

ADVANCE PROGRAM AND REGISTRATION

# OPTOELECTRONICS DEVICE PACKAGING AND MATERIALS

## TOPICAL WORKSHOP AND EXHIBITION

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**RADISSON HOTEL BETHLEHEM**  
**OCTOBER 7 - 10, 2003**



**GENERAL CHAIR:**  
**Raymond A. Pearson**  
*Lehigh University*  
P: 610-758-3857  
rp02@lehigh.edu

**TECHNICAL PROGRAM CHAIR:**  
**Ben Velsher**  
*OptoVia Corporation*  
P: 978-266-2830  
velsher@optovia.com

**EXHIBITS CHAIR:**  
**Elizabeth Stasik**  
*NorCom Systems, Inc.*  
P: 610-631-5043  
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SPONSORED BY:

INTERNATIONAL MICROELECTRONICS AND  
PACKAGING SOCIETY (IMAPS) & THE  
IMAPS KEYSTONE CHAPTER

### PROFESSIONAL DEVELOPMENT COURSES - (1/2 DAY)

**TUESDAY, OCTOBER 7 8:30 AM - 1 PM**

OPTOELECTRONICS PACKAGING AND PROCESSES(PDC1)  
INSTRUCTOR: THOMAS J. GREEN, NATIONAL TRAINING CENTER  
FOR MICROELECTRONICS

OVERVIEW OF OPTICAL-FIBER COMMUNICATION AND COMPONENTS(PDC2)  
INSTRUCTOR: WILLIAM R. HEFFNER, SCITONICS

### EXHIBITION

**THURSDAY, OCTOBER 9 NOON - 5:30 PM**

REFRESHMENT BREAKS AND LUNCH SERVED IN THE EXHIBITS AREA

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### TECHNICAL PROGRAM OCTOBER 7 - 10, 2003

#### SESSION I: OPTOELECTRONIC PACKAGING OVERVIEW

Session Chairs: Garo Khanarian, *Rohm & Haas*; Alan Lyons, *Lucent Technologies*

#### SESSION II: ASSEMBLY AND AUTOMATION IN OPTOELECTRONICS

Session Chairs: Robert Irvin, *Coviant*; Jeffrey Shakespeare, *Consultant*

#### SESSION III: MATERIALS FOR OPTOELECTRONICS I

Session Chair: Dave Saums, *Ceramics Process Systems Corporation*

#### SESSION IV: MATERIALS FOR OPTOELECTRONICS II

Session Chair: Dave Saums, *Ceramics Process Systems Corporation*

#### SESSION V: RELIABILITY IN OPTOELECTRONICS PACKAGING

Session Chairs: Alex Rosiewicz, *EM4 Photonics*; Daniel Meerovich, *ASIP*

#### SESSION VI: OPTOELECTRONIC PACKAGE DESIGN

Session Chair: Ben Velsher, *OptoVia Corporation*

#### SESSION VII: CONSORTIA/UNIVERSITY PROGRAMS IN OPTOELECTRONICS

Session Chairs: Mike Lanagan, *Penn State*; Shapna Pal, *Department of Defense*

**SAVE ON TECHNICAL PROGRAM REGISTRATION  
WHEN YOU REGISTER ON-LINE: [WWW.IMAPS.ORG/OPTO](http://WWW.IMAPS.ORG/OPTO)**

# Tuesday, October 7

Registration: 7:00 am – 7:00 pm

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

Professional Development Courses (1/2 DAY)  
8:30 am – 1:00 pm

## PDC 1

### OPTOELECTRONICS PACKAGING AND PROCESSES

INSTRUCTOR: THOMAS J. GREEN, NATIONAL TRAINING CENTER  
FOR MICROELECTRONICS

#### DESCRIPTION

The intent of this course is to advance the students' understanding of the basic materials and processing steps used in the assembly of active optoelectronic components such as lithium niobate modulators and pump lasers. The basic processes essential to building optoelectronic components are covered including; AuSn eutectic attach of laser chips, micro alignment of fibers within the package, silicon optical bench technology, deep access wire and ribbon bonding, attachment of window lenses, hermetic sealing and optical package leak testing. In addition, material issues such as, choosing the proper adhesive and problems associated with outgassing of organic species inside the OE package are discussed. The industry has struggled to automate the manufacture of OE components and has missed out on the corresponding cost reductions. Issues in automation of OE processes and future packaging challenges will also be presented.

