Call for Papers

SPIE's International Symposium

Micromachining and Microfabrication

25–29 January 2004
San Jose Convention Ctr.
San Jose, California USA

Conferences • Courses • Exhibition

M. Edward Motamedi, Revoltech Microsystems
Rajeshuni Ramesham, Jet Propulsion Lab.
2004 Symposium Chairs

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SPIE's International Symposium

Micromachining and Microfabrication

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Plan Now to Participate!

Share your research activities with colleagues, sponsors, technologists, engineers, and clients in the growing industry of micromachining and microfabrication of MEMS and MOEMS. Microfabricated electromechanical and optical components by batch processing provide the missing links to the mass-produced miniaturized products and cost leadership/advantage of the future. Be a part of this evolution by attending this international premium symposium event.

As we move toward our 9th annual symposium, we recognize an exceptional growth in the fields of MEMS/MOEMS and the tremendous benefits of introducing these technologies to a much bigger audience. Being a part of Photonics West, where more than 14,000 attendees gather from over 43 countries at the heart of Silicon Valley and being co-located with other Photonics West symposia on Biomedical Optics, Laser Applications, and Optoelectronics all add value to our symposium and make it an ideal forum for discussing emerging applications of microtechnologies in these hot areas.

It is our goal to provide papers in new developments of MEMS/MOEMS technologies at both basic research and commercialization stages. One of the unique features of this symposium is the strong presence of industrial and international participants.

Our symposium brings seven exciting conferences to the forefront: Micromachining and Microfabrication Process Technology; Reliability, Testing, and Characterization; MEMS/MOEMS Components and their Applications; MicroFluidics, BioMEMS and Medical Microsystems; MOEMS & Miniaturized Systems, Micromachining Technology for Microoptics and Nanooptics, and MOEMS Display & Imaging Systems. These technical conferences entertain audiences with excellent keynote speakers, invited papers, outstanding plenary speakers, exciting panel discussions, and many selected short courses. As a participant, you will have the opportunity to meet innovative people, take initiative, and motivate yourself towards your goals.

We look forward to seeing you in 2004 in San Jose, and encourage your submission of abstracts for our conferences and subsequently submit your manuscripts towards SPIE's onsite proceedings.

M. Edward Motamedi,
Revoltech Microsystems
2004 Symposium Chair

Rajeshuni Ramesham,
Jet Propulsion Laboratory
2004 Symposium Cochair

Micromachining and Microfabrication Process Technology IX (mfo1)

Conference Chairs: **Mary-Ann Perez-Maher**, MEMSCAP Inc.; **Jerome F. Jakubczak**, Sandia National Labs.

Program Committee: **Eric Donzier,** Schlumberger Cambridge Research; **Kazuhiro Hane,** Tohoku Univ.; David Koester, MEMSCAP, Inc., **Franz Lärmer,** Robert Bosch, GmbH; **Tamal Mukherjee,** Carnegie Mellon Univ.

Successful MEMS and MOEMS products depend on the development of novel and cost-effective manufacturing techniques and processes. MEMS manufacturing brings together researchers from multidisciplinary backgrounds and builds on the fabrication and manufacturing technologies that have been developed by the VLSI and precision engineering industries.

This conference is intended to bring together process developers and integrators, device researchers, and manufacturing engineers who are interested in the present and future state of MEMS/MOEMS process technologies. The topics cover in the conference will be novel processes, process integration of MEMS/MOEMS and ICs, new applications of existing process technology, and manufacturing-driven process development. Special emphasis will be placed on the application of MEMS/MOEMS processes to new commercial products and issues such as manufacturability, yield management, and packaging associated with bringing these products to high-volume manufacturing.

