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MESSAGE FROM THE CHAIRMEN

Dear IEEE SENSORS 2013 participants,

Welcome to Baltimore, Maryland, and to the 12th IEEE SENSORS conference. In addition to an outstanding technical program, an informative tutorial session, and an exciting location, this year we are delighted to present a special industrial panel and an open poster session. This conference promises to be one of the best, if not the best to date.

Consistent with the broad and multidisciplinary technical scope that the IEEE Sensors Council fosters, the IEEE SENSORS Conference strives to offer attendees a wide array of technical subjects covering nine topical areas: (1) Phenomena, Modeling and Evaluation, (2) Chemical and Gas Sensors, (3) Biosensors, (4) Optical Sensors, (5) Mechanical, Magnetic, and Physical Sensors, (6) Sensor/Actuator Systems, (7) Sensor Networks, (8) Applications, and (9) Materials, Processes, Circuits, Signals, and Interfaces.

This year, a total of 913 abstracts were submitted, including 48 late news submissions. Of these, 236 will be presented in lecture sessions and 256 in poster sessions. An additional 16 invited lecture presentations and 22 open posters round out the program. It is important to note that the poster and lecture presentations have undergone identical peer reviews. In which session a paper is presented has no relationship to its quality; it depends only on where the paper best fits into the program. To stay relevant with rapidly evolving commercial trends, this year the program also features a special Industry Panel Session on Tuesday, Nov. 5, to address an exciting and timely topic – Wearable Sensors: the Good, the Bad, and the Alluring. Based on the pre-registrations, the attendance is expected to be between 700 and 800.

The highlights of this year's social program will be the welcome reception and the banquet. The reception will be held on Sunday, Nov. 3, at the Renaissance Harborplace Hotel on the 6th Floor with a view of Baltimore harbor and Ft. McHenry, site of a pivotal Naval battle during the War of 1812. The banquet will be held on Tuesday, Nov. 5, at the historic B&O Railroad Museum which is recognized universally as the birthplace of American railroading (circa 1829).

We wish to recognize and thank our outstanding Keynote Speakers: Professor Masayoshi Esashi of Tohoku University, Japan; Professor Robert Puers of Katholieke Universiteit Leuven, Belgium; and Dr. Kenneth S. Johnson, Senior Scientist at the Monterey Bay Aquarium Research Institute. We are also deeply grateful to our 16 invited speakers. We appreciate their expertise and willingness to share their time with us in Baltimore.

The success of IEEE SENSORS 2013 is due to the dedication of a number of volunteers. The Technical Program Committee (TPC) included 111 volunteers, to whom we are very grateful. Special thanks to Track Chairs Svetlana Tatic-Lucic and Srinivas Tadigadapa (Track 1); Massood Atashbar and Ponnambalam Selvaganapathy (Track 2); Yu-Cheng Lin and Hongrui Jiang (Track 3); Ignacio Matias and Xiaojing Zhang (Track 4); Kukjin Chun and David Elata (Track 5); Oliver Paul and Gijs Krijnen (Track 6); Thomas Newe (Track 7); David Horsley (Track 8), and Kenichi Takahata (Track 9) – their diligence and insight were invaluable to the paper selection process. Special thanks also to Tutorial Chair Massood Tabib-Azar; Industry Panel Organizers Andrew DeHennis, Brain Jamieson, and Andy Oliver; Industrial Panel publicist Walt Besio; Open Poster Chair Troy Nagle (who contributed tirelessly in many other roles as well); Publicity Chair Eddie Grant; and Conference Treasurer Mike McShane.

We also wish to thank the professional conference organizers of Conference Catalysts, LLC, under the leadership of Chris Dyer. Chris, Judy Scharmann and the rest of their team played a vital role in organizing this conference.

The locations of IEEE SENSORS conferences rotate each year; Asia/Pacific to Europe/Africa to the Americas. Next year, IEEE SENSORS 2014 will be held in Valencia, Spain, Nov. 2-5, 2014. We hope to see you there.

IEEE sponsored or cosponsored more than 1000 conferences, and published more than 100 journals last year. The successes of IEEE are due to the more than 200,000 volunteers who serve IEEE each year.



Robert Trew
General Co-Chair



Elliott Brown
General Co-Chair



Yogesh Gianchandani
Technical Program Chair

GENERAL INFORMATION

Registration & Information Desk

The Registration and Information Desk will be open during the following times:

Sunday, November 3	7 AM - 5:30 PM
Monday, November 4	7 AM - 5 PM
Tuesday, November 5	7 AM - 5 PM
Wednesday, November 6	7 AM - 5 PM

Meeting Room Locations

Concurrent Sessions A: Maryland Salon F
Concurrent Sessions B: Maryland Salon E
Concurrent Sessions C: Maryland Salon A
Concurrent Sessions D: Maryland Salon D
Concurrent Sessions E: Watertable ABC
Concurrent Sessions F: Homeland
Poster Sessions: Baltimore AB

Name Badges

All attendees must wear their name badges at all times to gain admission to all Conference events.

Electronic Proceedings

One copy of the Electronic Proceedings will be provided to you on a flash drive. Additional copies may be purchased at the Conference Registration Desk. The purchase price of the Electronic Proceedings will increase after the Conference, so be sure to order your additional copies in advance.

Additional Electronic Proceedings: \$85 USD IEEE Member
Additional Electronic Proceedings: \$100 USD Non Member

Message and Job Market Board

The Message and Job Market Board will be located near the Conference Registration Desk. Posting is allowed by job seekers. Recruiters are not allowed to post.

Conference Attire

Attire during the duration of the Conference is business casual.

Traveler's Checks and Credit Cards

Credit cards, including MasterCard®, Visa® and American Express®, and traveler's checks are accepted at most hotels, restaurants, and souvenir shops.

Tipping Standards

Tipping of 15% is standard for good service and 20% for outstanding service.

Smoking

All meeting rooms and seated functions are smoke free. Please adhere to the smoking policy of the Renaissance Baltimore Harborplace Hotel.

Cellular Phones

As a courtesy to your fellow attendees, please turn off your cell phone ringer during the conference

SOCIAL PROGRAM

Sunday, November 3

Event: Tutorial Lunch

Time: 12:00 PM - 1:30 PM

Location: Baltimore AB

Lunch Speaker: Dr. Steven LeBoeuf, Valencell, Inc.

“Starting a Medical Monitoring Company from Scratch”

Event: Welcome Reception

Time: 6:30 PM - 8:30 PM

Location: Maryland/Baltimore Foyer

Join us for the Welcome Reception on Sunday, November 3, 2013 at the Renaissance Harborplace Hotel on the 6th Floor. Cocktails and hors d'oeuvres will served beginning at 6:30 p.m., with Welcome Remarks at 7:00 p.m.

