

IMAPS Advanced Technology Workshop on **Packaging & Assembly of Power LEDs**

**DINAH'S GARDEN HOTEL
PALO ALTO, CA 94306
OCTOBER 25 - 28, 2005**

General Co-Chairs:

Frank Wall, Lumileds Lighting LLC

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Program Committee:

Oscar Chao, Philips

Doug Hopkins, University of Buffalo

Barbara Landini, FlipChip International

Anwar Mohammed, Cree



Sponsored by:

The International Microelectronics And Packaging Society (IMAPS)

"Everything in electronics between the chip and the system"

in conjunction with the **Thermal Management ATW • October 23-26***

*Visit www.imaps.org/thermal for more information!

Early-Bird Registration Ends: October 10, 2005

Hotel Cut-off: October 10, 2005

TUESDAY, OCTOBER 25

Registration: 5:00 pm – 7:00 pm

Opening Reception: 6:00 pm – 6:30 pm

WEDNESDAY, OCTOBER 26

Registration: 7:30 am – 6:30 pm

Lunch: 12:15 pm – 1:15 pm

OPENING REMARKS: 1:45 PM – 2:00 PM

Frank Wall, General Co-Chair

SESSION 1: MARKET DRIVERS AND OVERVIEW

2:00 pm – 5:00 pm

Chair: Frank Wall, Lumileds Lighting LLC

Future Trends in Solid State Lighting
Steve Paolini, Lumileds Lighting LLC

Defining, Designing and Executing LED Systems for General Illumination
Ron Steen, Philips

Bringing it All Together – The Basics of Building an LED Module/ Assembly
Frank Wall, Lumileds Lighting LLC

Break: 3:30 pm – 4:00 pm

Thermal Management of an LED Light Engine for Airborne Applications
Ross Wilcoxon, David Cornelius, Rockwell Collins, Inc.

Practical Considerations in High Power LED Junction Temperature Measurements
Bernie Siegal, Thermal Engineering Associates

Reception: 5:00 pm – 5:30 pm

Dinner: 5:30 pm – 7:00 pm

DON'T MISS THE....
IMAPS Advance Technology Workshop on
THERMAL MANAGEMENT
Dinah's Garden Hotel
Palo Alto, CA
OCTOBER 23 - 26, 2005
www.imaps.org/thermal

THURSDAY, OCTOBER 27

Registration: 7:00 am – 5:00 pm

Continental Breakfast: 7:30 am – 8:30 am

SESSION 2: SUBSTRATES AND HEAT SPREADING MATERIALS I

8:30 am – 10:00 am

Chair: Barbara Landini, FlipChip International

Composite Baseplates and Components for High Power LED Applications
Dave Saums, DS&A, LLC

Benefits of Insulated Metal Substrates for High Power LED Applications
Justin Kolbe, Bergquist Company

A High Thermal Efficiency Substrate Solution for LEDs
Thomas M. Morris, T.T. Electronics - IRC Advanced Film Division

Break: 10:00 am – 10:30 am

SESSION 3: NOVEL PACKAGING CONCEPTS

10:30 am – 12:00 pm

Chair: Anwar Mohammed, Cree Inc.

Development of a Chip-on-Board LED Package Module for High Power Applications
Kyu-Ho Shin, Suho Shin, Soon Cheol Kweon, Jin Seung Choi, Seung Tae Choi, Kihwan Kwon, Arthur Darbinian, Chang Youl Moon, Samsung Advanced Institute of Technology

Self-Convectional High Power LED
Horng Ji-Bin, Cao Hong-Xi, Yang Chun Chieh, Chen Cheng-Fa, Chen Chih-Li, Industrial Technology Research Institute

New Electronic Package Incorporating Eutectic Attached Devices in a Moisture Resistant Air Cavity Plastic Package
David L. DeWire, John W. Roman, RJR Polymers Inc.

Lunch: 12:00 pm – 1:30 pm

SESSION 4: ADHESIVES AND SOLDERS

1:30 pm – 3:00 pm

Chair: Doug Hopkins, University of Buffalo and DCHopkins & Associates

Selecting Adhesives for LED Attach
Rich Wells, Engineered Materials Systems Inc.