#### TOPICS

- Eutectic attach of laser chips using Au/Sn die attach
- Micro fiber alignment within the package cavity
- Deep access wire and ribbon bonding
- Hermetic testing of optical components using optical leak test methodologies
- Challenges in automation and assembling OE components

#### WHO SHOULD ATTEND?

This course is a must for designers, process engineers, quality inspectors and technicians interested in understanding the basic materials and processing issues relevant to assembling optoelectronic devices. An easy to follow powerpoint presentation and color photos guide the student through the intricacies of building the next generation optoelectronic assemblies

#### INSTRUCTOR BIO:

**Tom** is a respected industry consultant and adjunct Professor at the National Training Center for Microelectronics located Bethlehem Pennsylvania. At NTC $\mu$  he designs curriculum and teaches industry short courses relating to advanced microelectronics and optoelectronics manufacturing processes. He has over twenty years experience in the microelectronics manufacturing industry at Lockheed Martin and USAF Rome Laboratories. During that time period he was a senior staff engineer responsible for the materials and manufacturing processes used in building custom high reliability space qualified microcircuits and optoelectronics components for military and commercial applications. Tom has a Masters of Engineering from University of Utah and a B.S. degree in Metallurgy and Materials Engineering from Lehigh University.

## PDC 2

### OVERVIEW OF OPTICAL-FIBER COMMUNICATION AND COMPONENTS

INSTRUCTOR: WILLIAM R. HEFFNER, SCITONICS –  
OPTOELECTRONICS CONSULTING AND TRAINING

#### DESCRIPTION:

The objective of this course is to provide an overview of fiber-optic communications and the optoelectronic components that enable its capability. The course is designed for the technical professional, with or without experience in optoelectronics, who wants to see how all of the pieces fit together. The course will cover basic principles of the fiber optic transmission systems interwoven with the story of the evolving list of devices (components) and technologies that continue to expand the fiber's capacity for carrying data.

The course begins with a discussion of the information explosion and the unique capabilities of the fiber in its transmission. We examine the issues of attenuation and dispersion and illustrate the significance that the light source plays in determining both distance and bandwidth. From here we trace the evolution of optical fiber systems from the single wavelength, point to point systems of the 80s through the DWDM systems of the 90s to today's focus on wavelength routing. Components are introduced within the context of this discussion showing how greater system performance is directly linked to the unique advantages that each new device contributes. Discussions will focus primarily on the active components which include lasers, modulators (external and integrated), integrated tunable sources, fiber amplifiers (EDFA and Raman) and optical MEMS for add drop and other functions.

#### WHO SHOULD ATTEND?

This PDC is intended as an introductory level course for any engineer or technical professional working in the IC or opto process or packaging field who would like to have a better understanding of what all those OE devices are about and why others are so excited about them.

#### INSTRUCTOR BIO:

**Bill** is an optoelectronics consultant with more 25 years experience in electro-optic device technology, ranging from basic research in liquid crystals device technology to manufacturing and development positions in InP based semiconductor lasers and detectors. He was formerly a distinguished member of technical staff at Agere Systems where he was employed for most of this career. He is an active member of both OSA and IMAPS having served as opto packaging chair at several recent conferences. Bill also teaches as an adjunct member of the engineering faculty at Penn State University (GV) where he offers courses on laser and OE device physics. His educational experience includes an MS in Chemical Physics from Indiana University and a PhD in Physics from Stevens Institute of Technology. He has 15 publications and holds 6 patent in OE device related technology.