Monday, November 4

Event: Conference Lunch

Time: 12:45 PM - 2:15 PM

Location: Maryland Salon BC

Tuesday, November 5

Event: Industry Panel Lunch

Time: 12:00 PM – 2:00 PM

Location: Maryland Salon BC

Event: Conference Dinner

Time: 7:00 PM – 10:00 PM

Location: B&O Railroad Museum

Our Conference Gala dinner will be held at The Historic B&O Railroad Museum. Located among Baltimore City's historic southwest neighborhoods, at the original site of the historic Mt. Clare Shops, the B&O Railroad Museum is recognized universally as the birthplace of American railroading. There will be pre-dinner cocktails served as you will have the chance to tour the museum and rail cars. Dinner will follow and you will be treated to the world-class Wayne Goins Jazz Trio, throughout the night!

Transportation will be provided. The first departing bus will leave at 6 PM to take attendees to the B&O Railroad Museum from in front of the conference hotel. Busses will take attendees back to the conference hotel starting at 9 PM.

Your paid registration fee includes one banquet ticket. Guest tickets can be purchased for \$65.00 USD each at the Registration Desk.

Wednesday, November 6

Event: Conference Awards Lunch

Time: 12:15 PM – 2:00 PM

Location: Maryland Salon BC

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Elliott Brown, *Wright State University, USA*

Technical Program Chair

Yogesh Gianchandani, *University of Michigan, Ann Arbor, USA*

Tutorial Chair

Massood Tabib-Azar, *NSF, USA*

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Andrew DeHennis, *Sensors for Medicine and Science, Inc., USA*
Brian Jamieson, *Scientific & Biomedical Microsystems, USA*

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Brian Jamieson, *Scientific & Biomedical Microsystems, USA*
Yogesh Gianchandani, *University of Michigan, Ann Arbor, USA*
Andy Oliver, *University of Michigan, Ann Arbor, USA*
Walt Besio, *University of Rhode Island, USA*
Troy Nagle, *North Carolina State University, USA*
Elliott Brown, *Wright State University, USA*

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Srinivas Tadigadapa, *Penn State University, USA*
Svetlana Tatic-Lucic, *Lehigh University, USA*

Track 2 – Chemical and Gas Sensors

Massood Atashbar, *Western Michigan University, USA*
Ponnambalam Ravi Selvaganapathy, *McMaster University, USA*

Track 3 – Biosensors

Yu-Cheng Lin, *National Cheng Kung University, Taiwan*
Hongrui Jiang, *University of Wisconsin, Madison, USA*

Track 4 – Optical Sensors

Ignacio R. Matias, *Universidad Publica de Navarra, Spain*
Xiaoqing (John) Zhang, *University of Texas at Austin, USA*

Track 5 – Mechanical, Magnetic, and Physical Sensors

Kukjin Chun, *Seoul National University, Korea*
David Elata, *Technion – Israel Institute of Technology, Israel*

Track 6 – Sensor/Actuator Systems

Oliver Paul, *IMTEK, University of Freiburg, Germany*
Gijs Krijnen, *MESA+ Research Institute for Nanotechnology, University of Twente, Netherlands*

Track 7 – Sensor Networks

Thomas Newe, *University of Limerick, Ireland*

Track 8 – Applications

David A. Horsley, *University of California, Davis, USA*

Track 9 – Other Sensor Topics – Materials, Processes, Circuits, Signals & Interfaces, etc

Kenichi Takahata, *University of British Columbia, Canada*

ASIA/OCEANIA TPC

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Technical Program Chair

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EXHIBITORS

ASSIST



The NSF sponsored Center for Advanced Self-Powered Systems of Integrated Sensors and Technologies (ASSIST) is developing nano-enabled energy harvesting and storage, ultra-low power electronics, radios and sensors to create innovative battery-free, body-powered, and wearable health and environment monitoring systems. ASSIST devices will monitor individual health parameters and personal environmental exposures. Long-term sensing will enable patients, doctors, and scientists to make direct correlations between health and environmental toxins leading to chronic disease prediction, management and treatment. ASSIST advances will accelerate environmental health research and clinical trials as well as inform environmental policy.

CST of America, Inc.



Better Sensor through Simulation! CST EM STUDIO® is a 3D electromagnetic simulation software that can help engineers to design and optimize sensors, coils, magnets, actuators, shielding, biomedical devices, magnetic recording, induction heating and transformers. Comprehensive mechanical imports complement robust solving technology and allow many operating conditions to be assessed. Outputs include electric and magnetic field and current distribution, force, torque, inductance, capacitance, flux linkage, heating and mechanical deformation.

GaTech – Institute for Electronics and Nanotechnology



GaTech – Institute for Electronics and Nanotechnology (IEN) is comprised of multiple Electronics and Nanotechnology Research Centers, each offering a unique intellectual focus ranging from basic discovery and innovation to systems realization. IEN provides advanced Nano, Micro, and Bio Laboratories valued in excess of \$400M, with dedicated process and tool support expertise. These open-user, fee based laboratories are available to global academic, industry, and government clientele, offering a unique and comprehensive laboratory and teaming environment. The exhibit booth will provide information and consultation related to the resources available at IEN to the researchers both from Industry and academia.

IEEE GOLD



IEEE Graduates of the Last Decade (GOLD) is a vibrant community of engineers, scientists, and technical experts with member representation across the globe and throughout IEEE societies. It is a membership program to help students transition to young professionals within the larger IEEE community. IEEE young professionals are automatically added to the GOLD member community as they graduate.

IEEE SENSORS Council



The IEEE Sensors Council's purpose is to advance and coordinate work in the field of sensors carried out throughout the IEEE. The Council sponsors the annual IEEE Sensors Conference is responsible for the publication of the IEEE Sensors Journal. The Council's official field of interest is the theory, design, fabrication, manufacturing and application of devices for sensing and transducing physical, chemical, and biological phenomena, with emphasis on the electronics, physics and reliability aspects of sensors and integrated sensor-actuators. More information about the Sensors Council is available at www.ieee-sensors.org

Measurement Science and Technology Journal

Measurement Science and Technology

With 12 issues per year, Measurement Science and Technology publishes articles on new measurement techniques and associated instrumentation. Papers that describe experiments must represent an advance in measurement science or measurement technique rather than the application of established experimental technique. Authors must make this novel aspect clear, bearing in mind the multidisciplinary readership of the journal. Subject coverage includes the theory, practice and application of measurement in physics, chemistry, engineering and the environmental and life sciences from inception to commercial exploitation.

