

Tenth Annual

MEMS Technology Symposium

Sensors: A Foundation for Accelerated MEMS Market Growth to \$1 Trillion

PARTICIPATING COMPANIES:

- AMKOR TECHNOLOGY
- BRIDGEWAVE COMMUNICATIONS
- COVENTOR, INC.
- FAIRCHILD SEMICONDUCTOR
- HEWLETT-PACKARD LABS
- HILLCREST LABORATORIES, INC.
- IHS ISUPPLY
- INTEL CORPORATION
- INVENSENSE, INC.
- KIONIX, INC.
- MANCEF
- MOVEA, INC.
- SENSOR PLATFORMS, INC.
- SYRIDE
- UNIVERSITY OF CALIFORNIA AT BERKELEY
- VECTORNAV TECHNOLOGIES
- WIRELESS COMMUNICATIONS ALLIANCE
- XSENS
- YOLE DÉVELOPPEMENT

Platinum Sponsor



Gold Sponsors



Association Sponsor



MAY 23, 2012 • SAN JOSE, CALIFORNIA

MEDIA SPONSORS



TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

CONTENTS

Agenda

Sponsor, Exhibitor, and MEMS for All of Us Participant Directories

Participant Biographies

MORNING KEYNOTE

- Sensory Swarms

Professor Kristofer Pister, University of California, Berkeley

- Accelerating MEMS Market to \$Trillion/Trillion Units

Janusz Bryzek, Ph.D., Fairchild Semiconductor

- Implementing the Trillion Dollar MEMS Roadmap

Robert Haak, Insight interAsia/MANCEF

- CeNSE: Awareness Through A Trillion MEMS Sensors

Rich Friedrich, Hewlett-Packard Labs

- On the Road to \$1T?

Gregory J. Galvin, Ph.D., Kionix, Inc.

- The MEMS Revolution: from Billions to Trillions?

J r mie Bouchaud, IHS iSuppli

AFTERNOON KEYNOTE

- Motion Interface the Next Large Market Opportunity

Steve Nasiri, InvenSense, Inc.

- Status of the MEMS Industry - New Drivers: The Path to New Opportunities

J. C. Eloy, Yole D veloppement

- Realizing the Full Potential of MEMS Design Automation

Stephen Breit, Ph.D., Coventor, Inc.

- High Volume Assembly & Test Solutions to Meet the Rapidly Growing MEMS Market

Russell Shumway, Amkor Technology

SPECIAL SESSION: MEMS for All of Us

- Fusing Sensors into Mobile Operating Systems and Innovative Use Cases

Tristan Joo, Wireless Communications Alliance

Participating Companies:

- Hillcrest Labs, Inc.
 - Movea, Inc.
 - Sensor Platforms, Inc.
 - Syride
 - VectorNav Technologies
 - Xsens
-

A ONE-DAY TECHNICAL SYMPOSIUM & EXHIBITS

Tenth Annual
MEMS TECHNOLOGY SYMPOSIUM
Sensors: A Foundation for Accelerated MEMS Market Growth to \$1 Trillion

MORNING AGENDA

7:00 am	Registration Opens
8:15 am	Welcome and Introduction
8:30 am - 9:00 am	MORNING KEYNOTE Sensory Swarms <i>Professor Kristofer Pister, Electrical Engineering and Computer Science University of California, Berkeley</i>
9:00 am - 9:30 am	Accelerating MEMS Market to \$Trillion/Trillion Units <i>Janusz Bryzek, Ph.D., VP MEMS Development Fairchild Semiconductor</i>
9:30 am - 10:00 am	Implementing the Trillion Dollar MEMS Roadmap <i>Robert Haak, CEO, Insight interAsia Pte Ltd. Vice President - Asia/Pacific, Executive Board of Directors, MANCEF</i>
10:00 am - 10:30 am	Morning Break and Exhibits
10:30 am - 11:00 am	CeNSE: Awareness through A Trillion MEMS Sensors <i>Rich Friedrich, Director of the CeNSE Program Hewlett-Packard Labs</i>
11:00 am - 11:30 am	On the Road to \$1T? <i>Gregory J. Galvin, Ph.D., President/CEO Kionix, Inc.</i>
11:30 am - 12:00 pm	The MEMS Revolution: from Billions to Trillions? <i>J�r�mie Bouchaud, Director and Senior Principal Analyst MEMS and Sensors IHS iSuppli</i>
12:00 pm - 1:00 pm	Lunch and Exhibits

Wednesday, May 23, 2012 • Holiday Inn San Jose • San Jose, California

A ONE-DAY TECHNICAL SYMPOSIUM & EXHIBITS

Tenth Annual
MEMS TECHNOLOGY SYMPOSIUM
Sensors: A Foundation for Accelerated MEMS Market Growth to \$1 Trillion

AFTERNOON AGENDA

1:00 pm - 1:30 pm	AFTERNOON KEYNOTE Motion Interface the Next Large Market Opportunity <i>Steve Nasiri, Founder, President, CEO and Chairman</i> <i>InvenSense, Inc.</i>
1:30 pm - 2:00 pm	Status of the MEMS Industry - New Drivers: The Path to New Opportunities <i>J.C. Eloy, President and CEO</i> <i>Yole Développement</i>
2:00 pm - 2:30 pm	Realizing the Full Potential of MEMS Design Automation <i>Stephen Breit, Ph.D., Vice President Engineering</i> <i>Coventor, Inc.</i>
2:30 pm - 3:00 pm	High Volume Assembly & Test Solutions to Meet the Rapidly Growing MEMS Market <i>Russell Shumway, Sr. Manager, MEMS & Sensor Packaging</i> <i>Amkor Technology</i>
3:00 pm - 3:30 pm	Afternoon Break and Exhibits
	SPECIAL SESSION: MEMS for All of Us <i>This special session will showcase products driven by sensors, sensor software, and the technology behind these products. During the reception following this session attendees will have an opportunity to see hands on demonstrations of the products.</i>
3:30 pm - 3:50 pm	Fusing Sensors into Mobile Operating Systems & Innovative Use Cases <i>Tristan Joo, Board Director & Co-Chair of Mobile SIG</i> <i>Wireless Communications Alliance</i> Participating Companies: <i>Hillcrest Labs, Inc.</i> <i>Movea, Inc.</i> <i>Sensor Platforms, Inc.</i> <i>Syride</i> <i>VectorNav Technologies</i> <i>Xsens</i>
5:00 pm - 7:00 pm	Exhibitor and Sponsor Reception and Demonstrations

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

A SPECIAL THANKS TO OUR SPONSORS

PLATINUM SPONSOR



GOLD SPONSORS



ASE GROUP

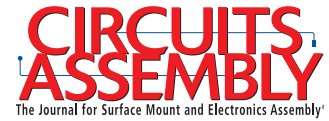
ASSOCIATION SPONSOR



Please see our sponsors' ads on the following pages.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

THANKS TO OUR MEDIA SPONSORS



Test, Assembly &
Packaging TIMES™



Kionix[®]
Sensing the Future



Value Beyond Silicon.

At Kionix, we don't simply offer accelerometers; we provide a range of solutions for Android, Windows, and embedded systems.