The topics for this conference include, but are not limited to:

Nanotechnologies

Manufacturing for MEMS/MOEMS
- bulk and surface micromachining
- planarization techniques for MEMS
- cleaning, dicing, bonding, and assembly methods
- fabrication technologies for new categories of devices such as microphotonic and microfluidic devices
- process integration between MEMS/MOEMS and IC process
- manufacturable packaging techniques
- wafer level packaging
- processing effects on yield and reliability
- yield management and enhancement.

High-Aspect Ratio Microfabrication Technologies
- DRIE and deep trench etching
- thick resist materials and processes
- conformal deposition and trench fill processes
- microelectroforming.

Materials
- thick polysilicon, porous silicon, electroformed materials, polymers, and novel materials
- physical properties (mechanical, thermal, electromagnetic, etc.)
- materials compatibility
- non-silicon materials for MEMS.

MEMS Foundries
- multi-project-wafers (MPW) capabilities
- technology transfer
- access to foundry facilities.

Reliability, Testing, and Characterization of MEMS/MOEMS III (mfo2)

Conference Chairs: **Danelle M. Tanner**, Sandia National Labs.; **Rajeshuni Ramesham**, Jet Propulsion Lab.

Program Committee: **Susanne Arney**, Lucent Technologies/Bell Labs.; **Bharat Bhushan**, The Ohio State Univ.; **Kenneth A. Gall**, Univ. of Colorado; **Allyson L. Hartzell**, Analog Devices, Inc.; **Albert K. Henning**, Redwood Microsystems, Inc.; **Ryan M. Hickey**, Bookham Technology (Canada); **Richard C. Kullberg**, SAES Getters USA, Inc.; **Leslie M. Phinney**, Univ. of Illinois/Urbana-Champaign; **Srinivas A. Tadigadapa**, The Pennsylvania State Univ.; **Jeremy A. Walraven**, Sandia National Labs.; **Ann Witvrouw**, IMEC (Belgium)

Micro-electro-mechanical systems (MEMS) and micro-opto-electro-mechanical systems (MOEMS) is a rapidly growing, exciting miniaturized technology (gyroscopes, accelerometers, pressure sensors, flow sensors, RF MEMS, micromirrors, microshutters, magnetic MEMS, microactuators, micropower sources, microvalves, micro MEMS optical components, etc.) envisioned to reach a significant commercial market in aerospace, biological, chemical, optical, automobile industries, communications, and consumer electronics. The purpose of the conference is to provide a technical forum to present and discuss recent advances that were made in reliability, testing, and characterization of MEMS/MOEMS for various applications.

We are soliciting papers related, in general, to reliability, testing, and characterization of MEMS/MOEMS, which includes life cycle predictability of materials, devices, Back End of Line (BEOL) processes, and packaging of MEMS/MOEMS and related applications.

Topics of Interest:

MEMS/MOEMS Reliability Methodology
- reliability, testing, characterization, and metrology of MEMS devices and systems
- aging or dormancy studies of MEMS/MOEMS devices or materials
- life cycle predictability of materials in MEMS/MOEMS, inspection, analysis, qualification procedures, and verification
- design of experiments
- highly accelerated stress testing (HAST) of MEMS/MOEMS, highly accelerated stress screening, and environmental testing of MEMS/MOEMS
- physics of failure
- modeling of MEMS/MOEMS reliability and their systems
- effects of radiation on MEMS systems
- electrostatic discharge (ESD) effects on MEMS systems
- characterization using Scanning Laser Doppler vibrometry
- reliability issues of actuators, microvalves, micropumps, microchannels, optical MEMS
- reliability and limitations of shape memory alloys
- new tools to assess the reliability of MEMS/MOEMS
- testing of MEMS/MOEMS in microgravity
- issues in integration of MEMS/MOEMS and ICs
- measurement techniques and properties
- statistical characterization
- MEMS/MOEMS scaling issues
- qualification of MEMS/MOEMS devices or systems
- thermo-mechanical and thermo-hydraulic issues in MEMS design.
- shock and vibration testing and characterization
- metrology and calibration of MEMS/MOEMS.

