Advance Program and Registration On-Line at www.imaps.org/midatlantic

IMAPS Mid-Atlantic Chapters Present the

Mid-Atlantic Microelectronics Conference

Atlantic City Hilton
Atlantic City, New Jersey - USA

June 17 - 18, 2010

General Chair:

Voya Markovich, Endicott Interconnect Technologies
voya.markovich@eitny.com

Technical Chairs:

Ray Fillion
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Benson Chan, Endicott Interconnect Technologies
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Vendor Chair:

Leo Garvey, LFG Micro
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Marketing Chairs:

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Steve Lehnert, Loral Space Systems
stevel43@optonline.net

Mid-Atlantic Chapter Chairs:

Steve Lehnert (Metro), Erica Folk (Chesapeake), Mike Salloum (Garden State), Benson Chan (Empire), Jim Wood (Keystone) and John Mazurowski (Cleveland Pittsburgh)

Organized by: The International Microelectronics And Packaging Society (IMAPS)
Bringing Together the Entire Microelectronics Supply Chain!

Early Registration, Exhibit Reservation and Hotel Deadlines: May 26, 2010

Thursday, June 17, 2010

Registration: 12:00 pm - 5:00 pm

Reception: 5:30 pm - 7:00 pm (Exhibit Hall)

Professional Development Courses (PDC): 1:00 pm - 5:00 pm

PDC1: Wire Bonding

Instructor: Lee Levine, Consultant, Process Solutions Consulting

In 2008 more than 10^{13} semiconductor interconnects were produced. Of this quantity, more than 90% were wire bonds. Wire bonding is a high speed, ultrasonic welding process. In the most commonly used process, ball bonding, fine diameter (average diameter is now < 25mm) gold or copper wire is welded to a thin (1mm) Al-1%Si-0.5%Cu bond pad on the semiconductor device. Typical bond pads are now less than 75mm square and devices like graphic processors may have more than 1000 on a single device. State-of-the-art bonders now operate at rates > 16 wires/second (32 welds with high speed motions between the two welds that define the ends of each wire). Placement accuracy must be better than ±2.5mm. It is not unusual for factories with well characterized and controlled materials and manufacturing to experience bond defect rates less than 10 ppm.

This half day workshop will cover:

- The Ball Bond Process: Step by Step Wire Bonding
- Welding
- The effect of ultrasonics on weld formation and materials properties
- Metallurgy and Intermetallics
- A comparison of the welds associated with Au-Al and Al-Cu bonding
- The effect of wire alloying on ultra-fine pitch reliability
- Wire properties, testing and chemistry
- Pull and shear testing wire bonds
- Understanding wire stiffness and the effect on looping
- Capillary design and selection for optimized processes
- Simple bond screening designed experiments
- How to optimize the bonding process

Mr. Lee Levine *is a consultant for Process Solutions Consulting where he provides process engineering consultation and SEM/EDS analysis. Lee's previous experience includes 20 years as Principal and Staff Metallurgical Process Engineer at Kulicke & Soffa and Distinguished Member of the Technical Staff at Agere Systems. He has been awarded 4 patents, published more than 50 technical papers, and in 1999 won the John A. Wagnon Technical Achievement Award from the International Microelectronics And Packaging Society (IMAPS). Major innovations include copper ball bonding, loop shapes for thin, small outline packages (TSOP and TSSOP, and CSPs) and introduction of DOE and statistical techniques for understanding semiconductor assembly processes. He is an IMAPS Fellow, V.P. of the Keystone Chapter, and V.P. Technology for IMAPS. In addition he is a senior member of IEEE.*

Lee is a graduate of Lehigh University, Bethlehem, Pa where he earned a degree in Metallurgy and Materials Engineering.

PDC2: Near Hermetic Packaging Concepts for Military and Medical Devices

Instructor: Tom Green, Consultant, TJ Green Associates, LLC

TJ Green Associates LLC is a Veteran owned small business (www.tjgreenllc.com)

This PDC is intended as an intermediate level course for process engineers, designers, quality engineers, and managers responsible for sealing, leak testing and RGA results and for those responsible for evaluating new polymeric cavity style packages.