SPIE



SPIE is the international society for optics and photonics, and organizes dozens of conferences annually, including SPIE Photonics West and SPIE Defense, Security, and Sensing.

The SPIE Digital Library houses more than 400,000 technical papers in cutting-edge technologies such as sensors, lasers, imaging, robotics, nanotechnology, solar energy, biophotonics, and communications.

TeraPico



TeraPico is a new start-up company located in Dayton, OH and specializing in THz Sensor Technology. This includes novel THz sources such as 1550-nm driven photoconductive switches and photomixers, novel THz components such

as structured-surface-plasmonic wire-grid polarizers and filters, and novel instruments such as THz impulse generators and ultrawideband tunable sweep oscillators. In addition, TeraPico intends to engage in the development of biomedical and biological sensor systems in collaboration with strategic research partners such as U.S. Medical Schools.

Texas Instruments



Engineering a Smarter Grid - TI is your global smart grid systems partner for secure, economical and future-proof grid infrastructure,

smart meter and home or building automation solutions. -Grid Infrastructure -Smart Electricity Meters -Smart Flow Meters for Gas, Water and Heat -Smart Buildings and IoT -Communication With millions of energy meter ICs shipped over the past decade, Texas Instruments is the global systems provider for innovative, secure, economical and future-proof solutions for the worldwide smart grid. TI offers the industry's broadest smart grid portfolio of metrology expertise, application processors, communication systems, RFID and analog components in readily available silicon with advanced software, tools and support for compliant solutions. Learn more at www.ti.com/smartgrid.

INDUSTRY PANEL

"Wearable Sensors: the Good, the Bad, and the Alluring"

This special Industry Lunch Panel will be held on Tuesday, November 5th from 12:30 p.m. - 2:00 p.m. in Maryland Ballroom BC at the Renaissance Harborplace Hotel (IEEE SENSORS 2013 hotel) on the topic of wearable sensors. Lunch will begin at 12:00 NOON.

Our distinguished group of panelists include:

Ross Alcazar, *XM Squared*
Abhi Chavan, *Corventis Inc*
Kevin M. Haley, *Under Armour, Inc.*
Amar Kendale, *MC10*
Maurizio Macagno, *Heapsylon*
Babak Parviz, *Google*

Industry Panel Moderators

Andrew DeHennis, *Sensors for Medicine and Science, Inc., USA*
Brian Jamieson, *Scientific & Biomedical Microsystems, USA*

Overview:

With their ability to provide real-time feedback about our bodies, our movements, our activities, and our interaction with the world around us, wearable sensors promise to be a pervasive part of our everyday lives. Embedded systems provide wearable sensors with wireless connectivity and grant them a level of computing power undreamed of just a few years ago. This panel will facilitate a discussion about the possibilities for this emerging market as well as some remaining technology challenges, the solution to which will usher in this new revolution.

The panel discussion will focus on are various factors that must guide the design and development process for wearable sensors. In addition to the more common tradeoffs such as battery life, integration level, and feature set, these systems need to address human factors that will allow these devices to become an accepted (or even sought-after) feature of our daily attire. The panelists have a wide variety of approaches and applications for wearable technology and the session will highlight the benefits of their technology and platforms and lessons learned through the development process.

TECHNICAL PROGRAM INFORMATION

The technical program consists of three Keynote Sessions, six parallel Lecture/Special Sessions of contributed papers, and three Poster Sessions that include Late News and Open Posters.

Guide to Understanding Session Numbering

Each session in the technical program is assigned a unique number, which clearly indicates when and where the session is presented. The number of each session is shown before the session title. A typical number is shown below:

Typical Session Number*: **B2L-A**

The first character (i.e., B) indicates the day of the Conference:

A = Monday; **B** = Tuesday; **C** = Wednesday

The second character (i.e., 2) indicates the session time:

1 = morning; **2** = mid-morning; **3** = afternoon; **4** = late-afternoon

The third character (i.e., L) indicates what type of paper the session is:

L = Lecture Session **P** = Poster Session

The fourth character (i.e., A) indicates which room the session is held in:

A= Maryland Salon F

B= Maryland Salon E

C= Maryland Salon A

D= Maryland Salon D

E= Watertable ABC

F= Homeland

****Please see the session grids, starting on page 21***

TECHNICAL PROGRAM - POSTER INFORMATION

Poster Sessions

Three poster sessions will be held in Baltimore AB, from 2:15 p.m. - 3:45 p.m. on Monday, 2:00 p.m. - 3:30 p.m. on Tuesday, and 10:15 a.m. - 12:15 p.m. on Wednesday. Posters will be on display and authors will be available for questions during their appointed time. All poster papers are listed in this program on the day that they are on display.

Guide to Understanding Poster Numbering

Each poster in the technical program is assigned a unique number, which clearly indicates when and where the poster is presented. The number of each poster is shown on the left-hand side, before the title. A typical number is shown below:

Typical Poster Number*: **B3P-K**

The first character (i.e., B) indicates the day of the Conference that the poster will be on display:

A = Monday; **B** = Tuesday; **C** = Wednesday

The second character (i.e., 3) indicates the time of the day the session is held:

1 = morning; **2** = mid-morning; **3** = afternoon; **4** = late-afternoon

The third character (i.e., P) indicates that the paper is a poster.

The fourth character (i.e. K) indicates the category of the poster for that day. ****Please see the poster room layouts, starting on page 28***

MONDAY

G= Chemical and Gas Sensors

H= Biosensors

J= Mechanical, Magnetic, and Physical Sensors

K= Optical Sensors

L= Sensor/Actuator Systems

M= Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.

TUESDAY

G= Chemical and Gas Sensors

H= Biosensors

J= Mechanical, Magnetic, and Physical Sensors

K= Phenomena, Modeling and Evaluation

L= Sensor Networks

M= Applications

N= Open Posters

WEDNESDAY

G= Chemical and Gas Sensors

H= Applications

J= Mechanical, Magnetic, and Physical Sensors

K= Optical Sensors

L= Sensor Networks

M= Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.