- Our solutions include high-performance consumer grade accelerometers, gyroscopes, and combo sensors.*
- We enable motion-based gaming, context awareness, user interface, personal navigation, remote control, notebook hard disk drive drop protection, and much more.*
- And now we're adding comprehensive software libraries for various inertial sensor combinations on the leading operating systems and hardware platforms.*

Contact us today to learn more about our solutions and how we can put them to work for you.

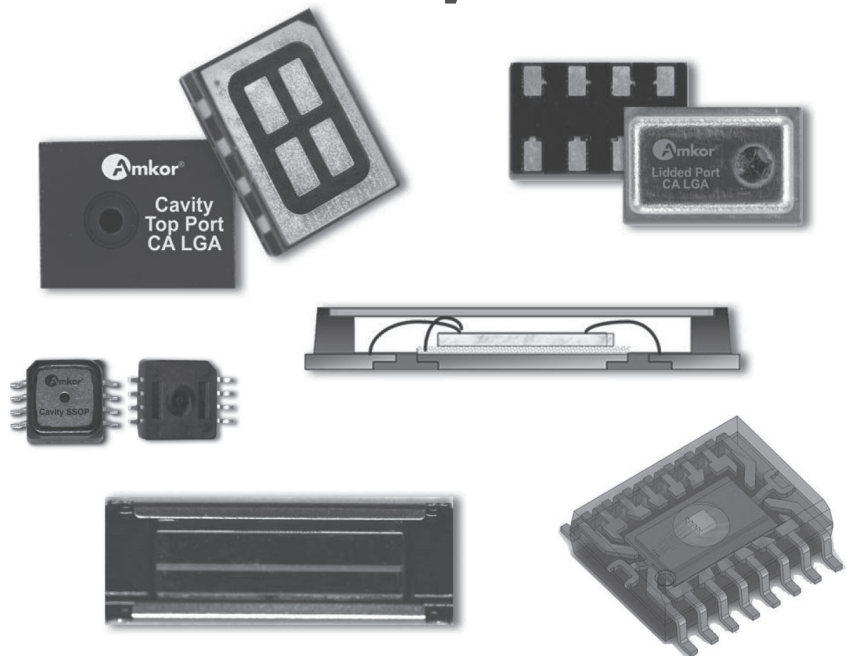
Amkor provides the building blocks for next generation packaging

Technology leader with over 20 years of high-volume turnkey production experience in MEMS/Sensors

- Focused package platforms for MEMS applications & market standardization
- Special needs and handling available on volume production lines for cost & scale efficiencies
- Mature supply base of specialty materials for sensor production
- Highly scalable test solutions available and defined through close customer collaboration



MEMS & Sensor Solutions in Assembly and Test



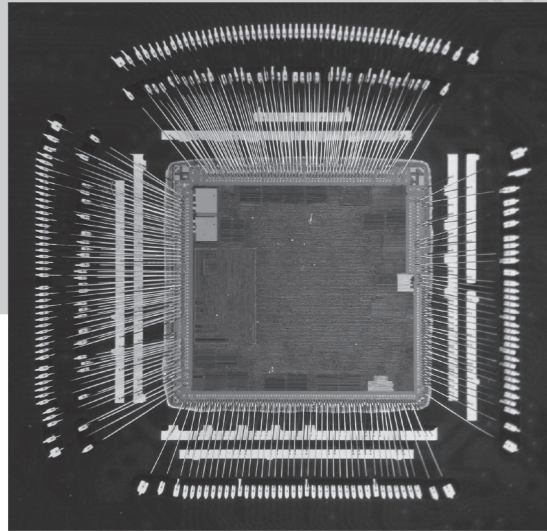
VISIT [AMKOR TECHNOLOGYONLINE](http://AMKORTECHNOLOGYONLINE) FOR LOCATIONS AND TO VIEW THE MOST CURRENT PRODUCT INFORMATION

www.amkor.com



ASE GROUP

Copper Wire



- ⌘ Cu wire bond as good as gold
- ⌘ Low cost opportunity
- ⌘ Wire diameters as low as 0.7 mils
- ⌘ Leader in high volume production
- ⌘ Quality and yield equivalent to gold
- ⌘ High reliability, typically 2x JEDEC



www.aseglobal.com

© ASE Group. All rights reserved.

MEMS JOURNAL

The Largest MEMS Publication in the World

- Founded in 2003
- 21,200+ subscribers
- Comprehensive MEMS news coverage
- 7-14 MEMS and microsystems stories every week
- MEMS webinars, whitepapers and presentations
- Interviews with MEMS industry leaders
- Latest MEMS patents and patent applications

For marketing and consulting services,
please contact Dr. Mike Pinelis at
mike@memsjournal.com.

For editorial inquiries,
please contact John Williamson at
jwilliamson@memsjournal.com.

MEMS JOURNAL, INC.

2000 Town Center, Suite 1900, Southfield, Michigan 48075

Phone: 734.277.3599 / Fax: 734.239.7409

<http://www.memsjournal.com>

<http://www.memsjournal.com/subscribe.htm>

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

EVENT SPONSORS

PLATINUM SPONSOR



Kionix, Inc.

36 Thornwood Drive, Ithaca, NY 14850
Phone: 607-257-1080

www.kionix.com

Kionix, Inc. is a global MEMS inertial sensor manufacturer, offering one of the industry's broadest families of tri-axis accelerometers and gyroscopes. Consumer-electronics leaders worldwide utilize Kionix's products, development tools and applications to enable motion-based gaming; context awareness, personal navigation, remote control and hard drive drop protection in mobile products.

GOLD SPONSORS



Amkor Technology

1900 S. Price Road, Chandler, AZ 85286
Phone: 480-821-5000

www.amkor.com

Amkor Technology, Inc. is one of the world's largest providers of advanced semiconductor assembly and test services. Founded in 1968, Amkor has become a strategic manufacturing partner for many of the world's leading semiconductor companies and electronics OEMs, providing a broad array of advanced package design, assembly and test solutions. Amkor's operational base encompasses more than 5 million square feet of manufacturing facilities, product development centers, and sales & support offices in Asia, Europe and the United States. Amkor offers a suite of services, including electroplated wafer bumping, probe, assembly and final test. Amkor is a leader in advanced copper pillar bump and packaging technologies which enables next generation flip chip interconnect.

ASSOCIATION SPONSOR



MEMS Industry Group

1620 Murray Avenue, 3rd Fl, Pittsburgh, PA 15217
Phone: 412-390-1644

www.memsindustrygroup.com

MEMS Industry Group (MIG) is the unifying voice of the commercial MEMS community, representing those companies with the goal of making money in the MEMS market. By providing forums for information exchange and collaboration they create the horizontal band across the broad range of companies supporting and utilizing MEMS technology. MIG is the virtual and physical place for people and organizations to come together to address industry issues and further the commercialization of MEMS.