Back End of Line (BEOL) Process and Packaging
- MEMS/MOEMS devices and their BEOL process reliability issues
- production and yield improvement; yield improvement by reducing stiction, process reliability
- nondestructive evaluation of packaged MEMS/MOEMS systems (x-ray, surface acoustic microscopy (SAM)
- MEMS/MOEMS parametric test methods and/or test structures used to assure fabrication processes
- reliability of MEMS/MOEMS release methods and techniques
- commercial-off-the-shelf (COTS) MEMS/MOEMS systems reliability and packaging
- reliability of packaging materials
- hermeticity, leak testing, helium leak bomb testing for reliability, and getters to enhance reliability
- new testing tools to monitor the hermeticity in wafer level packaging
- quasi-hermetic (near-hermetic) packaging of MEMS and MOEMS
- reliability of thin-film getters and activation techniques
- MEMS bonding materials and wafer bonding reliability
- wafer-level packaging reliability of MEMS/MOEMS
- reliability of device and packaging simulations
- solder joint reliability in MEMS/MOEMS systems
- reliability of MEMS/MOEMS and their packaging in extreme and harsh environments
- predictions of life of packaged MEMS systems
- packaging and integration of MEMS/MOEMS
- reliability of lead free solders in MEMS/MOEMS packaging
- effect of tin whiskers in MEMS packaging and their reliability.

Reliability of MEMS Materials and Surfaces
- methods to characterize or measure surface effects such as stiction and adhesion
- reliability of self-assembled monolayers (SAMs)
- lubrication of MEMS
- reliability of critical point drying methods
- reliability of coating materials in MEMS microstructures and systems
- reliability of materials in BioMEMS, micropropulsion, MEMS field emitters and flat panel displays
- tribology (as it relates to reliability) of surfaces and materials in MEMS.
- micro/nano tribology in MEMS/NEMS
- adhesion issues in MEMS/MOEMS.

Call For Papers

MEMS/MOEMS Components and Their Applications (mf03)

Conference Chair: **Siegfried W. Janson**, The Aerospace Corp.

Cochair: **Albert K. Henning**, Redwood Microsystems, Inc.

Program Committee: **Gogoi P. Bishnu**, Motorola; **Quanfang Chen**, Univ. of Central Florida; **Christopher L. Chua**, Palo Alto Research Ctr.; **Paul Stanley**, Nanyang Technological Univ. (Singapore); **Srinivas A. Tadigadapa**, The Pennsylvania State Univ.; **William C. Tang**, Univ. of California/Irvine; **Wanjun Wang**, Louisiana State Univ.; **Eui-Hyeok Yang**, Jet Propulsion Lab.

This conference focuses on MEMS components and devices in automotive, aerospace, information technology, industrial process control, and communications systems. Worldwide MEMS production is still growing exponentially with time and new MEMS applications continue to appear. MEMS can also provide "smaller, faster, cheaper" capabilities for many traditional functions. What are the latest MEMS devices and what are their applicatins?

The objective of this conference is to bring together researchers, engineers and practitioners to present the latest accomplishments and future directions in the application of MEMS. Our conference will look at these devices, in various sectors of commerce, to see what the future holds.

Papers are solicited on the following and related topics:

Devices and Components
- pressure, flow, temperature, chemical, and magnetic sensors
- accelerometers and rate gyros
- earth, sun and star sensors
- fluidic sensors, actuators, and microvalves for propellant handling
- thermal switches and variable emissivity surfaces
- microthrusters and synthetic jet actuators
- micropower generators
- microrelays and switches
- micro RF switches, resonators and filters, variable capacitors, and inductors
- micro-opto-electro-mechanical devices in spacecraft
- integrated MEMS + electronics devices, sensor readout concepts
- micromechanical springs, bearings, gears, connectors, etc.