Tuesday afternoon

**OPENING REMARKS**  
**GENERAL AND TECHNICAL CHAIRS**

**SESSION I: OPTOELECTRONIC PACKAGING OVERVIEW**

2 pm – 5:30 pm

**SESSION CHAIRS:**

GARO KHANARIAN, ROHM & HAAS; ALAN LYONS, LUCENT TECHNOLOGIES

**NATIONAL ELECTRONICS MANUFACTURING INITIATIVE (NEMI)**  
**YEAR 2002 OPTOELECTRONICS ROADMAP**

Laura Turbini, University of Toronto

**CONTRACT MANUFACTURING AFTER THE BUBBLE**

Paul A. Magill, Coviant Manufacturing

**EMBEDDED OPTICAL INTERCONNECTS IN PRINTED CIRCUIT**  
**BOARDS**

Daniel Guidotti, Georgia Institute of Technology

**BREAK: 3:30 PM – 4 PM**

**ISSUES RELATED TO OPTICAL INTERCONNECTS AND BACKPLANES**

Edward S. Binkley, Promex Industries

**HIGH-BRIGHTNESS FIBER COUPLED LASER DIODE PACKAGE FOR**  
**LOW-COST, HIGH RELIABILITY APPLICATIONS**

Raj Singh, MKPA

**HERMETIC, SMALL FORM FACTOR PACKAGE FOR EDGE EMITTING**  
**OPTO-ELECTRONIC DEVICES**

Arnd Kilian, HYMITE GmbH

**WELCOME RECEPTION: 5:30 PM – 6 PM**

**DINNER: 6 PM – 7 PM**

**KEYNOTE ADDRESS**

**7 PM – 7:45 PM**

**Speaker: Tom Koch, Lehigh University**

**Exhibit Spaces Still Available!**

**Call today to reserve your spot**

**IMAPS**

**Contact: Doug Paul**

**PHONE: 202-548-8712**

**FAX: 202-548-6115**

**E-MAIL: DPAUL@IMAPS.ORG**

**Technical Workshop Registration**

Your registration fee includes Continental Breakfasts, Luncheons, Refreshment Breaks, Welcome Reception, Dinner and an Abstract Book. A CD of the Workshop Presentations will be sent to each attendee after the event.

**Professional Development Courses are offered for additional fees.**

**Technical Workshop Presentations**

If you are unable to attend the Workshop and would like a CD of the Presentations, you may purchase a copy by using the registration form. Your copy will be mailed to you after the event.

**The cost is \$100 for members; \$175 for non-members,\* plus shipping and handling. Call 202-548-4001 to reserve your CD.**

\*includes 1 year IMAPS membership at no charge

**The Hotel**

RADISSON HOTEL BETHLEHEM

437 MAIN STREET

BETHLEHEM, PA 18018

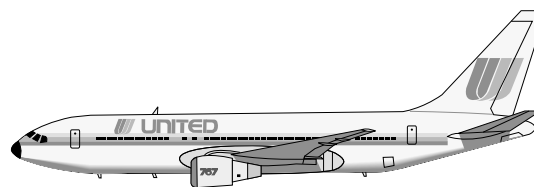
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**Travel**



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# Wednesday, October 8

REGISTRATION: 7 AM – 7 PM

CONTINENTAL BREAKFAST: 7:30 AM – 8:30 AM

## SESSION II: ASSEMBLY AND AUTOMATION IN OPTOELECTRONICS

8:30 am - Noon

SESSION CHAIRS:

ROBERT IRVIN, COVARIANT; JEFFREY SHAKESPEARE, CONSULTANT

### ADVANCED FLIP CHIP MANUFACTURING TECHNIQUES FOR OPTOELECTRONICS

J. Medernach, MRSI, A Newport Corporation Company

### LOW COST, DESKTOP PHOTONICS ASSEMBLY PLATFORM WITH NANOMETER PRECISION

Tetsuo Ohara, MKPA-Panasonic

### METALLIZED OPTICAL FIBER REQUIREMENTS FOR RELIABLE MINIDIL PUMP LASER MODULES

Nick Nelson, Flextronics Photonics

BREAK: 10 AM – 10:30 AM

### ADHESIVES AND ADHESION RELIABILITY: QUALITY, DURABILITY, & PRODUCTIVITY IN BONDED ASSEMBLIES

Nicole Langer, Dymax Corporation

### SPACE-QUALIFIABLE SIX-AXIS FIBER ALIGNMENT TECHNIQUE

Jerry Mulder, Jet Propulsion Laboratory

### OPTOELECTRONIC PACKAGING: THE NEED FOR $\pm 1 \mu\text{m}$ POST-BOND ACCURACY DEVICE BONDING

Gilbert Lecarpentier, SUSS MicroTec

LUNCH: NOON

## SESSION III: MATERIALS IN OPTOELECTRONICS I

2 pm – 5:30 pm

SESSION CHAIR:

DAVE SAUMS, CPS

### LTCC-M TECHNOLOGY FOR LED PACKAGING

Ellen S. Tormey, Lamina Ceramics, Inc.

### LOW COST, HERMETIC OPTICAL PORT USING LIQUID CRYSTAL POLYMER

A. Mahapatra, Linden Photonics, Inc.

### BONDABILITY, RELIABILITY AND YIELD BENCHMARKS FOR HIGH VOLUME Au FINE WIRE BONDING

M. Zasowski, Williams Advanced Materials

BREAK: 3:30 PM – 4 PM

### SEALING OPTICAL FIBERS WITH SOLDER GLASS: DESIGN GUIDELINES

R. Dietz, Diemat, Inc.

### TEST RESULTS FOR VARIOUS METALLIZED FIBER DEPOSITS

Robert Botkins, Shipley Company, L.L.C.

### FABRICATION AND PACKAGING TECHNIQUES FOR INTEGRATED PHOTONIC DEVICES USING POLYMER-BASED SUBSTRATE MATERIALS

Don Bitting, Photon-X, Inc.

DINNER: 5:30 PM – 6:30 PM

## SESSION IV MATERIALS IN OPTOELECTRONICS II

6:30 pm – 8 pm

SESSION CHAIR:

DAVE SAUMS, CPS

### PACKAGING AND ASSEMBLY MADE SIMPLE WITH VAPOR DEPOSITED EUTECTIC SOLDERS

John Snook, Stellar Industries Corporation

### INJECTION MOLDED PLASTIC PACKAGING FOR OPTOELECTRONIC APPLICATIONS

John W. Roman, RJR Polymers Incorporated

### TESTING THE ELECTRICAL PROPERTIES OF ZERO SHRINK HL2000 FOR MANUFACTURE INTO LOW TEMPERATURE CO-FIRED CERAMIC SYSTEMS

Steven Scrantom, Sea Ceramics Technologies

# Thursday, October 9

REGISTRATION: 7 AM – 7 PM

CONTINENTAL BREAKFAST: 7:30 AM – 8:30 AM

EXHIBITOR SETUP: 11:00 AM - NOON

EXHIBIT HOURS: NOON – 5:30 PM

*Refreshment Breaks and Lunch in the Exhibit Area*

## SESSION V: RELIABILITY IN OPTOELECTRONICS PACKAGING

8:30 am - Noon

SESSION CHAIRS:

ALEX ROSIEWICZ, EM4 PHOTONICS; DANIEL MEEROVICH, ASIP

### EVALUATION OF OPTO-ELECTRONIC COMPONENTS UTILIZING ACOUSTIC MICRO IMAGING (AMI) TECHNIQUES

Jennifer Bailey, Sonoscan, Inc.