ASE GROUP

ASE Group

1255 E. Arques Avenue, Sunnyvale, CA 94085
Phone: 408-636-9500

www.aseglobal.com

The ASE Group is the world's largest provider of independent semiconductor manufacturing services in assembly and test. As a global leader geared towards meeting the industry's ever growing needs for faster, smaller and higher performance chips, the Group develops and offers a wide portfolio of technology and solutions including IC test program design, front-end engineering test, wafer probe, wafer bump, substrate design and supply, wafer level package, flip chip, system-in-package, final test and electronic manufacturing services.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

EXHIBITOR DIRECTORY

Advanced Packaging Center

Stenograaf 3
6921EX, Duiven, The Netherlands
Phone: 480-488-9898

www.apcenter.nl

Advanced Package Center (APC), offers a one-stop shop for delivery of research, development, qualification, prototyping and small volume manufacturing services. APC focuses upon MEMS, Sensors, and advanced IC and wafer level packaging realized through Boschman Technologies' unique Film Assist Molding (FAM) technology. By working closely with customer R&D departments to explore new packaging concepts, APC provides value from Innovation to Industrialization.

AGC Electronics America

18694 Caminito Pasadero
San Diego, CA 92128
Phone: 714-745-3193

www.agcem.com

AGC, a Fortune Global 1000 company, is a leader in glass materials and related technologies. Their world class electronic packaging products include: AQ Fused silica; ideal for remarkable High Frequency Performance >20 GHz; EN-A1 Alkali Free Boro-Aluminosilicate; for IPD and interposer substrates and Specialty glass frits/paste provide solutions for MEMS bonding, high frequency, and PV and LED applications.

Amkor Technology

1900 S. Price Road
Chandler, AZ 85286
Phone: 480-821-5000

www.amkor.com

Amkor Technology, Inc. is one of the world's largest providers of advanced semiconductor assembly and test services. Founded in 1968, Amkor has become a strategic manufacturing partner for many of the world's leading semiconductor companies and electronics OEMs, providing a broad array of advanced package design, assembly and test solutions. Amkor's operational base encompasses more than 5 million square feet of manufacturing facilities, product development centers, and sales & support offices in Asia, Europe and the United States. Amkor offers a suite of services, including

electroplated wafer bumping, probe, assembly and final test. Amkor is a leader in advanced copper pillar bump and packaging technologies which enables next generation flip chip interconnect.

AmTECH Microelectronics

6541 Via Del Oro
San Jose, CA 95119
Phone: 408-227-8885

www.amtechmicro.com

AmTECH is a community of talented and experienced employees with a reputation for excellent service, on-time delivery and a strong commitment to quality. AmTECH was founded on 1993 to provide Advanced Packaging and PCB Assembly. They provide manufacturing services for IC Packaging, Chip-On-Board, Chip-On-Flex, MEMS and Multichip Modules with Fine Pitch Gold or Aluminum Wire Bonding. Their PCB Assembly capabilities include Lead-Free SMT Assembly with 0201, μ BGA; WLCSP and 0.4mm pitch QFNs and connectors.

ASE Group

1255 E. Arques Avenue
Sunnyvale, CA 94085
Phone: 408-636-9500

www.aseglobal.com

The ASE Group is the world's largest provider of independent semiconductor manufacturing services in assembly and test. As a global leader geared towards meeting the industry's ever growing needs for faster, smaller and higher performance chips, the Group develops and offers a wide portfolio of technology and solutions including IC test program design, front-end engineering test, wafer probe, wafer bump, substrate design and supply, wafer level package, flip chip, system-in-package, final test and electronic manufacturing services.

Boschman Technologies

Stenograaf 3
6921EX, Duiven, The Netherlands
Phone: 480-488-9898

www.boschman.nl

Boschman Technologies is the world's leading supplier of automatic molding systems using Film Assisted Molding (FAM) technology. QFN, SENSOR, MEMS, Solar and other unique applications like Bio-Sensors

where bond pads, heat sinks, window or exposed die surfaces must be kept free of mold compound or resin bleed are ideally suited for their cost effective technology. As the holder of many FAM related patents, Boschman brings unique and proven solutions. In addition Boschman provides automatic molding solutions for conventional semiconductor devices and reel to reel smartcards.

Coventor, Inc.

4000 CentreGreen Way, Suite 190
Cary, NC 27513
Phone: 919-854-7500

www.coventor.com

Coventor, Inc. is the market leader in automated design solutions for micro-electromechanical systems (MEMS) and virtual fabrication of MEMS and semiconductor devices. Coventor serves a worldwide customer base of integrated device manufacturers, fabless design houses, independent foundries, and R&D organizations that develop MEMS-based products for automotive, aerospace, industrial, defense, and consumer electronics applications, including smart phones, tablets, and gaming systems. Coventor's software tools and expertise enable its customers to simulate and optimize MEMS device designs and fabrication processes before committing to time-consuming and costly build-and-test cycles. The company is headquartered in Cary, North Carolina and has offices in Silicon Valley, Calif., Cambridge, Mass., and Paris.

E-tec Interconnect Ltd.

P.O. Box 4078
Mountain View, CA 94040
Phone: 408-746-2800

www.e-tec.com

E-tec Interconnect is an established supplier of precision sockets and contactors for MEMS development and test applications. Custom requirements are welcome: they can accommodate virtually any footprint including "mixed pitch" and "non-Jedec" modules. Top and bottom openings can be modified to satisfy a variety test set-ups including open cavity probe and thermal emission microscopy. Standard features include: pin pitch from 0.3mm through 1.5 mm, pin counts up to 2000 and test speeds to 40 GHz. SMT, thru-hole and solderless mount options are available as well as various clo-

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

EXHIBITOR DIRECTORY

sure styles. Their socket products are engineered and manufactured by Swiss craftsmen, they are competitively priced and expedited delivery is available.

FRT of America

1101 S. Winchester Blvd., L-240
San Jose, CA 95128
Phone: 408-261-2632

www.frtofamerica.com

FRT is recognized as a valued partner for non-contact, optical metrology systems. FRT of America serves you by providing high quality automated measuring tools which fulfill your research, inspection and process verification needs. Delivering increased manufacturing yield, enhanced productivity, improved quality and product performance, because that's what it's about at the end of the day. The MicroProf measures step height, shape, thickness, roughness and more; their MicroProf TTV measures wafer thickness, TTV, bow and warp for full thickness, thinned and bonded wafers and their MicroSpy Topo DT is a high resolution 3D profiler with confocal and interferometric measuring modes.

Gel-Pak

31398 Huntwood Avenue
Hayward, California 94544
Phone: 888-621-4147 / 510-576-2220

www.gelpak.com

Gel-Pak manufactures Gel-Coated boxes, trays, slides and films that are designed to protect sensitive devices during transport and processing. The company's proprietary elastomer technology holds devices in place without the use of custom molded pockets. The systems are distributed worldwide.

InvenSense, Inc.

1197 Borregas Avenue
Sunnyvale, CA 94089
Phone: 408-988-7339

www.invensense.com

InvenSense Inc. (NYSE: INVN) is the leading provider of MotionTracking™ solutions for consumer electronic devices in the world. The company's pat-

ented Nasiri-Fabrication platform and patent-pending MotionFusion™ technology address the emerging needs of many mass-market consumer applications such as improved performance, accuracy, and intuitive motion and gesture based interfaces. InvenSense technology can be found in consumer electronic markets including smartphones, tablets, gaming devices, optical image stabilization, and remote controls for Smart TVs. InvenSense is headquartered in Sunnyvale, California and has offices in China, Taiwan, Korea, Japan, and Dubai.

Kionix, Inc.