Applications
- RF and optical communications
- data storage
- automotive safety and control systems, health and status monitoring
- transportation system monitoring and intelligent networking
- aerospace vehicle health and status monitoring
- aerospace vehicle navigation and control
- intelligent consumer goods
- manufacturing process monitoring and control
- spacecraft systems
- miniature spacecraft and air vehicle design
- personal computer peripherals
- computer-aided manufacturing
- robots.

Microfluidics, BioMEMS and Medical Microsystems II (mf04)

Conference Chairs: **Peter Woias**, Albert-Ludwigs-Univ. Freiburg/IMTEC (Germany); **Ian Papautsky**, Univ. of Cincinnati

Cochair: **Isabelle Chartier**, CEA-LETI (France)

Program Committee: **Chong H. Ahn**, Univ. of Cincinnati; **Fumihito Arai**, Nagoya Univ. (Japan); **Holger Becker**, IIP-Technologies GmbH (Germany); **A. Bruno Frazier**, Georgia Institute of Technology; **William R. Heineman**, Univ. of Cincinnati; **Raymond P. Mariella, Jr.**, Lawrence Livermore National Lab.; **Pieter Telleman**, Danmarks Tekniske Univ. (Denmark); **Wanjun Wang**, Louisiana State Univ.

Microfluidic devices and systems have created an enormous interest in many application fields of chemistry, life sciences, and medicine, as they are offering many advantages over existing macroscale systems including compact size, disposability, higher speed and parallelism of analyses, increased functionality and decreased sample/reagent volumes. Especially in the life sciences a high dynamics of microfluidics-related research is observed: The interaction of microsystems with living cells or tissue opens up the road to novel methods of medical applications, diagnostic as well as therapeutic, giving the field BioMEMS additional impact. With that, the range of objects of interest has expanded from the molecular scale over single cells to more complex biological objects, and finally, living organisms. Last, but not least, the conventional methods in medical technology also shift towards miniaturization and MEMS technology, namely minimally invasive surgery, in vivo and ex vivo monitoring or smart implants.

For many of these applications microfluidics and other MEMS technologies are essential, as they provide the functional basis of many research tools as well as commercial devices and applications. Consequently, over the past several years there has been a significant increase in the activities associated with understanding, development and application of micromechanical and microfluidic devices and systems for BioMEMS and medical microsystems. The focus of this conference is therefore to bring together the international community of researchers, educators, and practitioners in these research areas to present and discuss the latest results on the development of microfluidics, related MEMS technologies, systems and applications for BioMEMS, life sciences and medical applications.

Papers are solicited on the following and on related topics:

Microfluidic Components and Applications
- fluid delivery, transport and control
- microvalves and micropumps
- micromixers and microreactors
- heating/cooling systems
- flow sensors
- CAD, modelling and simulation.

Microfabrication Technologies for BioMEMS and Microfluidics
- silicon and polymer-based fluidic systems
- fluidic modules and interconnects
- fluidic packaging and assembly
- microstructuring of organic materials.

BioMEMS and Medical Microsystems
- sensors and systems for in vitro/in vivo monitoring and diagnosis
- cell and cell-system handling
- biohybrid systems
- cell-chip interface systems
- MEMS-human interfaces, smart implants
- CAD, modelling, and analysis.

IMPORTANT DATES!

Abstract Due Date: 16 June 2003
Manuscript Due Date: 3 November 2003

ABSTRACT SUBMISSION/ABSTRACT BOOK

Abstracts submitted via www.spie.org/info/pw (250 words) and accepted by the conference chair(s) for presentation at the meeting will be printed in an Abstract Book distributed to attendees of the symposium.

***Please Note:** submissions imply the intent of at least one author to register, attend the symposium, and present the paper either orally or in poster format.