N= Open Posters

SESSION GRID - SUNDAY, NOVEMBER 3RD - TUTORIALS

	TRACK A: NOVEL TRENDS IN SENSING ROOM: HOMELAND	TRACK B: INERTIAL MEASUREMENT ROOM: FEDERAL HILL	TRACK C: BIOELECTRONICS ROOM: FELLOWS POINT
7:00 AM - 8:30 AM		TUTORIAL REGISTRATION AND CHECK-IN - MARYLAND FOYER	
8:30 AM - 5:30 PM		CONFERENCE REGISTRATION - MARYLAND FOYER	
8:30 AM - 10:20 AM	COLD ATOM GYROS	MEMS INERTIAL SENSORS: A TECHNOLOGY OVERVIEW	BIOELECTRONICS: ITS FUTURE IN YOUR HEALTH AND WELL BEING ENERGY CONSIDERATIONS AND SELF-POWERED DEVICES
10:20 AM - 10:40 AM		COFFEE BREAK - MARYLAND FOYER	
10:40 AM - 12:00 PM	FAST DNA SEQUENCING BY ELECTRICAL MEANS	DESIGN AND ANALYSIS OF MEMS GYROSCOPES	TECHNOLOGIES FOR WIRELESS BIOSYSTEMS
12:00 PM - 1:30 PM		LUNCH - BALTIMORE AB	
		"STARTING A MEDICAL MONITORING COMPANY FROM SCRATCH"	
1:30 PM - 2:50 PM	ULTIMATE MEMS SENSORS	DESIGN AND ANALYSIS OF MEMS ACCELEROMETERS	TECHNOLOGIES FOR AN IMPLANTABLE NANO-BIO-SENSING LABORATORY
2:50 PM - 3:10 PM		COFFEE BREAK - MARYLAND FOYER	
3:10 PM - 5:00 PM	OPTOMECHANICAL SENSORS	INTERFACE CIRCUITS AND SYSTEMS FOR INERTIAL SENSORS	SYSTEM-INTEGRATION: EXAMPLES OF INNOVATIVE HEALTH PRODUCTS
5:00 PM - 5:30 PM			DEMONSTRATIONS OF MHEALTH MEDICAL DEVICES AND APPS
6:30 PM - 8:30 PM		WELCOME RECEPTION - MARYLAND/BALTIMORE FOYER	

SESSION GRID – MONDAY, NOVEMBER 4TH

	MARYLAND F	MARYLAND E	MARYLAND A	MARYLAND D	WATERTABLE ABC	HOMELAND
7:00 AM - 5:00 PM	REGISTRATION – MARYLAND FOYER					
8:00 AM - 8:30 AM	OPENING REMARKS – MARYLAND BC					
8:30 AM - 9:15 AM	KEYNOTE PRESENTATION 1 – MARYLAND BC "INTEGRATED MEMS BY ADHESIVE BONDING" PROFESSOR MASAYOSHI ESASHI					
9:30 AM - 10:45 AM	A1L-A: GAS CHROMATOGRAPHY	A1L-B: PHOTONICS	A1L-C: PHYSICAL SENSORS I	A1L-D: OPTICAL SENSORS IN HEALTHCARE	A1L-E: SENSOR SYSTEMS	A1L-F: SENSING TECHNIQUES
10:45 AM - 11:15 AM	COFFEE BREAK – MARYLAND FOYER					
11:15 AM - 12:45 PM	A2L-A: GAS SENSORS I	A2L-B: ELECTROCHEMICAL/MICROWAVE	A2L-C: INERTIAL SENSORS	A2L-D: OPTICAL SENSORS FOR PHYSICAL MEASUREMENTS	A2L-E: SYSTEMS FOR HEALTH MONITORING	A2L-F: MISCELLANEOUS SENSORS
12:45 PM - 2:15 PM	LUNCH – MARYLAND BC					
2:15 PM - 3:45 PM	POSTER SESSION – POSTER AREA – BALTIMORE AB					
3:45 PM - 5:00 PM	A4L-A: GAS SENSORS II	A4L-B: BIOMOLECULAR	A4L-C: MAGNETIC SENSORS	A4L-D: OPTICAL SENSORS FOR CHEMICAL ANALYSES	A4L-E: ACTUATOR SYSTEMS	A4L-F: MATERIALS & FABRICATION I

SESSION GRID - TUESDAY, NOVEMBER 5TH

	MARYLAND F	MARYLAND E	MARYLAND A	MARYLAND D	WATERTABLE ABC	HOMELAND
7:00 AM - 5:00 PM	REGISTRATION – MARYLAND FOYER					
8:00 AM - 8:45 AM	KEYNOTE PRESENTATION 2 – MARYLAND BC "IMPLANTABLE CHIPS & SENSORS: QUO VADIS?" PROFESSOR ROBERT PUERS					
9:00 AM - 10:15 AM	B1L-A: HUMIDITY SENSORS	B1L-B: INTERFACE	B1L-C: ACOUSTIC SENSORS	B1L-D: ELECTROMAGNETIC SENSORS & PHENOMENA	B1L-E: WIRELESS SENSOR NETWORKS FOR HEALTH I	B1L-F: INDUSTRIAL & ENVIRONMENTAL
10:15 AM - 10:45 AM	COFFEE BREAK – MARYLAND FOYER					
10:45 AM - 12:00 PM	B2L-A: LIQUID BASED SENSORS	B2L-B: MECHANICAL	B2L-C: TACTILE SENSORS	B2L-D: SENSORS PHENOMENA	B2L-E: WIRELESS SENSOR NETWORKS FOR HEALTH II	B2L-F: MICROSYSTEMS APPLICATIONS
12:00 PM - 2:00 PM	INDUSTRY PANEL LUNCH – MARYLAND BC "WEARABLE SENSORS: THE GOOD, THE BAD, AND THE ALLURING"					
2:00 PM - 3:30 PM	POSTER SESSION – POSTER AREA – BALTIMORE AB					
3:30 PM - 5:00 PM	B4L-A: CARBON NANOTUBES & GRAPHENE	B4L-B: INTEGRATION	B4L-C: PRESSURE SENSORS	B4L-D: INERTIAL SYSTEMS MODELING	B4L-E: WIRELESS SENSOR NETWORKS FOR ENVIRONMENTAL MONITORING	B4L-F: MEDICAL APPLICATIONS
7:00 PM - 10:00 PM	TRANSPORTATION TO B&O RAILROAD MUSEUM – B&O RAILROAD MUSEUM CONFERENCE DINNER – B&O RAILROAD MUSEUM BEGINS AT 6:00PM – PICKUP LOCATION IS IN FRONT OF THE HOTEL					