Thermal Interfacing in LED Applications - Solder Based Solutions
Karthik Vijayamadhavan, Ross Berntson, Indium Corporation of America

New Bonding Materials Providing Improved Thermal Conductance

Alan Grieve, Arsenia Soriano, Howard Lenos, M. Albert Capote, Aguila Technologies, Inc.

Break: 3:00 pm – 3:30 pm

SESSION 5: ENCAPSULANTS

3:30 pm – 5:00 pm

Chair: Oscar Chao, Philips Lighting

A Characterization of Yellowing Caused by UV Radiation on Silicone Encapsulants, and Improvements in Future Materials
Bill Riegler, Randall Elgin, Rob Thomaier, NuSil Technology LLC

Silicone Materials Development for LED Packaging
Ann Norris, Maneesh Bahadur; M. Yoshitake, Dow Corning Corporation

Jetting - A New Paradigm in Dispensing
Robert Hoffman, Greg Wood, Horatio Quinones, Asymtek

Reception: 5:00 pm – 5:30 pm

Dinner: 5:30 pm – 7:00 pm

FRIDAY, OCTOBER 28

Registration: 7:00 am – 11:30 am

Continental Breakfast: 7:30 am – 8:30 am

SESSION 6: THERMOELECTRIC CONCEPTS FOR HIGH HEAT FLUX SPREADING

8:30 am – 10:00 am

Chair: Frank Wall, Lumileds Lighting LLC

Micropelt: Silicon Platform Technology for Thermoelectric Devices
Karl-Heinz Schlereth, Infineon Technologies AG

Solid-State Cooling for Optoelectronics Thermal Management
Zhixi Bian, Kazuhiko Fukutani, Rajeev Singh, Yan Zhang, Xi Wang, Ali Shakouri, University of California -Santa Cruz

Break: 9:30 am – 10:00 am

SESSION 7: SUBSTRATES AND HEAT SPREADING MATERIALS II

10:00 am – 12:00 pm

Chair: Dave Saums, DS&A LLC

Manufacture of High Thermal Conductivity (+700W/mK) Al-Graphite Composites with Reaction Bonded Carbide Formation to Improve Wetting
Glenn Sundberg, Sravanthi Mallim, University of Massachusetts - Lowell

GaAs LED Thermal Management by Wafer Level Bonding to Si by Microwave Selective Heating Technology

Nasser Budraa, Boon Ng, Microwave Bonding Instruments

Direct Copper Bonded Ceramic Substrates for use with Power LEDs

Alexander Roth, Jürgen Schulz-Harder, Ingo Baumeister, Curamik Electronics GmbH

WORKSHOP CLOSING REMARKS: 11:30 AM

Frank Wall, General Co-Chair

TRANSIT INFORMATION

Dinah's Garden Hotel is locally owned and operated and is a very unique hotel property. The rooms are rather unique and the hotel management has offered a great hotel room price for the IMAPS events during the week of October 23-28. For those attending either of the two IMAPS Advanced Technology Workshops who require a hotel room, Dinah's Garden Hotel will offer a rather unusual and pleasant change from the usual business hotel. There is a Trader Vic's Restaurant on the property, as well as a pool and shaded walkways and outdoor terraces.

Dinah's can be reached by car or by public transportation. If driving from San Francisco International Airport (airport code SFO) take US 101 (Bayshore Freeway) south to the San Antonio Road West Exit, follow the ramp to the right off of US 101 onto San Antonio Road and follow San Antonio Road west to the intersection of San Antonio Road with El Camino Real. At this intersection, there is a traffic light and the San Antonia Shopping Center is on the left hand side. Turn right (north) onto El Camino Real, which is also California Highway 82; it is all a 30MPH area for speed limits with many intersections.

If you are arriving at San Jose Airport (SJC), take US 101 (Bayshore Freeway) north to San Antonio Road Exit. Note that there is currently only one exit and there is heavy highway construction in the area. There is no exit that will take you directly west on San Antonio Road, so you must exit onto San Antonio Road and go one block east to a point where you can safely turn left and reverse direction, to go west on San Antonio Road. Follow San Antonio Road west to the intersection of San Antonio Road with El Camino Real. This is a distance of approximately 1.8 miles (2800m) to the El Camino Real intersection. Turn right and proceed not more than one-half mile or approximately 800m to Dinah's Garden Hotel, on the right hand side.