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MOEMS and Miniaturized Systems IV (mfo5)

Conference Chair: **Ayman El-Fatatry**, BAE SYSTEMS (United Kingdom)

Cochairs: **Peter A. Krulevitch**, Lawrence Livermore National Lab.; **Hubert K. Lakner**, Fraunhofer-Institut für Mikroelektronische Schaltungen and Systeme (Germany)

Program Committee: **Susanne Arney**, Lucent Technologies/Bell Labs.; **Kris Baert**, IMEC (Belgium); **Victor M. Bright**, Univ. of Colorado/Boulder; **William D. Cowan**, Air Force Research Lab.; **David L. Dickensheets**, Montana State Univ.; **Fred M. Dickey**, Sandia National Labs.; **Jean-Christophe Eloy**, YOLE Development (France); **Hans-Peter Herzig**, Univ. de Neuchatel (Switzerland); **Koichi Imanaka**, Omron Corp. (Japan); **Lih-Yuan Lin**, Tellium, Inc.; **Justin D. Mansell**, Intellite, Inc.; **Todd R. McIntyre**, Microvision, Inc.; **Olivier M. Parriaux**, Univ. Jean Monnet Saint-Etienne (France); **Ryszard J. Pryputniewicz**, Worcester Polytechnic Institute; **Patric R. Salomon**, 4M2C PATRIC SALOMON (Germany); **Olav Solgaard**, Stanford Univ.; **Charles T. Sullivan**, Sandia National Labs.; **Steve J. Walker**, Integrated Micromachines Inc.; **Steven T. Walsh**, Univ. of New Mexico; **James S. Wilkinson**, Univ. of Southampton (United Kingdom)

There is a little doubt that the telecommunications infrastructure across the world continues to expand at a staggering rate in response to an ever-increasing demand for bandwidth and connectivity. Addressing this demand are various novel and emerging technologies of which microsystems (MOEMS and MEMS/MST) and its associated by-products offer the most promising solutions.

This is evidenced through the large number of organizations, which, over the past decade, have emerged with novel developments in component design aimed at exploiting the proliferation of optical fiber and optical sensing systems as well as optical/visual display techniques.

Moreover, the rapid, worldwide installation of optical-based systems, for telecommunications and sensing alike, has given rise to a phenomenal growth in the number and size of manufacturers of optical components and devices. Although, initially, such manufacturers relied on costly precision-based engineering to produce optical components such as splices, switches and alignment structures, techniques have evolved to embrace micromachining as the basis of low-cost manufacturing for, mass-produced, miniaturized components. These components, currently, form the basis of what are termed as micro-opto-electro-mechanical systems (MOEMS).

This conference on MOEMS and miniaturized systems will address the various aspects relating to device design concepts and applications as well as systems and applications, technology integration, technology commercialization, market considerations, and the fabrication techniques being developed for producing low-cost components. In essence, the conference will focus on MOEMS-enabled capabilities for all applications including telecommunications, displays and sensing/monitoring systems.

More specifically, the presentations at this conference are invited to address one (or more) of the following, generic, categories:

Components
- novel miniaturized optical components and instruments
- micromachined components for optical beam manipulation, including bench-on-a-chip
- fiber optic passive and active components such as WDM devices and switches
- optical scanning systems and techniques
- materials for MOEMS devices, including silicon, silica, non-silicon materials and polymers.

Applications
- MOEMS for telecommunication applications
- MOEMS for sensing systems
- MOEMS-based display and beam-steering systems
- MOEMS-based adaptive optics systems and applications
- MOEMS-based techniques for presence and object detection
- actuators for optical MEMS applications
- MOEMS for medical diagnostics and health monitoring (Bio-MOEMS)
- micro-robotics with optical sensing.

Technology Development
- miniaturized “on-machine” inspection (OMI) instrumentation
- optical beam shaping, steering and manipulation for lithography
- microsystem fabrication techniques for MOEMS
- integration of CMOS MEMS for optical applications
- MOEMS-based III-V and II-VI compound semiconductors.
- on-chip optical processing
- integration of photonics and MEMS (fabrication and functionality)
- MOEMS state/position sensing and feedback for alignment
- new approaches for MOEMS fabrication technologies (e.g. imprinting)
- novel packaging schemes for MOEMS devices
- MOEMS technology transfer to manufacturing
- interfacing techniques for MOEMS.