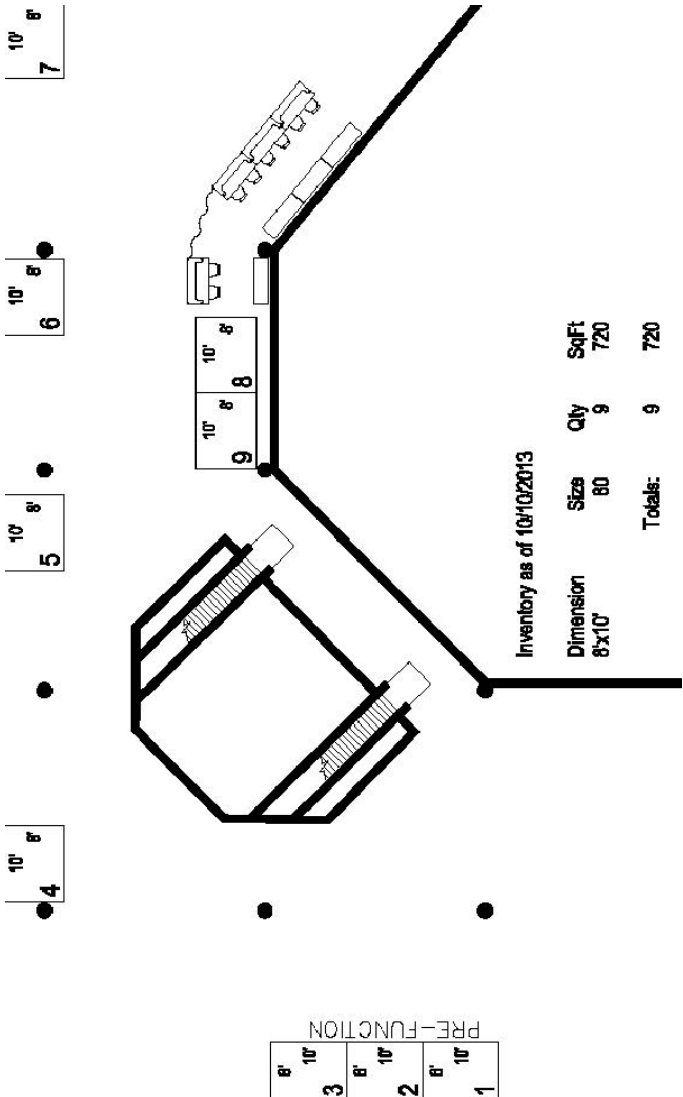
SESSION GRID – WEDNESDAY, NOVEMBER 6TH

	MARYLAND F	MARYLAND E	MARYLAND A	MARYLAND D	WATERTABLE ABC	HOMELAND
7:00 AM - 5:00 PM	REGISTRATION – MARYLAND FOYER					
8:00 AM - 8:45 AM	"BIOARGO: A GLOBAL SCALE CHEMICAL SENSOR NETWORK TO OBSERVE CARBON, OXYGEN, AND NITROGEN CYCLES IN THE OCEAN" DR. KENNETH S. JOHNSON KEYNOTE PRESENTATION – MARYLAND BC					
9:00 AM - 10:15 AM	C1L-A: ELECTROCHEMICAL SENSORS	C1L-B: POWER APPLICATIONS	C1L-C: VISCOSITY, DENSITY AND FLOW SENSORS	C1L-D: OPTICAL IMAGING SENSORS	C1L-E: WIRELESS SENSOR NETWORKS FOR TARGETS & OBJECTS	C1L-F: MATERIALS & FABRICATION II
10:15 AM - 12:15 PM	POSTER SESSION – POSTER AREA – BALTIMORE AB					
12:15 PM - 2:00 PM	CONFERENCE AWARDS LUNCH – MARYLAND BC					
2:00 PM - 3:15 PM	C3L-A: CHEMICAL & GAS SENSORS I	C3L-B: SENSOR APPLICATIONS FOR LIFE AND SOCIETY	C3L-C: PHYSICAL SENSORS II	C3L-D: OPTICAL SENSORS ON SILICON	C3L-E: LATE NEWS I	C3L-F: HARVESTING & CONVERTERS
3:15 PM - 3:45 PM	COFFEE BREAK – MARYLAND FOYER					
3:45 PM - 5:00 PM				C4L-D: OPTICAL SENSOR SIGNAL ANALYSES	C4L-E: LATE NEWS II	C4L-F: CHARACTERIZATION & TESTING
5:00 PM	CONFERENCE ADJOURNS					

EXHIBITOR FLOOR PLAN

Exhibitors are listed below as of October 7th, 2013.

- Booth # 1 – CST of America, Inc
- Booth # 2 – Measurement Science and Technology Journal
- Booth # 3 – SPIE
- Booth # 4 – TeraPico
- Booth # 5 – Texas Instruments
- Booth # 6 – IEEE GOLD
- Booth # 7 – IEEE Sensors Council
- Booth # 8 – GaTech – Institute for Electronics and Nanotechnology
- Booth # 9 – ASSIST



MONDAY POSTER SESSION FLOOR PLAN

The Monday poster session floor plan shows the position of each numbered poster. The three letter and number prefix of each poster has been omitted from this diagram. The following groups, or tracks, are featured in this poster session:

G= Chemical and Gas Sensors

H= Biosensors

J= Mechanical, Magnetic, and Physical Sensors

K= Optical Sensors

L= Sensor/Actuator Systems

M= Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.

****Please reference the Poster Numbers from the program listing starting on page 49. (Ex. The 1st paper listed on page 49 of this program book is G1 and this poster is located in front-right area of the poster room as indicated on the diagram on the following page.)***

MONDAY POSTER SESSION - BALTIMORE AB

M14	M13	L21	L20	L5	L4	K1	J11	H11	H10	G9	G8
M15	M10	L22	L19	L6	L3	K2	J10	H12	H9	G10	G7
M16	M9	L23	L18	L7	L2	K3	J9	H13	H8	G11	G6
M17	M8	L24	L17	L8	L1	K4	J8	H14	H7	G12	G5
	M7	L25	L16	L9	K12	K5	J7	H15	H6	G13	G4
	M6	M1	L15	L10	K11	K6	J6	J1	H5	G14	G3
	M5	M2	L14	L11	K10	K7	J5	J2	H4	H1	G2
	M4	M3	L13	L12	K9	K8	J4	J3	H3	H2	G1

TUESDAY POSTER SESSION FLOOR PLAN

The Tuesday poster session floor plan shows the position of each numbered poster. The three letter and number prefix of each poster has been omitted from this diagram. The following groups, or tracks, are featured in this poster session:

G= Chemical and Gas Sensors

H= Biosensors

J= Mechanical, Magnetic, and Physical Sensors

K= Phenomena, Modeling and Evaluation

L= Sensor Networks

M= Applications

N= Open Posters

****Please reference the Poster Numbers from the program listing starting on page 75. (Ex. The 1st paper listed on page 75 of this program book is G1 and this poster is located in front-right area of the poster room as indicated on the diagram on the following page.)***