36 Thornwood Drive
Ithaca, NY 14850
Phone: 607-257-1080

www.kionix.com

Kionix, Inc. is a global MEMS inertial sensor manufacturer, offering one of the industry's broadest families of tri-axis accelerometers and gyroscopes. Consumer-electronics leaders worldwide utilize Kionix's products, development tools and applications to enable motion-based gaming; context awareness, personal navigation, remote control and hard drive drop protection in mobile products.

Lam Research Corporation

4300 Cushing Parkway
Fremont, CA 94538
Phone: 510-572-0200

www.lamrc.com

Lam Research Corporation is a leading supplier of wafer fabrication equipment and services to the worldwide semiconductor industry, where they have been advancing semiconductor manufacturing for over 30 years. Their market-leading etch products address a broad range of applications, from conductor and dielectric etch to emerging MEMS, deep silicon, and 3D IC applications. Lam's clean portfolio incorporates both wet and plasma-based technologies, allowing implementation of customized yield-enhancing solutions. With their expertise and world-class global customer support, Lam Research is addressing many of today's most advanced semiconductor processing challenges.

MEMS Industry Group

1620 Murray Avenue, 3rd Floor
Pittsburgh, PA 15217
Phone: 412-390-1644

www.memindustrygroup.com

MEMS Industry Group (MIG) is the unifying voice of the commercial MEMS community, representing those companies with the goal of making money in the MEMS market. By providing forums for information exchange and collaboration they create the horizontal band across the broad range of companies supporting and utilizing MEMS technology. MIG is the virtual and physical place for people and organizations to come together to address industry issues and further the commercialization of MEMS.

memsstar

Starlaw Park, Starlaw Road
Livingston EH54-8SF, United Kingdom
Phone: +44 1506 409160

www.memsstar.com

memsstar is a leading provider of etch and deposition equipment and process expertise to the micro-electrical mechanical systems (MEMS) and semiconductor industries. The company's vapor release and anti-stiction processes offer high performance processing solutions for tomorrow's MEMS devices. All wafer processing is performed on a single wafer basis, and tool configurations range from a manual, one-chamber R&D system to a fully automated cluster tool for high volume production. As well as its XeF2 and HF isotropic etch processes, memsstar also offers a coatings chamber for the deposition of self assembled monolayers (SAM).

Micrel, Inc.

2180 Fortune Drive
San Jose, CA 95131
Phone: 408-944-0800

www.micrel.com

Micrel, Inc. is a leading manufacturer of IC solutions. Micrel's Custom Foundry Services allow customers to develop proprietary process flows, from R&D to high-volume production. Products include mixed-signal, analog, and power semiconductors, communication, clock management,

(continued)

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

EXHIBITOR DIRECTORY

Ethernet switch, and physical layer transceivers. Headquarters and state-of-the-art wafer fabrication facilities are in San Jose, CA, with offices and design centers globally.

MicroGen Systems, Inc.

95 Brown Road, Suite 120
Ithaca, NY 14850
Phone: 585-683-1430

www.microgensystems.com

MicroGen Systems, Inc. delivers the first MEMS based vibrational energy harvesters based on patented technology and intended to power autonomous and networked wireless sensors. Markets include industrial (process and manufacturing monitoring) and commercial (appliances), automotive, infrastructure and consumer. MicroGen has begun volume production for its first family of products MEMS. Initial markets are industrial and commercial. MicroGen Systems, powering the wireless world.

Microplex, Inc.

1070 Ortega Way
Placentia, CA 92870
Phone: 714-630-8220

www.microplexinc.com

Microplex hole fill for silicon wafers (TSV) has a higher aspect ratio than plated copper hole plugs. The copper fill is sintered at 850°C and has a TCE that is better matched to silicon than that of plated copper. Their copper fill does not generate the stresses of plated copper hole plugs resulting in a more reliable product. Microplex also has the capability to make circuits with 25 micron lines, 25 micron spaces, and 25 micron interconnects (hole fill) on 250 micron thick ceramic. The pattern is etched and the resolution is comparable to that of thin film circuits. The gold conductors can be etched thick film or Printed Thin Film (PTF). Their printed thin film can be plated with nickel and gold to allow soldering and wire bonding.

Milestone Technology

1292 Kifer Road, Suite 810
Sunnyvale, CA 94086
Phone: 408-530-8378

www.milestonefab.com

Milestone Technology is a Failure Analysis Lab providing services for the MEMS, Semiconductor, LED, Medical Device, Solar, Electronics, Disk Drive, Optical, Coating, Ceramics and Materials industries. They specialize in Ultra High Resolution SEM, EDX, Quantitative Analysis, Mapping, Precision Cross-Sectioning, Surface Contamination, FTIR, PCB Inspection, Dye Pry, and Metallography.

Pac Tech USA Packaging Technologies Inc.

328 Martin Avenue
Santa Clara, CA 95050
Phone: 408-588-1925

www.pactech-usa.com

Pac-Tech USA Packaging Technologies Inc. facility in Santa Clara, California offers contract wafer bumping services using low cost electroless Ni/Au under-bump metallization, solder stencil printing and solder ball placement for quick-turn and mass-production. PacTech USA also provides product demonstrations, training and sales support. Pac Tech designs and builds state-of-the-art wafer bumping and assembly equipment for flip-chip and chip-scale packaging. Pac Tech is the worldwide leader in laser reflow and heating technology as implemented in systems for solder jetting (SB2) and flip-chip attach (LAPLACE) for advanced packaging applications like HGA assembly, MEMS and optoelectronic packaging, LCD driver assembly, etc.

Palomar Technologies

2728 Loker Avenue West
Carlsbad, CA 92010
Phone: 760-931-3600

www.palomartech.com

Palomar Technologies, a former subsidiary of Hughes Aircraft, is the global leader of automated high-accuracy, large work area die attach and wire bond equipment and precision contract assembly services. Customers utilize the products, services and solutions from Palomar Technologies

to meet their needs for optoelectronic packaging, complex hybrid assembly and micron-level component attachment. Assembly Services, located in Carlsbad, CA, is the contract assembly, process development, test and prototyping division of Palomar Technologies. Assembly Services provides process expertise with high-precision die attach, wire bond and component placement services, offering its customers an alternative route to meet complex packaging needs for without investing in capital equipment.

Polytec, Inc.

16400 Bake Parkway
Irvine, CA 92618
Phone: 949-943-3033

www.polytec.com

Polytec is a world leader in optical measurement systems, featuring the state-of-the-art Micro System Analyzer (MSA-500) system for MEMS characterization. The MSA system incorporates three key technologies: scanning laser Doppler vibrometry for out-of-plane deflection shape, strobe video microscopy for in-plane motion and white light interferometry for static shape measurements. Their instruments are used throughout the MEMS research community.

PROMEX Industries, Inc.