There is public bus service from San Jose Airport (SJC), offered by Santa Clara Valley Transit (Website: www.vta.org), to the San Antonio Transit Center on San Antonio Road, where you can take a taxi to the hotel. This is VTA bus route 22, from San Jose Airport (about 45 minutes, \$1.75 per trip); ask the route bus driver if there will be a stop at Dinah's Garden Hotel, which would be simpler. There is also private shuttle van service available at San Jose Airport, such as SuperShuttle. The cost of a shuttle van may be approximately \$25-30 per trip. Taxis from San Jose airport will charge a one-way fare of approximately \$60. Other services include Caltrain, the heavy rail commuter service; from SJC, a VTA bus is required to the Santa Clara Transit Center, then Caltrain to either San Antonio station or to California Avenue station (downtown Palo Alto), and a taxi from either station to the hotel.

The hotel website is: www.dinahshotel.com. The hotel direct telephone from overseas or within the U.S. is: +1 650 493 2844. The address is: Dinah's Garden Hotel, 4261 El Camino Real, Palo Alto CA 94306 USA.

REGISTRATION FORM

REGISTER ON-LINE AT WWW.IMAPS.ORG/LEDS

PACKAGING & ASSEMBLY OF POWER LEDs ATW: OCTOBER 25 - 28, 2005

Dr. Mr. Ms.

Member ID# _____

First Name _____ M.I. _____ Last Name _____

Company/Affiliation _____ Job Position _____

Address _____

City _____ State _____ Zip _____ Country _____

Phone _____ Fax _____ Email _____

REGISTRATION FEES: EARLY-BIRD REGISTRATION ENDS 10/10/05

LEDs WORKSHOP FEES

(On or before 10/10) (After 10/10)

- | | | |
|---|-------|-------|
| <input type="checkbox"/> Member (IMAPS) | \$615 | \$715 |
| <input type="checkbox"/> Non-member* | \$715 | \$815 |
| *Includes one-year individual membership in IMAPS | | |
| <input type="checkbox"/> Speaker/Chair/Student | \$350 | \$450 |

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

LEDs & THERMAL (REGISTER FOR BOTH ATWs AND SAVE)

- | | | |
|---|--------|--------|
| <input type="checkbox"/> Member (IMAPS) | \$1180 | \$1380 |
| <input type="checkbox"/> Non-member* | \$1380 | \$1580 |
| *Includes one-year individual membership in IMAPS | | |
| <input type="checkbox"/> Speaker/Chair/Student | \$650 | \$850 |

ADDITIONAL PURCHASES

- | | | |
|--|-------|-------|
| <input type="checkbox"/> Spouse/Guest (meals only) | \$160 | \$160 |
| <input type="checkbox"/> CD of Presentations (Member Rate) | \$150 | \$150 |
| <input type="checkbox"/> CD of Presentations (Non-Member Rate) | \$275 | \$275 |
| <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?

- | | | |
|---|--|---------------------------------|
| <input type="checkbox"/> Direct Mail | <input type="checkbox"/> Website | <input type="checkbox"/> E-Mail |
| <input type="checkbox"/> Advancing Microelectronics | <input type="checkbox"/> Colleague | |
| <input type="checkbox"/> IMAPS Weekly E-mail Bulletin | <input type="checkbox"/> Personal Phone Call | |
| <input type="checkbox"/> Industry/Trade Magazine | <input type="checkbox"/> Other _____ | |

HOUSING (Hotel Cut-off is October 10, 2005)

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

Dinah's Garden Hotel
4261 El Camino Real
Palo Alto, CA 94306
P: 650-493-2844 or 800-227-8220

Room Rate: \$125

Please reference IMAPS when making reservations.

Dinah's Garden 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.

Two Workshops - One Location
Register for both ATWs and Save!

LEDs (Light Emitting Diodes): October 25-28, 2005
www.imaps.org/leds

Thermal Management: October 23-26, 2005
www.imaps.org/thermal

PAYMENT

LEDATW05PROG

LEDs Workshop Fees: \$ _____

LEDs & Thermal: \$ _____

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)

Mail this form with payment to: IMAPS * 611 2nd Street, NE * Washington, DC 20002-4909. For credit card transactions, register on-line: 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, October 14, 2005**. No refunds will be issued after that date.

IMAPS Registration
611 2nd Street, NE
Washington, DC 20002-4909

"Address Service Requested"

Presorted
First-Class Mail
U.S. Postage
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Merrifield, VA
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