TUESDAY POSTER SESSION - BALTIMORE AB

N5	N4	M6	M5	K17	K16	K1	J14	H14	H13	G9	G8
N6	N3	M7	M4	K18	K15	K2	J13	H15	H12	G10	G7
N7	N2	M8	M3	K19	K14	K3	J12	J1	H11	G11	G6
N8	N1	M9	M2	L1	K13	K4	J11	J2	H10	H1	G5
N9	M17	M10	M1	L2	K12	K5	J10	J3	H9	H2	G4
	M16	M11	L8	L3	K11	K6	J9	J4	H8	H3	G3
	M15	M12	L7	L4	K10	K7	J8	J5	H7	H4	G2
	M14	M13	L6	L5	K9	K8	J7	J6	H6	H5	G1

WEDNESDAY POSTER SESSION FLOOR PLAN

The Wednesday poster session floor plan shows the position of each numbered poster. The three letter and number prefix of each poster has been omitted from this diagram. The following groups, or tracks, are featured in this poster session:

G= Chemical and Gas Sensors

H= Applications

J= Mechanical, Magnetic, and Physical Sensors

K= Optical Sensors

L= Sensor Networks

M= Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.

N= Open Posters

****Please reference the Poster Numbers from the program listing starting on page 98. (Ex. The 1st paper listed on page 98 of this program book is G1 and this poster is located in front-right area of the poster room as indicated on the diagram on the following page.)***

N11	N10	M13	M12	L6	L5	K3	K2	H13	H12	G9	G8
N12	N9	M14	M11	L7	L4	K4	K1	H14	H11	G10	G7
N13	N8	M15	M10	L8	L3	K5	J12	J1	H10	G11	G6
	N7	M16	M9	L9	L2	K6	J11	J2	H9	G12	G5
	N6	M17	M8	M1	L1	K7	J10	J3	H8	H1	G4
	N5	M18	M7	M2	K13	K8	J9	J4	H7	H2	G3
	N4	N1	M6	M3	K12	K9	J8	J5	H6	H3	G2
	N3	N2	M5	M4	K11	K10	J7	J6	H5	H4	G1

KEYNOTE SPEAKERS

Monday, November 4th - Professor Masayoshi Esashi

"Integrated MEMS by Adhesive Bonding"

Professor Masayoshi Esashi received the B.E. degree in electronic engineering in 1971 and the Doctor of Engineering degree in 1976 at Tohoku University. He served as a research associate from 1976 and an associate professor from 1981 at the Department of Electronic Engineering, Tohoku University. Since 1990 he has been a professor and he is now in The World Premier International Research Center Advanced Institute for Materials Research (WPI-AIMR) and concurrently in Micro System Integration Center (μ SIC) (director) in Tohoku University. He was a President of Sensor-Micromachine Society in Institute of Electrical Engineers in Japan (2002-2003), a President of Japan Society of Next Generation Sensor Technology (2010~), and a Chairman of MEMS Park Consortium in Sendai (2004). He served as a general co-chairman of the 4th IEEE Micro Electro Mechanical Workshop in 1991 held in Nara, Japan, a general chairman of the 10th International Conference on Solid-State Sensors and Actuators (Transducers 99) in 1999 held in Sendai, Japan and also as the Technical Program Chairman of IEEE Sensors 2006 held in Daegu, Korea. He has been studying microsensors and integrated microsystems.

Tuesday, November 5th - Professor Robert Puers

"Implantable chips and sensors: quo vadis?"

Robert (Bob) Puers received his Ph.D. in 1986 at the Katholieke Universiteit te Leuven. He is a European pioneer in the research on micromachining, MEMS and packaging techniques, mainly for biomedical implantable systems. To this purpose, he installed a dedicated clean room for sensor and electronic packaging technology, that now runs for more than 25 years under his guidance. In 2014, a new research facility will house his research team. Recently, microfluidic and optical MEMS based on polymers have been added to the backbone of his sensor research. Besides MEMS, his work also focuses on low power systems, smart interfaces, inductive power and wireless communication. Devices developed range from bladder pressure and eye pressure monitoring, over instrumented orthopedic implants, to implanted pumps for assisted blood perfusion. One spinout of this research team are the design guidelines to improve the efficiency of power induction (with coil systems), that have been bundled in two books. He took major efforts to increase the impact of MEMS and Microsystems in both the international research community as well as in industry. He helped to launch three spin-off companies, ICsense, Zenso and MinDCet. Dr. Puers is also an IEEE and IoP fellow.

Wednesday, November 6th - Dr. Kenneth S. Johnson

“BioArgo: a global scale chemical sensor network to observe carbon, oxygen, and nitrogen cycles in the ocean”

Kenneth S. Johnson is a Senior Scientist at the Monterey Bay Aquarium Research Institute. He received his B.S. in Chemistry and Oceanography from the University of Washington and his Ph.D. in Oceanography from Oregon State University. His research interests are focused on the development of chemical sensors that can be deployed in large scale, wireless sensor networks and application of these tools to studies of chemical cycling throughout the ocean. His lab group has developed sensors for a variety of seawater nutrients, pH and field portable, analytical systems for trace elements such as iron, cobalt, manganese and zinc. The sensors are integrated into commercially available platforms and sensor networks are deployed throughout the coastal ocean and in remote regions of the open ocean where they report back to the Internet in real time. These sensors and analyzers have been used in a variety of pioneering studies, including the first open ocean iron fertilization experiments. He is author of more than 130 papers in scientific journals, including 16 papers in the journals Science and Nature. Johnson was elected Fellow of the American Geophysical Union in 2011.