### A METHOD FOR GETTERING GAS-PHASE CONTAMINANTS WITHIN A SEALED OPTOELECTRONIC PACKAGE

S. Wakelin, PowerNetix, Inc.

**DETERMINING LIFETIME OF SILVER-FILLED ICA'S/SOLDER  
PLATED INTERCONNECTIONS**

C. Hillman, University of Maryland

**BREAK: 10 AM – 10:30 AM**

**OPTICAL LEAK TESTING OF HERMETIC OPTOELECTRONIC DEVICES**

J. Newman, NorCom Systems Inc.

**SCANNING ACOUSTIC MICROSCOPY (SAM) FOR THE INSPECTION  
OF OPTOELECTRONICS DEVICES**

James McKeon, Sonix Incorporated

**HERMETIC PROJECTION WELDING**

Thomas E. Salzer, Hermetic, Inc.

**LUNCH IN EXHIBITS AREA: NOON**

**SESSION VI: OPTOELECTRONIC PACKAGE DESIGN**

4 pm – 6 pm

**SESSION CHAIR:**

BEN VELSHER, OPTOVIA CORPORATION

**OPTOELECTRONIC STANDARDS - THE FOUNDATION FOR RELIABLE  
IMPLEMENTATION AND ASSESSMENT**

Dieter Bergman, IPC

**PACKAGING OF A HIGH POWER MEMS OPTICAL SWITCH**

Michael Deeds, Naval Surface Warfare Center

**THERMAL DESIGN OF OPTOELECTRONIC PACKAGES**

Jeffrey Shakespeare, Lehigh University

**METALLURGICAL STUDY OF LASER WELDING JOINTS IN PHOTO-  
NIC PACKAGING**

C. W. Tan, City University of Hong Kong

**RECEPTION: 6 PM**

**DINNER: 6:30 PM – 8 PM**

**STUDENT POSTER PAPERS: 6:30 PM - 8 PM**

**Friday, October 10**

**REGISTRATION: 7 AM - NOON**

**CONTINENTAL BREAKFAST: 7:30 AM – 8:30 AM**

**SESSION VII: CONSORTIA/UNIVERSITY PROGRAMS IN  
OPTOELECTRONICS**

8:30 am - Noon

**SESSION CHAIRS:**

MIKE LANAGAN, PENN STATE UNIVERSITY; SHAPNA PAL, DEPARTMENT OF  
DEFENSE

**DIMENSIONAL STABILITY OF OPTICAL PACKAGES**

Robert Sullivan, High Density Packaging User Group International,  
Inc.

**OVERVIEW OF OPTOELECTRONIC PACKAGING EFFORTS AT  
LEHIGH UNIVERSITY**

Ray Pearson, Lehigh University

**ELECTRONIC AND MEMS PACKAGING RESEARCH AT SUNY  
BINGHAMTON**

Junghyun Cho, State University of New York at Binghamton

**BREAK: 10 AM – 10:30 AM**

**THE NSF CENTER FOR DIELECTRIC STUDIES: A COOPERATIVE  
VENTURE FOR INDUSTRY, GOVERNMENT, AND UNIVERSITIES**

Michael Lanagan, The Pennsylvania State University

**PHYSICS-OF-FAILURE RELIABILITY ASSESSMENT OF OPTOELEC-  
TRONICS AND PHOTONICS**

Patrick McCluskey, University of Maryland

**OPTOELECTRONICS PACKAGING RESEARCH WITHIN THE UIC  
AREA ARRAY CONSORTIUM**

Peter Borgesen, Universal Instruments Corporation

**CONCLUDING REMARKS: NOON**

**New Feature Available for Exhibitors**

IMAPS will provide all exhibitors an opportunity to provide up to six (6) pages of company products, services and contact information to be included on the post-event Technical Presentations CD-ROM. These CD-ROMs are provided to all technical conference attendees and are for sale through IMAPS to all industry professionals.

This new and unique feature will promote the Exhibitor's products and abilities much longer than just the Conference.

There is a charge of \$50 for this optional feature.

This equates to 6 pages of advertising for just \$50.