3075 Oakmead Village Drive
Santa Clara, CA 95051
Phone: 408-496-0222

www.promex-ind.com

PROMEX, Silicon Valley's Packaging Foundry, integrates IC Assembly, materials-centric Advanced Packaging with broad process and technical knowledge, enabling customers to take new products to market faster than by any other route. Chip-on-Board and High Reliability SMT are also available. JEDEC standard, custom and open cavity plastic molded QFN's. Promex is a recognized leader in 2D, 2.5D, 3D and RoHS compliant Advanced Packaging including SiPs, MEMS, Medical Devices, Image Sensors & RF modules. ISO 9001, ISO 13485 Medical registered, ITAR certified. Worldwide customers are provided quick turns, process development, prototypes through NPI, coupled to scalable volume production in our partnership centered culture.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

EXHIBITOR DIRECTORY

Quartet Mechanics

1040 Di Giulio Avenue, Suite 200
Santa Clara, CA 95050
Phone: 408-200-8345

www.quartetmechanics.com

Based in the Silicon Valley, California, Quartet Mechanics has core technology that lies in the areas of micron-level precision material handling, machine vision systems, advanced clean-room robotics and custom automation. Their product suite features standard or custom tool development, robotics and peripherals, high precision component tooling/fabrication, and tool connectivity/e-diagnostics. All their components are designed with module and versatile concept, so a single tool can bridge various substrate materials, sizes, shapes, process steps with no or limited change-over. High through-put 4-axis SCARA robots with machine vision are used for alignment & placement for your micro manufacturing. Regardless of wafer thickness, from 50 µm thin wafers to 6mm bonded wafers, or perforated, warped, bumped, and over-sized carrier wafers, their wafer transfer automation solution provides the precision and repeatability tolerance required by the MEMS industry.

Quik-Pak

10987 Via Frontera
San Diego, CA 92127
Phone: 858-674-4676

www.icproto.com

Quik-Pak, a division of Delphon Industries, provides IC packaging and assembly services. The company's newest offering is its OmPP package. These pre-molded QFN packages provide a fast, inexpensive solution for your prototype or sample requirements. Quik-Pak also specializes in a variety of services that together provide a full turn-key solution including wafer preparation, die/wire bonding, remolding and marking/branding. Custom assembly services are also offered for Flip Chip, Ceramic Packages, Chip-on-Board, Stacked Die, MEMS, etc.

Silex Microsystems

580 California Street, Suite 1200
San Francisco, CA 94104
Phone: 415-283-3399

www.silexmicrosystems.com

Silex Microsystems is a world-leading MEMS foundry that brings advanced process technologies and manufacturing capacity to a wide range of high-tech companies. Currently Silex operates two state-of-the-art MEMS fabs with 6" and 8" wafer size respectively. They serve customers in a wide range of application areas, such as automotive, medical, consumer electronics and more. Among the sensors manufactured are pressure sensors, accelerometers, gyros and also components for flow control, ink jet printing and drug delivery. Silex is also well recognized for its world leading through wafer via processes (Sil-Via® and Met-VIA®) that enables wafer level packaging of MEMS and CMOS using the extended process modules Sil-CAP™ and Met-CAP™.

SoftMEMS

2391 Nobili Avenue
Santa Clara, CA 95051
Phone: 408-426-4301

www.softmems.com

SoftMEMS is the creator of the popular, powerful, easy-to-use CAD tool suites MEMS Pro, MEMS Master and MEMS Explorer. Software functionalities encompass mixed MEMS/IC schematic capture, simulation, optimization, statistical analysis, full custom mask layout, manufacturing rule verification, 3D model generation and visualization from manufacturing process descriptions, behavioral model creation and links to 3D analysis packages.

sp3 Diamond Technologies, Inc.

1605 Wyatt Drive
Santa Clara, CA 95054
Phone: 408-492-0630

www.sp3diamondtech.com

Founded in 1993 and headquartered in Santa Clara, California, USA, sp3 Diamond Technologies makes chemical vapor deposition (CVD) diamond for a broad range of applications where current materials have reached their limit. sp3 provides thick-

film and thin-film diamond products for advanced thermal management and cutting tool applications, CVD diamond coating and material services, hot filament CVD reactor systems and diamond deposition consulting services.

STPKC

Academic City
Dubai / UAE 300109
Phone: +971 56 729 1679

www.stpkc.com

Semiconductor Technology Package Consulting (STPKC) is a fabless design centre for packages and modules. Due to increased challenges in packaging, STPKC helps customers to co-design packages for MEMS and IC applications. They work hand in hand with their customers from concept to Design for Manufacturing (DFM).

SVTC Technologies, LLC

3833 North First
San Jose, CA 95134
Phone: 408-240-7000

www.svtc.com

SVTC Technologies provides development and commercialization services for innovative semiconductor process-based technologies and products, cost-effectively and in an IP-secure manner. Through facilities in San Jose, California, and Austin, Texas, SVTC serves customers in rapidly growing markets such as novel memory, novel transistors, logic, MEMS, biotechnology, image sensors and photovoltaics. SVTC offers a suite of leading-edge equipment and services, including full-scale 8-inch and 12-inch process capabilities, advanced CMOS and non-CMOS equipment, analytical services, development support tools and commercialization services. SVTC is ISO 9001 and ITAR certified. SVTC's investors include Oak Hill Capital Partners, Tallwood Venture Capital and the company's management and employees.

(continued)

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

EXHIBITOR DIRECTORY

Tousimis

2211 Lewis Avenue
Rockville, CA 20851
Phone: 301-881-2450

www.tousimis.com

Tousimis manufactures highly reliable Supercritical CO₂ Dryers which enable delicate micro 3-D structural preservation. Their Critical Point Dryer (CPD) process technology eliminates surface tension forces. Current CPD applications include MEMS, Bio-MEMS, AeroGel, Nano Particle, Carbon Nanotube, Graphene and others. Tousimis is a USA based company located in the Washington D.C. area. Tousimis supports all products with their global sales and service support network.

Unisem Group

1284 Forgewood Avenue
Sunnyvale, CA 94089
Phone: 408-734-3222

www.unisemgroup.com

Unisem Group is a global provider of semiconductor assembly and test services for many of the world's most successful electronics companies. Unisem offers an integrated suite of packaging and test services such as wafer bumping, wafer probing, wafer grinding, a wide range of lead-frame and substrate IC packaging including leaded, QFN, BGA and FlipChip packages, and high-end RF and mix-signal test services. The company's turnkey services include design, assembly, test, failure analysis, and electrical and thermal characterization. With approximately 10,000 employees worldwide, Unisem has factory locations in Ipoh, Malaysia; Wales, United Kingdom; Chengdu, People's Republic of China; Batam, Indonesia and Sunnyvale, California, USA. The company is headquartered in Kuala Lumpur, Malaysia.

XACTIX, Inc.

2403 Sidney Street, Suite 300
Pittsburgh, PA 15203
Phone: 412-381-3195

www.xactix.com

XACTIX is the manufacturer of the Xetch[®] xenon difluoride (XeF₂) etching systems with many different models to support small labs through high volume production. These dry isotropic etching tools are used to etch silicon, molybdenum and germanium and are popular in the MEMS community due to high selectivity versus many standard films including photoresist, silicon dioxide, silicon nitride, and aluminum. The Xetch[®] systems are particularly well suited for release, but are certainly not limited to MEMS applications and are useful for many applications where highly selective isotropic silicon, molybdenum and germanium etching is required. XACTIX also provides XeF₂ etching services.

Yole Développement

Le Quartz, 75 cours Emile Zola
69100 Lyon-Villeurbanne, France
Phone: +33-472-83-01-80

www.yole.fr

Beginning in 1998 with Yole Développement, they have grown to become a group of companies providing market research, technology analysis, strategy consulting, media in addition to finance services. With a solid focus on emerging applications using silicon and/or micro manufacturing, Yole Développement group has expanded to include more than 50 associates worldwide covering MEMS, MedTech, advanced packaging, compound Semiconductors, power Electronics, IED, and photovoltaics. The group supports companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

MEMS FOR ALL OF US PARTICIPANTS



Hillcrest Laboratories, Inc.