SUNDAY, NOVEMBER 3RD - TUTORIALS

7:00 AM - 8:30 AM

REGISTRATION

Maryland Foyer

8:30 AM - 10:20 AM

Track A: Novel Trends in Sensing

Room: Homeland

COLD ATOM GYROS

Todd Gustavson, *AOSense, Inc.*

8:30 AM - 10:20 AM

Track B: Inertial Measurement

Room: Federal Hill

MEMS INERTIAL SENSORS: A TECHNOLOGY OVERVIEW

Farrokh Ayazi, *Georgia Tech Institute*

8:30 AM - 9 AM

Track C: Bioelectronics

Room: Fells Point

BIOELECTRONICS: ITS FUTURE IN YOUR HEALTH AND WELL BEING

Veena Misra, *NCSU ERC for Advanced Self-Powered Systems of Integrated Sensors and Technologies*

9:00 AM - 10:20 AM

Track C: Bioelectronics

Room: Fells Point

ENERGY CONSIDERATIONS AND SELF-POWERED DEVICES

John Muth, *NCSU ERC for Advanced Self-Powered Systems of Integrated Sensors and Technologies*

10:20 AM - 10:40 AM

Coffee Break

Room: Maryland Foyer

10:40 AM - 12 PM

Track A: Novel Trends in Sensing

Room: Homeland

FAST DNA SEQUENCING BY ELECTRICAL MEANS

Massimiliano Di Ventra, *UC San Diego*

10:40 AM – 12:00 PM
Track B: Inertial Measurement
Room: Federal Hill

DESIGN AND ANALYSIS OF MEMS GYROSCOPES
Faisal Zaman, *Qualtré*

10:40 AM - 12 PM
Track C: Bioelectronics
Room: Fells Point

TECHNOLOGIES FOR WIRELESS BIOSYSTEMS
Maysam Ghovanloo, *Georgia Institute of Technology*

12:00 PM - 1:30 PM
Lunch
Room: Baltimore AB

Luncheon Speaker: Dr. Steven LeBoeuf, *Valencell, Inc.*

STARTING A MEDICAL MONITORING COMPANY FROM SCRATCH

1:30 PM - 2:50 PM
Track A: Novel Trends in Sensing
Room: Homeland

ULTIMATE MEMS SENSORS
Siavash Pourkamali, *University of Texas at Dallas*

1:30 PM - 2:50 PM
Track B: Inertial Measurement
Room: Federal Hill

DESIGN AND ANALYSIS OF MEMS ACCELEROMETERS
Diego E. Serrano, *Qualtré*

1:30 PM - 2:50 PM
Track C: Bioelectronics
Room: Fells Point

TECHNOLOGIES FOR AN IMPLANTABLE NANO-BIO-SENSING LABORATORY
Sandro Carrara, *Swiss Federal Institute of Technology – Lausanne*

2:50 PM - 3:10 PM
Coffee Break
Room: Maryland Foyer

3:10 PM – 5:00 PM

Track A: Novel Trends in Sensing

Room: Homeland

OPTOMECHANICAL SENSORS

Gaurav Bahl, *University of Illinois at Urbana-Champaign, USA*

3:10 PM – 5:00 PM

Track B: Inertial Measurement

Room: Federal Hill

INTERFACE CIRCUITS AND SYSTEMS FOR INERTIAL SENSORS

Arashk N. P. Shirazi, *Georgia Tech University*

3:10 PM – 5:00 PM

Track C: Bioelectronics

Room: Fells Point

SYSTEM-INTEGRATION: EXAMPLES OF INNOVATIVE HEALTH PRODUCTS

James Weiland, *USC ERC for Biomimetic MicroElectronic Systems*

5 PM - 5:30 PM

Track C: Bioelectronics

Room: Fells Point

DEMONSTRATIONS OF MHEALTH MEDICAL DEVICES AND APPS

Amy Schiffman, *Capital Health Advocates & Capital House Calls*

H. Troy Nagle, *NC State*

6:30 PM – 8:30 PM

Welcome Reception

Room: Maryland/Baltimore Foyer

MONDAY, NOVEMBER 4TH

8:00 AM – 8:30 AM

Maryland BC

OPENING REMARKS

8:30 AM - 9:15 AM

PLENARY – KEYNOTE – PROFESSOR MASAYOSHI ESASHI

Maryland BC

Session Chair: Elliott Brown (Wright State University, USA)

INTEGRATED MEMS BY ADHESIVE BONDING

Masayoshi Esashi, Shuji Tanaka

Tohoku University, Japan

9:30 AM - 10:45 AM

A1L-A: GAS CHROMATOGRAPHY

Maryland F

Session Chairs: Massood Atashbar (Western Michigan University, USA), Ponnambalam Ravi Selvaganapathy (McMaster University, Canada)

9:30 AM

INVITED TALK: SMART MULTI-DIMENSIONAL GAS CHROMATOGRAPHY

Xudong Fan

University of Michigan, United States

10:00 AM

WIDTH-MODULATED MICROGAS CHROMATOGRAPHY SEPARATION COLUMNS WITH SILICA NANOPARTICLES STATIONARY PHASE

Hamza Shakeel, Dong Wang, Randy Heflin, Masoud Agah

Virginia Tech, United States

10:15 AM

DETECTION OF EXPLOSIVES USING ORTHOGONAL GAS SENSORS

Yun Chu, Daniel Mallin, Matin Amani, Otto Gregory

University of Rhode Island, United States

10:30 AM

MICROSENSOR ANALYSES FOR TRACE TARGETS OVER EXTENDED TIMES IN A SIMULATED MARTIAN ENVIRONMENT

Kurt D. Benkstein¹, Philip H. Rogers¹, Christopher B. Montgomery¹, Steve Semancik¹, C. Jerry Jin², Baranidharan Raman²

¹National Institute of Standards and Technology, United States;

²Washington University in St. Louis, United States

9:30 AM - 10:45 AM

A1L-B: PHOTONICS

Maryland E

Session Chairs: Christopher Salthouse (University of Massachusetts, Amherst, USA), Zheyao Wang (Tsinghua University, China)

9:30 AM

INVITED TALK: ELECTRONIC LABEL-FREE BIOSENSING ASSAYS

Mark Reed

Yale University, United States

10:00 AM

FABRICATION AND CHARACTERIZATION OF A DUAL-MODE SPR/SERS SENSOR BASED ON PLASMONIC NANODOME ARRAYS

Charles Choi, Steve Semancik

National Institute of Standards and Technology, United States

10:15 AM

LABEL-FREE PLASMONIC IMMUNOSENSING FOR PLASMODIUM IN WHOLE BLOOD

Sang-Yeon Cho¹, Jayson Briscoe¹, Immo Hansen¹, Jesse Smith¹, Yoomi Chang¹, Igal Brener²

¹New Mexico State University, United States; ²Sandia National Laboratories, United States

10:30 AM

COMPACT, LOW COST CMOS INTEGRATED SPR BIOSENSOR SYSTEM

Santosh Koppa, Youngjoong Joo

University of Texas at San Antonio, United States

9:30 AM - 10:45 AM

A1L-C: PHYSICAL SENSORS I

Maryland A

Session Chairs: Mitsuhiro Shikida (Nagoya University, Japan), David Elata (Technion - Israel Institute of Technology, Israel)