Markets
- MOEMS commercial products
- market predictions and future opportunities
- technology Roadmaps and technology evolution.

Clearly, presentations addressing other areas of interest related to the conference theme, not mentioned above, will also be considered.

Micromachining Technology for Microoptics and Nanooptics II (mfo6)

Conference Chairs: **Eric G. Johnson**, CREOL/Univ. of Central Florida; **Gregory P. Nordin**, The Univ. of Alabama in Huntsville

Program Committee: **Lahsen Assoufid**, Argonne National Lab.; **Erez Hasman**, Technion-Israel Institute of Technology (Israel); **Shanalyn A. Kemme**, Sandia National Labs.; **Rajesh Menon**, Massachusetts Institute of Technology; **Luiz G. Neto**, Univ. de Sao Paulo (Brazil); **Yuzo Ono**, Ritsumeikan Univ. (Japan); **Dennis W. Prather**, Univ. of Delaware; **Thomas J. Suleski**, Digital Optics Corp.; **Andreas Tuennermann**, Friedrich-Schiller-Univ. Jena (Germany)

This conference focuses on micromachining and micro-/nanofabrication technologies for producing microoptical and nanooptical components such as diffractive optics, microrefractive optics, guided wave optics, holographic optics, and heterogeneous integration with MEMS/MOEMS devices on different substrate materials. The technology of diffractive and microoptical elements continues to advance and diversify in applications. The use of diffractive and microrefractive elements provides potential for significant benefits in the areas of performance improvement, size/weight reduction, and integration with electronic and mechanical devices. MEMS-based waveguide devices offer potential for realizing compact sensor devices. Technologies compatible with microelectronics and MEMS/MOEMS fabrication, and those that will lead to low-cost mass production are of special interest.

This conference provides a forum for technical presentations, exchange of viewpoints, and report on new techniques and fabrication methods, and devices and systems application developments all in microoptics and nanooptics. The topics for this conference include but are not limited to:
- fabrication methodologies based on binary, gray-scale, and interferometric methods
- non-lithographic methods such as soft-lithography, ink jet printing, and micromolding
- LIGA, SLIGA, LIGA-like related processes
- sol-gel processing methods for free-space and guided wave optics
- additive lithography in microoptics
- spin-on-glass process development
- direct-write laser-based methods including two-photon processes and three-dimensional processing methods
- lift-off processes for sub-micron patterning
- reactive ion etch (RIE) and chemically assisted etching of high-aspect structures in glass and semiconductor materials
- passive and/or active integration of microoptics into MEMS devices
- waveguide devices integrated into MEMS structures
- design and processing photonic crystal devices
- quality and metrology issues of microoptics fabrication and integration
- polymer replication and other mass production methods
- micro- and nanoscale devices and systems with microoptics
- microoptics for interconnect applications to MEMS/MOEMS
- sensor applications for photonic MEMS devices.

Call For Papers

MOEMS Display and Imaging Systems II (mfo7)

Conference Chairs: **Hakan Urey**, KOÇ Univ. (Turkey); **David L. Dickensheets**, Montana State Univ.

Program Committee: **F. Levent Degertekin**, Georgia Institute of Technology; **Masayoshi Esashi**, Tohoku Univ. (Japan); **Larry J. Hornbeck**, Texas Instruments Inc.; **Harald Schenk**, Fraunhofer-Institut für Photonische Mikrosysteme (Germany); **Olav Solgaard**, Stanford Univ.; **Gary K. Starkweather**, Microsoft Corp.; **Joseph J. Talghader**, Univ. of Minnesota; **Gleb V. Vdovin**, Technische Univ. Delft (Netherlands); **Ming C. Wu**, Univ. of California/Los Angeles

MOEMS devices and systems employ MEMS technology to sense or manipulate light by using refraction, reflection, or diffraction principles for the control of light intensity or phase, beam steering and beam shaping. MOEMS display and imaging systems are specifically concerned with the optical generation or sensing of spatial information in one, two or three-dimensions.

