS HQ at 202-548-4001 or modonoghue@imaps.org for more information.

Mail this form with payment to: IMAPS * 611 2nd Street, NE * Washington, DC 20002-4909. For credit card transactions, register online: www.imaps.org; or register by phone with your credit card by calling 202-548-4001; Fax: 202-548-6115. Additional information? E-mail: IMAPS@imaps.org, or visit our web site: <http://www.imaps.org>. Cancellations will be refunded (less a \$50 processing fee) only if written notice is postmarked on or before **Friday, September 25, 2009**. No refunds will be issued after that date.