15245 Shady Grove Rd, S-400, Rockville, MD 20850
Phone: 240-386-0600

www.hillcrestlabs.com

Hillcrest Labs is a leading global supplier of motion processing solutions. These solutions capture human and mechanical movement and translate it into motion patterns which can be used to control and interact with devices. With more than a decade of MEMS experience, a unique perspective on the natural user experience, a global patent portfolio and numerous successful mass market deployments, they enable partners to quickly and effectively enhance and differentiate products through motion. Hillcrest offers both software and hardware solutions for creating motion enabled products, and has customers and licensees throughout Smart TV, Mobile Device, Gaming and Industrial sectors.



movea
motion is life

Movea, Inc.

6160 Stoneridge Mall Rd, Pleasanton, CA, 94588
Phone: 925-271-7470

www.movea.com

Movea is the leading provider of motion-processing technologies including software, embeddable solutions, and semiconductor IP for motion-enabled application development. Movea's unique motion-processing capabilities enable their customers to quickly add motion intelligence to their products. Through their easy-to-integrate technologies, Movea clients can reduce their risk, cost, and time-to-market to deliver compelling motion-based features that set their products apart from the competition and create more end-user value.



Sensor Platforms, Inc.

2860 Zanker Road, Suite 210, San Jose, CA 95134
Phone: 408-850-9350

www.sensorplatforms.com

Sensor Platforms is a venture-financed company located in Silicon Valley that licenses algorithmic software and platforms, enabling mobile consumer applications to better serve the users. The company's FreeMotion™ Library provides the sophisticated intelligence needed to process data from various sensors in smartphones and tablets, to interpret users' movements, situations and, inferentially, intents. The library allows device OEMs to purchase sensors from multiple suppliers, and optimizes power consumption to enable longer battery life. To achieve these benefits Sensor Platforms has assembled a team with expertise in control systems, machine learning, mixed signal design, motion kinematics, semiconductor device physics, and signal processing.



Syride

37 Anita Avenue, La Selva, CA 95076
Phone: 831-345-5969

www.syride.com

Syride created a lightweight (110g) and profiled (12.5 x 12.5 x 2cm) device which is the culmination of five years of research dedicated to the growing needs of extreme sports athletes (surfers, paragliders, etc.) wishing to conduct detailed monitoring of their practice to progress better and faster, and the ability to share and relive their experience.



VectorNav Technologies

903 N. Bowser Rd., S-200, Richardson, TX 75081
Phone: 512-772-3615

www.vectornav.com

VectorNav Technologies specializes in manufacturing high performance inertial measurement units and orientation sensors using the latest miniature solid-state MEMS inertial sensor technology. Since its founding by five graduates of Texas A&M University in 2008, VectorNav has been providing customers worldwide access to high quality, fully calibrated orientation sensors with state-of-the-art digital filtering technology. With a strong background in Aerospace Engineering and experience in the development and testing of spacecraft, launch vehicles, and micro-aerial vehicles, VectorNav brings high performance Aerospace filtering and calibration techniques into the world of low-cost industrial grade MEMS sensors, expanding the possibilities of today's MEMS sensor technology.



xsens

Xsens

Pantheon 6a, 7521 PR, Enschede, The Netherlands
Phone: +31 (0)88 97367 00

www.xsens.com

Xsens is the leading innovator in 3D motion tracking technology and products. Its sensor fusion technologies enable a seamless interface between the digital and physical world in consumer electronics devices and professional applications such as 3D character animation, motion analysis, and industrial control & stabilization. Clients and partners include Electronic Arts, NBC Universal, Daimler, Autodesk, Sagem (Safran Group), Siemens and other leading institutes and companies throughout the world. Founded in 2000, Xsens is a privately held company with headquarters in Enschede, the Netherlands and a US subsidiary in Los Angeles, California.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM**MORNING KEYNOTE**

SENSORY SWARMS**Professor Kristofer Pister***Electrical Engineering and Computer Science
University of California, Berkeley*

Reliable, low-power wireless sensor networking will bring an explosion in the demand for MEMS sensors. By reducing the cost of installation by an order of magnitude, wireless networking allows sensors to be used in new applications where they were previously impractical. For five years wireless networked sensors have been improving efficiency in industrial process automation, with multi-vendor interoperable systems deployed in over 100 countries, and revolutionizing the industry. With the introduction of efficient coding for Internet Protocol packets, each sensor can now have its own IPv6 address and communicate to cloud-based business logic and applications, setting the stage for similar revolutions in building automation, urban infrastructure, smart grid and energy efficiency, and countless other applications.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

ACCELERATING MEMS MARKET TO \$TRILLION/TRILLION UNITS

Janusz Bryzek, Ph.D.
VP MEMS Development
Fairchild Semiconductor

This presentation introduces a bold vision: potential for MEMS market to reach \$1 trillion dollars in the next ten years. Several discussed pointers confirm a potential for such growth. Clearly, the MEMS market is entering an explosive growth phase. Various analysts have estimated a growth of 12-15% per year from \$1.5B base in 2012, translating to a MEMS market of ~\$1 trillion in 35 years (2046). To reach that market in only 10 years, growth would have to be accelerated to 56% a year.

Acceleration of growth will require significantly faster MEMS R&D and commercialization cycles. Acceleration of R&D cycles will need new software tools enabling dramatically better process modeling. Acceleration of commercialization cycles will require standard MEMS processes.

This presentation will discuss different pointers to accelerated MEMS market growth and the impact of such growth.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

IMPLEMENTING THE TRILLION DOLLAR MEMS ROADMAP

Robert Haak

CEO, Insight interAsia Pte Ltd.

Vice President - Asia/Pacific, Executive Board of Directors, MANCEF

The rationale for this roadmap is a bold initiative to break from current MEMS sales growth patterns and leap to a new factor of improvement in MEMS sales. This would move the industry from a current hyper competition environment to one more of co-opetition.

This presentation will propose a three-part technology roadmap that requires the interface of at least three elements of the systems: (1) the sensor technology itself, (2) the technology of data transfer from the sensor, and (3) the technology behind the equipment used to process the data.

This roadmap is a market goal generated roadmap effort. Cooper (1994) was one of the first roadmapping professionals to focus on the market-generated roadmaps initiated in the late 1990's. New market goal roadmap efforts look toward market drivers that could generate the need for their products as the top strata of their roadmaps. The base proposition of this roadmap is the need for ubiquitous sensing. Social media will be used to develop drivers but two candidate examples of markets with needs are (1) highway infrastructure and (2) preventative medicine sensing.

With highway infrastructure, for example, much of today's US highway infrastructure was built during the Eisenhower administration to meet 50-year lifetime conditions. Today, the average bridge in that infrastructure is 48 years old and the average bridge costs approximately \$17,000 to inspect annually. Micro- and nano-sensors are key elements in this the sensing network and California is a lead user.

Roadmaps must have a timeline in order to be useful to anyone. The usual roadmap timeline starts at present day and progresses to a review in 5 years, then finalizes at 15 years. We do not see a reason to change this.