Packages made from polymeric materials (e.g., LCP) as opposed to traditional hermetic seals (i.e., metals, glasses, ceramic, etc.) require a different approach from a hermeticity design and testing standpoint. The problem is now one of moisture diffusion through the bulk and package interfaces, which is different than water vapor permeating a crack in a glass to metal seal. A brief review of the techniques and methods to evaluate a "near-hermetic" approach is presented along with a discussion of the pitfalls and issues of TM 1014 (Seal) and TM 1018 (Internal Water Vapor) as applied to a "near hermetic package" along with the fundamental theory including: Fick's law of moisture diffusion, WVTR, TGA and moisture diffusion coefficients. Applications of moisture sensing inside a package and a discussion on how to qualify a "near hermetic" package will be presented.

Mr. Thomas Green *is an independent consultant and respected teacher. He has over twenty-seven years of experience in the microelectronics industry and has worked at Lockheed Martin Astro Space and USAF Rome Laboratories. At Lockheed he was a staff engineer responsible for the materials and manufacturing processes used in building custom high reliability space qualified microcircuits (Hybrids, MCMs and RF modules) for military and commercial communication satellites. Tom has demonstrated expertise in seam sealing and leak testing processes. He has conducted experiments and presented technical papers at NIST (National Institute of Standards and Technology) and IMAPS (International Microelectronics And Packaging Society) on leak testing techniques and optimization of seam welding processes through statistical DOE methods. At USAF Rome Labs he worked as a senior reliability engineer and analyzed component failures from AF avionic equipment along with providing technical support for a variety of Mil specs and standards (e.g., MIL-PRF-38534 and MIL-STD-883). Tom is an active IMAPS member and Society Fellow. He teaches a full day industry course titled "Hermeticity and Near hermetic Packaging Concepts" at public conferences throughout the year and has worked as a hermeticity consultant for numerous military and aerospace companies. He has a B.S. in Materials Engineering from Lehigh University and a Masters from the University of Utah.*

Session 1: Lead Free Solder

Chair: Benson Chan, Endicott Interconnect Technologies

1:00 pm - 3:00 pm

Solder Pad "Cratering" A Growing Concern for Lead Free Soldered Electronics
Venkatesh Raghavan, Michael Eberhart, Brian Roggeman, Peter Borgesen, State University of New York at Binghamton

On the Life of Lead Free Solder Joints in Cycling with Varying Amplitudes
Linlin Yang, V. Raghavan, B. Roggeman, L. Yin, P. Borgesen, State University of New York at Binghamton

Quantitative Assessment of Effects of Long Term Aging on Sn-Ag-Cu Solder Joint Reliability
Vikram Venkatadri, Peter Borgesen, K. Srihari, State University of New York at Binghamton; Liang Yin, Universal Instruments Corp.

Next Generation PoP Pastes for Electronics Assembly
Jim Hisert, Brandon Judd, Indium Corporation

Break: 3:00 pm - 3:15 pm

Session 2: Regulations & Standards

Chair: Erica Folk, Northrop Grumman Corporation

3:15 pm - 5:30 pm

Moisture Sensing in Microelectronic Packages
Thomas J. Green, TJ Green Associates LLC

Evaluation of the Performance of RoHS Compliant Thick Film Conductors with Various Lead Free Solder Alloys
Samson Shahbazi, Meg Tredinnick, Mark Challingsworth, Heraeus Materials Technology LLC

Counterfeit Detection in the Electronics Industry
Anne Poncheri, Jeff Shearer, Silicon Cert Laboratories

Identifying and Working with ITAR Regulations
Kelly Raia, American River International

Reception in Exhibit Hall: 5:30 pm – 7:00 pm

Mid-Atlantic Tabletop Exhibition

"An opportunity to talk to industry leaders"

Exhibit Hours

Friday - June 18 10:00 am - 5:00 pm

Refreshment Break, Lunch will be held in the Exhibit Hall.

Tabletop Registration Fees

	On/Before 5/26/10	After 5/26/10
IMAPS Corporate Member	$300	$300
Non-Corporate Member	$400	$400

Included with your registration: one six-foot draped table, two chairs, carpeting, one copy of Presentations on CD-ROM, one copy of the final list of attendees (sent after the event) and exhibit hall admission for two booth personnel. CD-ROM of Presentations will be mailed 15 business days after the event.

Only tabletop exhibits will be accepted. Free standing exhibits will not be allowed at this event.

For more information, visit www.imaps.org/midatlantic
or contact the Vendor Chair (Leo Garvey, LFG Micro, Leo.Garvey@LFGMicro.com)
or IMAPS Staff (Ann Bell at 202-548-8717, abell@imaps.org).