These submissions must be no more than six (6) pages long and must be sent, electronically, in Word or PDF format, to dpaul@imaps.org no later than October 3, 2003. **Register on back cover.**

UPCOMING IMAPS ADVANCED TECHNOLOGY WORKSHOPS...

**High-Speed Interconnect, EMC and Power Aspects of  
System Packaging for High Performance Computing Telecom  
and Test Equipment**

**Sheraton Palo Alto Hotel  
Palo Alto, California USA  
October 19 - 22, 2003**

Information will be posted on the IMAPS site as it becomes available:  
[www.imaps.org/systemspack/](http://www.imaps.org/systemspack/)

.....  
**Thermal Management for High-Performance  
Computing and Wireless Applications**

**Sheraton Palo Alto Hotel  
Palo Alto, California USA  
October 22 - 24, 2003**

Information will be posted on the IMAPS site as it becomes available:  
[www.imaps.org/thermal/](http://www.imaps.org/thermal/)

.....  
**Packaging of MEMS and Related Micro Integrated  
Nano Systems**

*In conjunction with the IMAPS 2003 Symposium - Boston*

**Sheraton Boston Hotel  
Boston, MA  
November 20 - 22, 2003**

For more information, visit [www.imaps.org/mems/](http://www.imaps.org/mems/)