We must sequence the three roadmaps to meet the requirements of a system that would enable the growth sensor sales that we aim for. The approved candidate sensors will be used as the product platforms in the roadmap for sensors.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

CENSE: AWARENESS THROUGH A TRILLION MEMS SENSORS

Rich Friedrich

*Director of the CeNSE Program
Hewlett-Packard Labs*

Central Nervous System for the Earth (CeNSE) is a project involving multiple Hewlett-Packard groups focused on enabling a sensory system consisting of a trillion micro and nanoscale sensors embedded in the environment. CeNSE will provide real-time monitoring of surroundings for mission-critical business, environmental, health, and safety applications such as large structure integrity, medical monitoring, food safety, and energy use. By harvesting vast amounts of data and analyzing it to find correlations in space and time, we will enable customers to optimize their operations, anticipate their needs, and understand their impact. At the extremities of this system, HP is developing sensors with sensitivities that approach the limits of what is physically detectable. CeNSE will accelerate the growth rates of MEMS markets as the platform matures and the demand for deployed sensors reaches new applications. The enhanced awareness provided by CeNSE will revolutionize how we interact with the planet, technology, and each other.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

ON THE ROAD TO \$1T?

Gregory J. Galvin, Ph.D.
President/CEO
Kionix, Inc.

MEMS is certainly among the fastest growing markets in the world. However, the confluence of mobility, inter-connectivity and self-awareness suggests that the future of MEMS could be significantly brighter than even the most optimistic current forecasts. Recent years have seen a very rapid proliferation of MEMS devices, both sensors and actuators, entering large volume commercial applications. In less than a decade, MEMS microphones will have grown from zero units to annual production in the multiple billions. MEMS oscillators today are less than one percent of that multiple billion dollar market, yet could potentially show the same accelerated and disruptive growth as happened with MEMS microphones.

Several societal trends suggest the possibility of even more remarkable growth for the MEMS industry. First is mobility. Our electronic products have become ever more mobile, personal and indispensable. Second is inter-connectivity. Our electronic products are all interconnected, with each other and with the rest of the world. Information can be gathered anywhere and shared everywhere. Finally, our electronic products are becoming self-aware. They know where they are, what they are doing, what is happening around them and they can take appropriate actions on their own - all to the benefit of their users. MEMS devices, and an ever growing number of them, are integral to enabling these three trends.

This presentation will discuss the high-volume MEMS programs at Kionix, one of the leading suppliers of MEMS inertial sensors, and look at the potential for MEMS markets to reach the trillion dollar threshold over the next decade.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

THE MEMS REVOLUTION: FROM BILLIONS TO TRILLIONS?

J r mie Bouchaud

*Director and Senior Principal Analyst MEMS and Sensors
IHS iSuppli*

This presentation will provide feedback on the trillion-dollar market opportunity as envisioned in the Micro and Nanotechnology Commercialization Education Foundation (MANCEF) roadmap.

MEMS is definitely in the era of billions today. The market will be bolstered at a rate of \$1 billion per year in value over the next 5 years. Some companies shipped close to one billion units MEMS last year e.g. Knowles and ST. However, IHS iSuppli struggles with the vision of a \$Trillion MEMS market, even in 20 years' time. The presentation will explain why, referring to certain "pointers to accelerated MEMS market growth" of the roadmap to a \$Trillion MEMS market.

One must keep in mind that the market is highly price elastic. Even if, with a lot of imagination, the market expands to trillions of sensors in a few decades, this would only happen if these devices cost not \$10, not even \$1, but just a few cents. 12-bit accelerometers are already shipping for less than \$0.35 today and even at this price, they are still in the low billion range. The same applies to microphones, which sell for less for \$0.25 today. It means that a trillion units MEMS market would only generate a value in the \$10s of billion range. IHS iSuppli believes that to be realized, this vision of the trillion sensors market must be extended far beyond MEMS, to non-MEMS sensors that are more relevant for the "Internet of things", e.g. environmental sensors like temperature, light, humidity, UV, etc, and to non-MEMS sensor fabrication technologies that are more likely to reach the sub \$0.05 points needed for opening up trillions of units market, like large area plastic electronics.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM**AFTERNOON KEYNOTE**

MOTION INTERFACE THE NEXT LARGE MARKET OPPORTUNITY**Steve Nasiri***Founder, President, CEO and Chairman
InvenSense*

Every now and then, some new technology surfaces as the next Must-Have function that transforms the consumer products landscape; Bluetooth, Camera Modules, WiFi, and Touch Screens, to name just a few. Motion Interface rapidly has become that next Must-Have function in all mobile consumer products. At the outset within the Nintendo Wii and now found in all high-end Smart Phones and Tablets, and expected to be penetrating many other consumer products, such as, Smart TV's remote controllers, Wearable Devices, Ski Goggles, Power Screwdrivers, Golf Putters, Sporting Shoes, Quad-helicopters, and many more. This presentation will discuss the key fundamental technologies, challenges, benefits, and overview of various use cases.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

**STATUS OF THE MEMS INDUSTRY
NEW DRIVERS: THE PATH TO NEW OPPORTUNITIES**

J.C. Eloy
President and CEO
Yole Développement

Now the infrastructure is ready to create more sophisticated applications integrating gyroscopes and magnetometers, generating robust demand for 18.6% average annual growth in sensor units from 2011 to 2016. But there'll be big changes as well, as prices will continue to drop, and a host of players along the complex new value chain all scramble to figure out how best to compete and cooperate for the much bigger business of integrating the silicon sensors into useful functions. Continued price declines will hold revenue growth to a still respectable 11.4% CAGR, to become a \$2.74 billion market opportunity by 2015, but split among a growing crowd of suppliers.

Despite the complexities of designing and fabricating MEMS devices, most of the value in these functions is not actually in the fabrication of the MEMS die. Yole Développement figures the actual cost of front end manufacturing of the MEMS die will account for only about 17% of the total \$2.6 billion total consumer and automotive inertial sensor revenue this year, while the ASIC, the packaging, the test & calibration and the software production costs make up some 41%, leaving roughly 42% total gross margin to be divided up among all the players in the value chain. Moreover, the MEMS die is likely to become an even smaller part of the total cost going forward as the sensors scale to smaller size and ASPs fall. Meanwhile, the demands on the package, the test and the software are growing more complex, and their value is likely to increase.

Outside of the consumer electronics, the applications of MEMS are also increasing both in term of numbers and value. The game is just how to shrink the time to market of such applications and simplify the adoption of MEMS solutions from a module of system maker point of view.

How to reach a \$1Tr MEMS markets? The presentation will highlight YOLE opinion on the collaborative actions to implement to let the MEMS business fly where it has to be: an enabling function helping systems and modules to understand and act on their external environment.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM**REALIZING THE FULL POTENTIAL OF
MEMS DESIGN AUTOMATION**

Stephen Breit, Ph.D.
Vice President Engineering
Coventor, Inc.