Friday, June 18, 2010

Registration: 7:00 am - 5:00 pm

Breakfast: 7:30 am - 8:20 am

Opening Remarks: 8:30 am - 8:45 am

General Chair: Voya Markovich, Endicott Interconnect Technologies

Exhibit Hours: 10:00 am - 5:00 pm

(Refreshment Break & Lunch will be held in the Exhibit Area)

Keynote Presentation: 8:45 am - 9:30 am

Title: 3D Packaging

Speaker: George Katopis, IBM

Session 3: Nanomaterials in Packaging

Chair: Michael Salloum, MLES

9:30 am - 12:30 pm

"Green" Nanocomposites for Electronic Packaging
Mark D. Poliks, Rabindra N. Das, Konstantinos I. Papathomas, Endicott Interconnect Technologies, Inc.

Printing Conductive Traces using Nano Silver-Based Inks
David Van Heerden, Hichang Yoon, Yu Do, Zhihao Yang, NanoMas Technologies, Inc.

Nanomaterials Construction for Thermal Interface Materials
Howard Wang, State University of New York at Binghamton

Mechanical Behavior of Silver Nanoparticle Films
Liwei Huang, Howard Wang, State University of New York at Binghamton

Design, Fabrication, Electrical Characterization and Reliability of Nanomaterials Based Embedded Passives
Rabindra Das, John M. Lauffer, Steven G. Rosser, Endicott Interconnect Technologies, Inc.

Session 4: Advanced Component Packaging

Chair: Ray Fillion

9:30 am - 12:30 pm

MEMS Device Sealing in a High Vacuum Atmosphere Achieving Long Term Reliable Vacuum Levels
Bruce Wilson, Paul Barnes, SST International

Break in Exhibit Hall: 10:00 am - 10:30 am

Solders in LED Packaging
Seth Homer, Indium Corporation

Reliability of a Chip Scale Packaged (CSP) Enhanced Linear Image Sensor
Awni Qasaimeh, Mahesh Murthy, Frank Andros, Susan Lu, State University of New York at Binghamton

Manufacturing and Reliability Challenges With QFN
Greg Caswell, DfR Solutions

Challenges in Assembly and Reliability of Package on Package
Brian Roggeman, Michael Meilunas, Universal Instruments Corp.

Lunch in Exhibit Hall: 12:30 pm - 3:00 pm

Lunch Served: 12:30 pm - 1:15 pm

Poster Session in Exhibit Hall

Chair: TBA

12:30 pm - 3:00 pm

Microstructure Evolution of Pb-Free Solder Alloys in Mechanical Fatigue Testing
Luke A. Wentlent, Liang Yin, Linlin Yang, Peter Borgesen, State University of New York at Binghamton

An Empirical Model for Lead Free Solder Joint Life in Thermal Cycling
Younis Jaradat, Awni Qasaimeh, Susan Lu, Peter Borgesen, State University of New York at Binghamton

Crack Behavior in Lead Free Solder Joints during Isothermal and Thermal Cycling
Awni Qasaimeh, Peter Borgesen, Susan Lu, State University of New York at Binghamton

Surface Mounted Components Reflow Process Temperature Profile Study
Jianjun Jiang, Krishnaswami Srihari, Ross Havens, State University of New York at Binghamton

Design and Packaging of a Device for Fingerprint Based Access Control System
Sandeepsarma Josyula, Temple University

Hardware Design for a Ultra-High Processing Throughput Computer
Son Nguyen, Bjorn Gruenwald, Joan Delalic, Temple University

Metallurgy Change at the Gold-Solder Bump Joint
Yong-Bin Sun, Ui-Jung Choi, Kyonggi University

Corporate Sponsor Ignite Session

Moderator: Leo Garvey, LFG Micro
1:15 pm - 2:00 pm
A fast paced focused 10 minute presentation from each of our corporate sponsors.

Vendor Open Mic: 2:00 pm - 3:00 pm

Session 5: Wire/Ribbon Bonding and Ceramic Substrates

Chair: Lee Levine, Process Solutions Consulting
3:00 pm - 5:00 pm

Wire Bond Surfaces for Large Diameter Aluminum Wire and PowerRibbon® Bonding
Mike McKeown, Orthodyne Electronics

Separable Ribbon Contact for High Frequency Modules
George Glatts, Z-Axis Connector Company

Process Integrated Quality Control Improves Wire Bonding Reliability
Roberto Gilardoni, Bill Maldonado, Hesse & Knipps Semiconductor Equipment

Techniques and Materials for Advanced Radars and Communications
Arne Knudsen, Jerry Aguirre, Mark Eblen, Iris Labadie, Joseph Tallo, Andrew Piloto, Kyocera America, Inc.

