

IMAPS/IEEE-CPMT Advanced Technology Workshop on **Optoelectronic Packaging**

June 29 - 30, 2011

The California Institute for Telecommunications and Information Technology
(Calit2)

Conference Room# 3008 (3rd floor)

University of California - Irvine

Irvine, California

Final Program

General Chair:

John Mazurowski

Senior Research Engineer

Penn State Electro-Optics Center

jmazurowski@eoc.psu.edu

Technical Chair:

Mark Bachman

Electrical Engineering and Computer Science

University of California - Irvine

mbachman@uci.edu

Organizing Committee:

Dr. Benson Chan, Endicott Interconnect Technologies, Inc.

Mr. Jack Cunningham, Oracle Labs

Dr. Boris Kolodin, GE Lighting Solutions

Dr. Chin Lee, University of California - Irvine

Dr. Kannan Raj, Oracle Labs

Mr. Alex Rosiewicz, EM4 Inc.



IEEE COMPONENTS, PACKAGING AND
MANUFACTURING TECHNOLOGY SOCIETY

Workshop Focus

This workshop is a joint effort by the International Microelectronics and Packaging Society (IMAPS) and the Institute for Electrical and Electronics Engineers - Components, Packaging and Manufacturing Technology Society (IEEE-CPMT). The focus of the workshop is on optoelectronic packaging. We are moving to an age where:

- Photons will supersede electrons as the preferred carrier of information.
- Typical optical waveguides transmit many times more data than electrical wires.
- Optoelectronic devices (LEDs and solar cells) play a great role in new energy generation and energy saving.

Accompanying this change are global efforts in energy efficiency. Issues in the packaging of any device which translates optical energy to or from electrical / thermal / mechanical energy are the focus of the present workshop.

Wednesday, June 29th

Registration: 1:00 pm - 8:00 pm

Opening Remarks: 1:50 pm - 2:00 pm

Chairs:

John Mazurowski, Penn State Electro-Optics Center; Mark Bachman, University of California - Irvine

ITRS ASSEMBLY AND PACKAGING ROADMAP WORKSHOP

Chair: Bill Bottoms, Third Millennium Test Solutions - ITRS Assembly and Packaging ITWG

Vice Chair: Bill Chen, Aseus - ITRS Assembly and Packaging ITWG

2:00 pm - 5:00 pm

The International Technology Roadmap for Semiconductors, known throughout the world as the ITRS, is the fifteen-year assessment of the semiconductor industry's future technology requirements with a twenty-five year assessment of the longer range issues for emerging devices and materials. These future needs drive present-day strategies for world-wide research and development among manufacturers' research facilities, universities, and national labs.

ITRS personnel will hold an assembly and packaging roadmap working session for participants of this workshop:

- Presentation on the ITRS working process.
- Interactive discussion about optoelectronic packaging activities.

**A WebEx conference meeting will be available for participants who cannot be there in person.
The log in information will be circulated before the meeting.**

Reception: 6:00 pm - 8:00 pm

Thursday, June 30th

Registration: 7:00 am - 5:30 pm

Continental Breakfast: 7:00 am - 8:00 am

SESSION 1: MATERIALS AND PROCESSES

Session Chair: Dr. Chin Lee, University of California - Irvine

8:00 am - 10:20 am

This session illuminates the use of specific materials, manufacturing processes, and some unique devices.

Manufacturing Copper/Silver Composite Substrates for High Power Laser Diode Packaging
Chu-Hsuan Sha, Wen P. Lin, Yuan-Yun Wu, Shou-Jen Hsu, Chin C. Lee, University of California, Irvine

Vacuum Solder Reflow Achieving Void Free and a Flux Free Attachment of Concentrated Photovoltaic (CPV) Solar Cells
Paul W. Barnes, Pierino Zappella, SST International

Paperless Laboratory: Increased Efficiency and Traceability in Microelectronics Assembly
Julie Adams, Daniel Evans, Jr., Jim O'Brian, Palomar Technologies, Inc.

Break: 9:15 am - 9:30 am

Laser Seam Sealing of Optoelectronic Packages
Geoff Shannon, Miyachi Unitek Corporation

Reactions in Ag-In System for Bonding Optoelectronic Devices at 180°C
Wen P. Lin, Chu-Hsuan Sha, Shou-Jen Hsu, Yuan-Yun Wu, Chin C. Lee, University of California, Irvine

SESSION 2: LED PACKAGING

Session Chair: TBD
10:20 am - 11:35 am

This area focuses specifically on light emitting diodes- design, processing, efficiency.

Self-Aligned Miniature External Cavity Tunable Single Frequency Laser from Blue-Violet to Infrared
Frank Havermeyer, Lawrence Ho, Ondax Inc.; Christophe Moser, Swiss Federal Institute of Technology Lausanne

Quality Dispensing for Tight CIE and Narrow Side-View LED
Akira Morita, Nordson Asymtek

Thermal Characterization of White Light-Emitting Diodes
Bohan Yan, Nguyen T. Tran, Jiun-Pyng You, Frank G. Shi, University of California, Irvine

Lunch: 11:35 am - 12:35 pm

SESSION 3: PHOTONIC PACKAGING

Session Chair: John Mazurowski, Penn State Electro-Optics Center
12:40 pm - 3:25 pm

This session highlights aspects of photonics - devices, interconnections.

Layer-to-Layer Alignment and Bridge Powering in a Silicon Photonic Macrochip Package
Hiren D. Thacker, Ivan Shubin, Ying Luo, Xuezhe Zheng, Guoliang Li, Jin Yao, Jon Lexau, Kannan Raj, Ron Ho, Ashok V. Krishnamoorthy, John E. Cunningham, Oracle Labs

Thermal Tuning Efficiency Optimization of the Waveguide Ring Filters in SOI CMOS
Ivan Shubin, Xuezhe Zheng, Gouliang Li, Hiren Thacker, Bruce Guenin, Ashok V. Krishnamoorthy, John E. Cunningham, Oracle Labs

Break: 1:30 pm - 1:45 pm

Design and Wafer-Level Fabrication of Positive Self-Alignment Structures for Improved Vertical Optical Coupling
Hyung Suk Yang, Muhannad S. Bakir, Georgia Institute of Technology

Miniaturized Fiber Optic Transmitter, Receiver, and Transceiver with High Quality for Special Military and Commercial Applications
Golden Shu, Mark P. Bozeman, Ron S. Hays, Aaron D. Kua, Teledyne Microelectronic Technology (TMT)

MEMS Optical Acoustic Sensors in Laminates
Jonas Tsai, Yang Zhang, Mark Bachman, G. P. Li, University of California, Irvine

Photonic Sensing and Laser-based Devices Enabled by OspreyCE Alloys
Andrew Ogilvy, Stu Weinshanker, Sandvik Osprey

INNOVATION HOUR

Moderator: Mark Bachman, University of California - Irvine
3:25 pm - 4:25 pm

Businesses and individuals can sign up for impromptu (5 minute) talks about their business, technical area, or topic interest.

STUDENT POSTERS / CLOSING RECEPTION

Session Chair/Moderator: Mark Bachman, University of California - Irvine
4:25 pm - 5:25 pm

Networking between students and attendees.