Software tools for MEMS and IC designers have the potential to dramatically increase the efficiency of MEMS product development and integration. We propose a deceptively simple criterion for determining whether this potential has been achieved: Software tools must be able to simulate all specs on a product data sheet as well as manufacturing yield with sufficient accuracy and speed to justify the elimination of build-and-test cycles. We first discuss the broad implications of this criterion in light of two industry realities: continuing innovation in MEMS processes, and increasing integration of MEMS and electronics at the package, wafer and process levels. We then review the capabilities of state-of-the-art software tools and methodology versus the criterion and its implied requirements, identifying what is currently possible, and what gaps remain. Our review leads us to identify key requirements for fully realizing the potential of MEMS design automation: improved understanding of MEMS processes through characterization and/or standardization; tools and methodology that enable Design for Manufacturing; and a MEMS verification flow that complements the existing analog/mixed-signal verification flow.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM**HIGH VOLUME ASSEMBLY & TEST SOLUTIONS
TO MEET THE RAPIDLY GROWING MEMS MARKET****Russell Shumway***Sr. Manager, MEMS & Sensor Packaging
Amkor Technology*

We are facing explosive growth of product opportunities as the creative application of known fab techniques are used to create silicon-based MEMS transducers and sensors. With a lack of packaging standards in past years, the form factor of these product solutions have been nearly as diverse as the applications they serve. However, the rapid growth of MEMS can be accelerated when manufacturing approaches become more standard and available. The unique requirements of various sensors will be discussed along with approaches toward streamlining MEMS for high volume manufacturing which can enjoy cost and scale efficiencies of mature manufacturing platforms.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

SPECIAL SESSION

MEMS FOR ALL OF US

The explosion of the MEMS sensor market has brought MEMS devices to consumer products. The use of multi-axis multi-function sensors data to support complex functions, such as navigation, body movement modeling, image stabilization, etc., triggered the emergence of a new industry: sensor data processing software companies.

This session will introduce six companies, and the technology behind their products which are driven by sensors and sensor software. At the post-conference reception attendees will have an opportunity to have hands on demos with the products.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM**FUSING SENSORS INTO MOBILE OPERATING SYSTEMS
AND INNOVATIVE USE CASES****Tristan Joo***Board Director & Co-Chair of Mobile SIG
Wireless Communications Alliance*

Indoor navigation LBS and gesture enabled 3D games using motion sensors, gesture & touchless user interfaces, Augmented Reality, context-aware services - these are the next-generation use cases enabled by the latest advances in MEMS and other sensor technologies. With the next wave of smartphones and tablets proliferating, User Experience (UX) differentiation is becoming ever-more important to stay market-competitive. Yet, mobile apps that utilize such sensors are still underwhelming and fragmentation remains a major issue. However, as the native integration of variety of sensors accelerate across mobile operating systems and as “sensor fusion and standardization” advances innovative use cases, mobile apps, and device designs further, the overall UX enhancements will dramatically transform the mobile industry out to a new frontier.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

HILLCREST LABORATORIES, INC.

Justin Zink

Sales, Marketing and Business Development

The technology behind the Freespace® products that Hillcrest Labs will be demonstrating are MEMS sensors - specifically Accelerometers, Magnetometers and Gyroscopes. These sensors, when combined with Hillcrest's advanced MotionEngine™ sensor calibration and sensor fusion software, enable users to control products and their interfaces through motion. Hillcrest's motion control products are unique due to their industry leading accuracy, precision and intuitiveness. The quality of motion control opens a wide range of applications for the products, including consumer electronics, health and fitness and industrial products.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

MOVEA, INC.

Dave Rothenberg

WW Marketing and Communications

Movea will be demonstrating MotionCore, a family of dedicated motion-processing IP cores optimized for mobile applications. This solution enables customers and partners to quickly add motion intelligence to their products, meaning reduced risk, cost, and Time-to-Market for delivering compelling new motion-based features that create more end-user value such as gesture based interfaces, pedestrian navigation or activity monitoring on mobile platforms. MotionCore components benefits include increased performance and reduced power consumption associated to motion processing for mobile platforms.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM**SENSOR PLATFORMS, INC.****Kevin A. Shaw, Ph.D.***Chief Technology Officer*

Sensor Platforms FreeMotion™ Library: Sensors are the force behind revolutionary changes in the way we use mobile devices. In the first phase, we were taught to move the device to change the screen or to play a game. This 'motion' based approach was mostly about us learning the right gesture for the right function. However, the next phase of sensors will be far more powerful. Now, mobile devices will start adapting to users and start learning to understand our needs. These 'Context Aware' devices are less about motion and more about understanding us. These devices can turn on when we look at them; mute the ringer when we are in a meeting and bounce to voicemail all phone calls when I drive except those from my spouse. Sensor Platforms has already established a powerful presence in the sensor community with its best-in-class Sensor Fusion algorithms, and now we are building the Context Awareness algorithms to usher in the next generation of mobile devices.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

SYRIDE

Romain Lazerand

Consultant

Syrider created a device that is composed of a 9-axis Accelerometer - Magnetometer - Gyrometer which allows for sports practitioners to relive and share their experience. They are currently focusing on surfing and paragliding. Surfers and paragliders will be able to see their "session" in data form like never before: from speed to G-force through 3D movement tracking and many other insights like calories burned, wave height/flight tracking, safety tools, etc. Overall, it will make people progress faster and better making the overall sport evolve even faster!

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

VECTORNAV TECHNOLOGIES

Jeremy Davis, Ph.D.

Director of Engineering

VectorNav will be demonstrating the newly released VN-200 Inertial Navigation Sensor. The VN-200 utilizes 3-axis MEMS accelerometers, magnetometers, gyros, a MEMS pressure sensor, and a GPS module to produce a high accuracy orientation, position, and velocity solution. VectorNav's state of the art sensor fusion software, the Vector Processing Engine (VPE), performs advanced dynamic tuning and disturbance rejection and has been upgraded to handle GPS and pressure sensor measurements on the VN-200. The small form factor combined with its advanced sensor fusion algorithms enables inertial navigation for a wide variety of new and existing applications.

TENTH ANNUAL MEMS TECHNOLOGY SYMPOSIUM

XSENS

Casper Peeters
CEO

Xsens will be demonstrating its motion capture system with on-body motion sensor modules, each containing gyroscopes, accelerometers and magnetometers. The system is widely used by creators of animations for computer games and movies, scientists in sports and biomechanics and many other professionals. At today's rapid decrease in size and costs of MEMS sensors, mass adoption of the body motion tracking technology for consumer applications in gaming, sports or healthcare will soon come within reach.

About MEPTEC

MEPTEC (Microelectronics Packaging and Test Engineering Council) is a trade association of semiconductor suppliers, manufacturers, and vendors concerned exclusively with packaging, assembly, and testing, and is committed to enhancing the competitiveness of the back-end portion of the semiconductor industry. Since its inception over 30 years ago, MEPTEC has provided a forum for semiconductor packaging and test professionals to learn and exchange ideas that relate to packaging, assembly, test and handling. Through our monthly luncheons, and one-day symposiums, and an Advisory Board consisting of individuals from all segments of the semiconductor industry, MEPTEC continuously strives to improve and elevate the roles of assembly and test professionals in the industry. For more information about MEPTEC events and membership visit our website at www.meptec.org.



P.O. Box 222, Medicine Park, OK 73557
Tel: 650-714-1570 Fax: 1-866-424-0130
Email: info@meptec.org

Visit the MEPTEC web site at www.meptec.org for more information.