This conference provides a leading forum for discussing MOEMS display and imaging device concepts focusing on theory, design issues, new materials, device characterization and testing including reliability issues and applications. Original technical papers on the following topics are solicited:

- MOEMS display systems
- MOEMS imaging systems
- MOEMS scanners and scanned beam display and imaging devices
- micromirror arrays
- Digital Micromirror Device (DMD) applications in imaging and displays
- micromachined diffraction grating and interferometric displays and imaging devices
- micromachined microbolometer, pyroelectric, and other IR and thermal imaging sensors
- microoptical beam steering systems
- MOEMS spatial light modulators
- MOEMS aberration correction, adaptive optics, and visual aids
- MOEMS instruments for space exploration
- MOEMS for beam shaping and image improvement
- MEMS actuators and position sensors for display and imaging systems
- novel packaging, testing, materials, and characterization methods for MOEMS display and imaging systems
- MOEMS focus control devices
- micromachined ultrasonic imaging systems
- endoscopic imaging devices using MOEMS
- scanning confocal imaging devices using MOEMS
- 3D displays and 3D scanners
- MOEMS for enhanced imaging
- MOEMS devices in conventional imaging or display systems
- MOEMS optical elements for imaging or display systems: phase shifting devices, gratings, microlenses, microprisms, beam splitters, microshutters, polarizers, waveplates, filters, high reflection coatings, aperture.

General Information

SPIE's Event Project Manager for this symposium is Scott Walker. For information about the technical program, email: meetinginfo@spie.org.

Advance Technical Program

Available November 2003

The comprehensive Advance Technical Program for this symposium will list conferences, paper titles, and authors in order of presentation; an education program schedule, including course descriptions and instructor biographies; an outline of all planned special events; and information detailing the hotel reservations process. All those who submit an abstract will receive a copy, or contact SPIE to request a copy.

Registration

Registration fees for conferences and short courses and registration form, will be available in the Advance Technical Program.

Hotel Accommodations

Information concerning hotel reservations, as well as a hotel reservation form, will be included in the Advance Technical Program available in November 2003.

To find a list of budget priced housing for Photonics West 2004, please visit the SPIE Web site at www.spie.org/info/pw/. SPIE and the San Jose Convention Bureau do not imply any evaluation as to the quality of such housing. You will need to make your own determination as to suitability considering price and location. Each hotel will determine when they will accept reservations for this event.

Submission of Abstracts

Abstract Due Date: 16 June 2003 **Manuscript Due Date:** 3 November 2003

ALL DUE DATES MUST BE STRICTLY OBSERVED

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The International Society for Optical Engineering

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IMPORTANT!

Submissions imply the intent of at least one author to register, attend the symposium, present the paper (either orally or in poster format), and submit a full-length manuscript for publication in the conference Proceedings.

All authors (including invited or solicited speakers), program committee members, and session chairs are responsible for registering and paying the reduced author, session chair, program committee registration fee. (Current SPIE Members receive a discount on the registration fee.)