Session 6: Advanced Interconnects

Chair: John Mazurowski, Penn State University
3:00 pm - 5:00 pm

Embedded Power Packaging for Low Loss, High Performance
Chuck Bauer, Heuhaus Herb, Ray Fillion, TechLead Corp.

High Bandwidth Density and Low Cost Optical Interconnects and Packaging
Frank Libsch, IBM

Organic Optical Waveguides
How Lin, Benson Chan, Endicott Interconnect Technologies Inc.

The Merits of Open Bath Immersion Cooling of Datacom Equipment
Steve A. Pignato, Phillip E. Tuma, 3M

Closing Remarks: 5:00 pm
General Chair: Voya Markovich, Endicott Interconnect Technologies

Corporate Sponsorship

(5 available)
$1000 each

**For more information,
visit www.imaps.org/midatlantic
or contact Ann Bell at 202-548-8717,
abell@imaps.org**

Registration Deadlines

Early Registration, Exhibit Reservation and Hotel Deadlines.

**Early Registration Discount Ends
May 26, 2010**
Session Chair, Speaker/Presenter must register for the workshop.

**Extended Abstract Due:
May 28, 2010**
Email extended abstract in PDF format only to jmorris@imaps.org.

Registration Form

Register On-Line at www.imaps.org/midatlantic

Mid-Atlantic Microelectronics Conference: June 17 - 18, 2010

❑ Dr. ❑ Mr. ❑ Ms. Member ID# _______________

First Name________________________________M.I.____________Last Name______________________________

Company/Affiliation____Job Position___________________________

Address____

City___________________________ State______ Zip____________ Country______________________________________

Phone________________________ Fax________________________ Email______________________________________

Payment

MMCPROG

Workshop Fee:	$____________
Professional Development Course:	$____________
Tabletop Fee:	$____________
Corporate Sponsor:	$____________
Additional Purchases:	$____________
Total Payment Due:	$____________

For Wire Transfer information call 202-548-4001

❑ Enclosed is a check payable in US funds to IMAPS

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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. Workshop Cancellations will be refunded (less a $50 processing fee) only if written notice is postmarked on or before **Friday, June 4, 2010**. No refunds will be issued after that date.

Registration Fees: Early Registration Ends 5/26/10

Workshop Fees

	(On or before **5/26**)	(After **5/26**)
❑ Member (IMAPS)	$75	$100
❑ Non-member*	$125	$150
❑ Speaker ❑ Chair	$50	$75
❑ Student	$10	$25
❑ Exhibits Only (does not include lunch)		**FREE**
❑ Lunch Ticket		$30

**Includes one-year IMAPS individual membership/renewal. Does not apply to corporate or affiliate memberships. Workshop Fee includes: abstract book, meals listed and a CD of Presentations. CD of Presentations will be mailed 15 business days after the event.*

Professional Development Course (1/2 Day)

June 17th: 1:00 pm - 5:00 pm

❑ PDC1: Wire Bonding (Member)	$300	$300
❑ PDC1: Wire Bonding (Non-Member)	$400	$400
❑ PDC2: Near Hermetic...(Member)	$300	$300
❑ PDC2: Near Hermetic...(Non-Member)	$400	$400

Tabletop Exhibit Booth

❑ Member (IMAPS)	$300	$300
❑ Non-member	$400	$400

Exhibits will be on June 18th.

❑ Corporate Sponsorship (5 available) $1000

Additional Purchases

❑ CD of Presentations *(Member Rate)*	$200	$200
❑ CD of Presentations *(Non-Member Rate)*	$300	$300
❑ Add to Ship in the US	$7	$7
❑ Add to Ship Overseas	$25	$25

Hotel Reservation *(Hotel Cut-off is May 26, 2010)*

Reservation **must** be made directly with:

Atlantic City Hilton
Boston Ave. & The Boardwalk
Atlantic City, NJ 08401

Reservations: 800-257-8677

Please reference IMAPS when making reservations by phone.

IMAPS Room Rate:

6/16 & 6/17/10 - $65 per night
6/18/10 - $89 per night

IMAPS Registration
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