.....  
**Packaging Copper/Low-K Semiconductors**

**Red Lion Hanalei Hotel  
San Diego, CA USA  
December 15 - 17, 2003**

Visit [www.imaps.org/copper](http://www.imaps.org/copper) for more information

# SCHEDULE-AT-A-GLANCE

## PROFESSIONAL DEVELOPMENT COURSES - (1/2 DAY)

**TUESDAY, OCTOBER 7 8:30 AM - 1:00 PM**

OPTOELECTRONICS PACKAGING AND PROCESSES **(PDC1)**

INSTRUCTOR: THOMAS J. GREEN, NATIONAL TRAINING CENTER FOR MICROELECTRONICS

OVERVIEW OF OPTICAL-FIBER COMMUNICATION AND COMPONENTS **(PDC2)**

INSTRUCTOR: WILLIAM R. HEFFNER, SCITONICS – OPTOELECTRONICS CONSULTING AND TRAINING

## EXHIBITION HOURS

**THURSDAY, OCTOBER 9 NOON - 5:30 PM**

REFRESHMENT BREAKS AND LUNCH WILL BE IN THE EXHIBITS AREA

## TECHNICAL PROGRAM

**TUESDAY  
OCTOBER 7, 2003**

### SESSION I:

**OPTOELECTRONIC PACKAGING OVERVIEW**

**2 pm – 5:30 pm**

#### SESSION CHAIRS:

GARO KHANARIAN,  
ROHM&HAAS; ALAN LYONS,  
LUCENT TECHNOLOGIES

### KEYNOTE ADDRESS

**7 pm – 7:45 pm**

#### Speaker:

**Tom Koch, Lehigh  
University**

**WEDNESDAY  
OCTOBER 8, 2003**

### SESSION II:

**ASSEMBLY AND AUTOMATION IN OPTOELECTRONICS**

**8:30 am - Noon**

#### SESSION CHAIRS:

ROBERT IRVIN, COVIANT;  
JEFFREY SHAKESPEARE,  
CONSULTANT

### SESSION III:

**MATERIALS IN OPTOELECTRONICS I**

**2 pm – 5:30 pm**

#### SESSION CHAIR:

DAVE SAUMS, CPS

### SESSION IV:

**MATERIALS IN OPTOELECTRONICS II**

**6:30 pm – 8 pm**

#### SESSION CHAIR:

DAVE SAUMS, CPS

**THURSDAY  
OCTOBER 9, 2003**

### SESSION V:

**RELIABILITY IN OPTOELECTRONICS PACKAGING**

**8:30 am - Noon**

#### SESSION CHAIRS:

ALEX ROSIEWICZ, EM4  
PHOTONICS; DANIEL  
MEEROVICH, ASIP

### SESSION VI:

**OPTOELECTRONIC PACKAGE DESIGN**

**4 pm – 6 pm**

#### SESSION CHAIR:

BEN VELSHER, OPTOVIA  
CORPORATION

**STUDENT POSTER PAPERS**

**6:30 pm - 8 pm**

**FRIDAY  
OCTOBER 10, 2003**

### SESSION VII:

**CONSORTIA / UNIVERSITY PROGRAMS IN OPTOELECTRONICS**

**8:30 am - Noon**

#### SESSION CHAIRS:

MIKE LANAGAN, PENN STATE  
UNIVERSITY; SHAPNA PAL,  
DEPARTMENT OF DEFENSE

## WORKSHOP LOCATION

Radisson Hotel Bethlehem

437 Main Street

Bethlehem, PA 18018

Phone: 610-625-5000, Fax: 610-867-9955

[www.radisson.com](http://www.radisson.com)

# REGISTRATION FORM

OPTOELECTRONICS DEVICE TOPICAL WORKSHOP - OCTOBER 7 - 10, 2003

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 REGISTRATION ENDS 8/29/03

### TECHNICAL PROGRAM

(On or before 8/29) (After 8/29)

<input type="checkbox"/> Member (IMAPS)	\$615	\$715
<input type="checkbox"/> Non-member (includes IMAPS membership)	\$715	\$815
<input type="checkbox"/> Speaker/Chair (includes IMAPS membership)	\$400	\$500

REGISTER ON-LINE AT [WWW.IMAPS.ORG/OPTO](http://WWW.IMAPS.ORG/OPTO) AND **SAVE**

### PROFESSIONAL DEVELOPMENT COURSES (1/2 DAY\*)

<input type="checkbox"/> Optoelectronics Packaging (PDC1)	\$300	\$400
<input type="checkbox"/> Overview of Optical-Fiber (PDC2)	\$300	\$400

PDCs will be on 10/7 from 8:30 am to 1:00 pm

### ADDITIONAL PURCHASES

<input type="checkbox"/> Spouse/Guest (meals only)	\$400	\$400
<input type="checkbox"/> CD of Presentations (Member Rate)	\$100	\$100
<input type="checkbox"/> CD of Presentations (Non-Member Rate)	\$175	\$175
<input type="checkbox"/> Add to Ship in the US	\$7	\$7
<input type="checkbox"/> Add to Ship Overseas	\$25	\$25
<input type="checkbox"/> Exhibits Only Admission	\$10	\$10

### EXHIBIT SPACE (EARLY REGISTRATION ENDS 8/29/03)

<input type="checkbox"/> IMAPS Corporate Member	\$325	\$425
<input type="checkbox"/> Non-Corporate Member	\$425	\$525
<input type="checkbox"/> CD-ROM participation....see page 5	\$50	\$50

Included with your exhibit registration: 1-six foot draped table, 2 chairs, carpeting, exhibit hall admission for 2 booth personnel. 1-Technical Presentations CD-ROM and a list of attendees, which will be sent to you after the event. Full Technical Workshop registrations and Professional Development Courses are available at an extra cost, fees are above. **Booth Cancellation Policy:** Booth cancellations made before 8/21/03 will receive a refund minus \$100 handling fee. Booth cancelled after 8/21/03 will not be refunded.

### Housing (Hotel Cut-off is August 29, 2003)

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

Radisson Hotel Bethlehem  
437 Main Street  
Bethlehem, PA 18018  
Phone: 610-625-5000, Fax: 610-867-9955  
[www.radisson.com](http://www.radisson.com)

When making reservation, please reference IMAPS.

Single: \$119; Double: \$129

Radisson Hotel Bethlehem 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.

## PAYMENT

Registration Fee: \$ \_\_\_\_\_

Professional Courses: \$ \_\_\_\_\_

Additional Purchases: \$ \_\_\_\_\_

Exhibit Space: \$ \_\_\_\_\_

Total Payment Due: \$ \_\_\_\_\_

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IMAPS Registration  
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