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IMPORTANT! To ensure proper processing of your abstract, the SUBJECT line must include only:

SUBJECT: Conf. Code

Your abstract submission must include all of the following:

1. **PAPER TITLE**
2. **AUTHORS** (principal author first) For each author: First (given) name (initials not acceptable), Last (family) name, Affiliation, Mailing address, Telephone, Fax, and Email address.
3. **PRESENTATION PREFERENCE** "Oral Presentation" or "Poster Presentation."
4. **PRINCIPAL AUTHOR'S BIOGRAPHY** Approximately 50 words.
5. **ABSTRACT TEXT** Approximately 250 words.
6. **KEYWORDS** Maximum of five keywords.
7. **ABSTRACT** Approximately 500 words.
   Submit two-page abstract consisting of one page (500 words) of text, and one page of supporting data (graphs, drawings, photos, etc.). The abstract should clearly and concisely describe the objective, approach, and results achieved by the research, and present a compelling case. Details should be provided on
   · motivation of this research
   · significant new accomplishments
   · comparison with previous work by author and others
   · impact of your results on the MEMS/MOEMS fields
   · 250 word summary (to be published in the Abstract Book)

Conditions of Acceptance

- Authors are expected to secure funding for registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations before submitting abstracts.
- Only original material should be submitted.
- Commercial papers, papers with no new research/development content, and papers where supporting data or a technical description cannot be given for proprietary reasons will not be accepted for presentation in this symposium.
- Abstracts should contain enough detail to clearly convey the approach and the results of the research.
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Review, Notification, Program Placement

- To ensure a high-quality conference, all abstracts and Proceedings manuscripts will be reviewed by the Conference Chair/Editor for technical merit and suitability of content. Conference Chair/Editors may require manuscript revision before approving publication, and reserve the right to reject for presentation or publication any paper that does not meet content or presentation expectations. SPIE's decision on whether to accept a presentation or publish a manuscript is final.
- Applicants will be notified of abstract acceptance by mail no later than 29 September 2003. Early notification of acceptance will be placed on SPIE Web the week of 22 September 2003 at www.spie.org/info/pw
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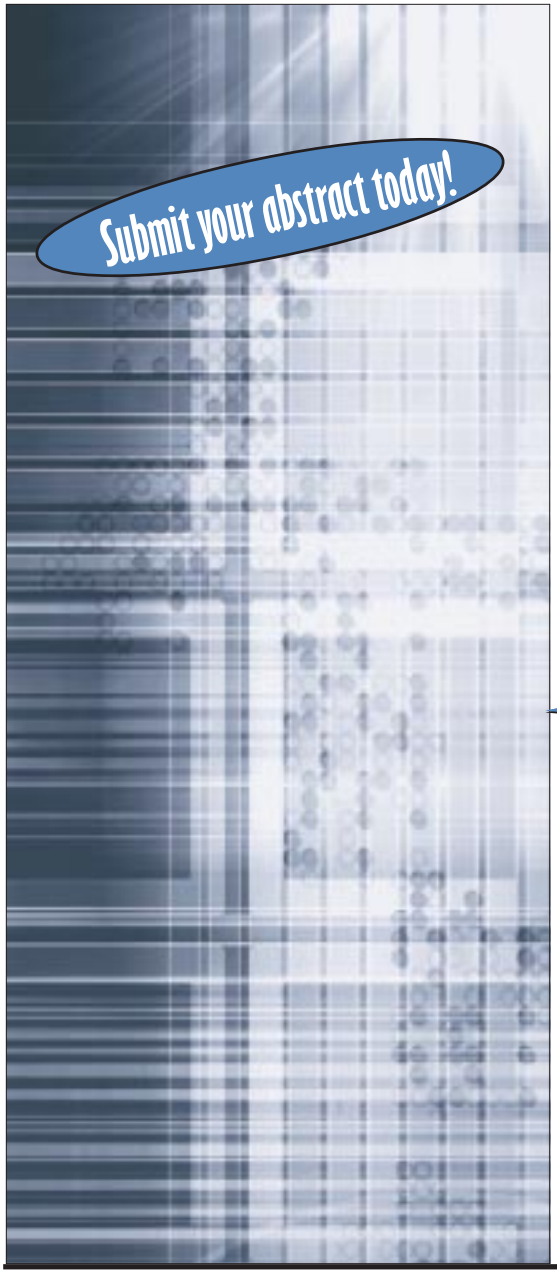

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