9:30 AM

MEMS ELECTRIC-FIELD SENSOR WITH LEAD ZIRCONATE TITANATE (PZT)-ACTUATED ELECTRODES

Simon Ghionea, Gabriel Smith, Jeffrey Pulskamp, Sarah Bedair, Christopher Meyer, David Hull

US Army Research Laboratory, United States

9:45 AM

A MICRODISCHARGE-BASED NEUTRON RADIATION DETECTOR UTILIZING SPUTTERED GADOLINIUM FILMS FOR NEUTRON CONVERSION

Ravish Malhotra, Yogesh B. Gianchandani

University of Michigan, United States

10:00 AM

GRANULAR RADIO ENERGY-SENSING NODE (GREEN): A 0.56 CM³ WIRELESS STICK-ON NODE FOR NON-INTRUSIVE ENERGY MONITORING

Rafael Send¹, Qiliang Richard Xu¹, Igor Paprotny², Richard White¹, Paul Wright¹

¹University of California, Berkeley, United States; ²University of Illinois, United States

10:15 AM

INTEGRATED PASSIVE AND WIRELESS SENSOR FOR MAGNETIC FIELDS, TEMPERATURE AND HUMIDITY

Bodong Li, Omar Yassine, Jürgen Kosel

King Abudllah University of Science and Technology, Saudi Arabia

10:30 AM

A NOVEL IN-LINE TYPE FREQUENCY DETECTOR BASED ON MEMS MEMBRANE FOR X-BAND APPLICATION

Zhenxiang Yi, Xiaoping Liao

Southeast University, China

9:30 AM - 10:45 AM

A1L-D: OPTICAL SENSORS IN HEALTHCARE

Marlyand D

Session Chairs: Elfed Lewis (University of Limerick, Ireland)

Candid Reig (University of Valencia, Spain)

9:30 AM

TACTILE AND HYPERSPECTRAL IMAGING SENSORS FOR MAMMARY TUMOR CHARACTERIZATION

Amrita Sahu, Firdous Saleheen, Vira Oleksyuk, Yi Chen, Chang-Hee Won

Temple University, United States

9:45 AM

A FABRY-PEROT INTERFEROMETRY BASED MRI-COMPATIBLE MINIATURE UNIAXIAL FORCE SENSOR FOR PERCUTANEOUS NEEDLE PLACEMENT

Weijian Shang, Hao Su, Gang Li, Cosme Furlong, Gregory Fischer

Worcester Polytechnic Institute, United States

10:00 AM

HIGH RESOLUTION FLUORESCENCE-BASED TEMPERATURE SENSOR FOR STAND-OFF DETECTION IN PHYSIOLOGICAL RANGE

Timothy Kuester, Ryan Robucci, Hung Lam, Govind Rao, Yordan Kostov

University of Maryland Baltimore County, United States

10:15 AM

THE CONTACTLESS ACTIVE OPTICAL SENSOR FOR VEHICLE DRIVER FATIGUE DETECTION

Krzysztof Murawski², Tadeusz Sondej², Krzysztof Rózanowski¹, Olaf Truszczynski¹, Marian Macander¹, Lukasz Macander¹

¹Military Institute of Aviation Medicine, Poland; ²Military University of Technology, Poland

10:30 AM

CMOS CHIP WITH MULTI JUNCTION PHOTO DETECTOR FOR SENSING BIOMEDICAL SIGNALS

Stefan Schidl, Eugenijus Kaniusas, Horst Zimmermann
Technische Universität Wien, Austria

9:30 AM - 10:45 AM

A1L-E: SENSOR SYSTEMS

Watertable ABC

Session Chairs: Konandur Rajanna (IIS Bangalore, India), Oliver Paul (University of Freiburg - IMTEK, Germany)

9:30 AM

FLOW MEASUREMENT IN OPEN CHANNELS BY USING AN ULTRASONIC PHASED ARRAY SENSOR

Manuel Haide, Wolfgang Schroer
Ulm University of Applied Sciences, Germany

9:45 AM

QUANTIFYING MODAL SHAPES IN SMART PIEZOELECTRIC ULTRASONIC TRANSDUCER ARRAY: MODELING AND EXPERIMENT

M.A. Matin¹, K. Ozaki², Y. Numata², D. Akai², K. Sawada², M. Ishida²
¹*Bangladesh University of Engineering and Technology, Bangladesh;*
²*Toyohashi University of Technology, Japan*

10:00 AM

ROOM TEMPERATURE IONIC-LIQUID ELECTROCHEMICAL GAS SENSOR ARRAY SYSTEM FOR REAL-TIME MINE SAFETY MONITORING

Haitao Li¹, Xiaoyi Mu¹, Zhe Wang², Min Guo², Xiangqun Zeng², Andrew Mason¹
¹*Michigan State University, United States;* ²*Oakland University, United States*

10:15 AM

HIGH SENSITIVITY ACCELEROMETER OPERATING ON THE BORDER OF STABILITY WITH DIGITAL SLIDING MODE CONTROL

Elie Hanna Sarraf, Ahmad Sharkia, Siamak Moori, Mrigank Sharma, Edmond Cretu
University of British Columbia, Canada

10:30 AM

PULSED EDDY CURRENT IMAGING DEVICE FOR NON DESTRUCTIVE EVALUATION APPLICATIONS

Pierre-Yves Joubert², Yohan Le Diraison¹, Zhou Xi¹, Eric Vourc'h¹
¹*École Normale Supérieure de Cachan, France;* ²*Université Paris Sud, France*

9:30 AM - 10:45 AM

A1L-F: SENSING TECHNIQUES

Homeland

Session Chairs: Hong Yu (Arizona State University, USA), Gaurav Bahl (University of Illinois at Urbana-Champaign, USA)

9:30 AM

A STANDARD LOW-NOISE SENSOR INTERFACE FOR 0.66NJ/STEP-ENERGY-EFFICIENT, MOBILE BAROMETRIC-PRESSURE-BASED ALTITUDE SENSING

Marko Mailand, Stefan Getzlaff, Raik Richter, Steffen Apel, Daniel Breitmeyer, Ute Meyer, Enno Böhme, Ronald Schreiber, Kornelius Töws, Dieter Günther

Zentrum Mikroelektronik Dresden AG, Germany

9:45 AM

READOUT SCHEME FOR RESISTIVE CHIPLESS WIRELESS SENSORS

Martin Schübler, Bernd Kubina, Christian Mandel, Rolf Jakoby

Technische Universität Darmstadt, Germany

10:00 AM

ANALYSIS AND EFFICIENT ONSET TIME DETECTION OF ACOUSTIC EMISSION SIGNALS WITH POWER CONSTRAINED SENSOR PLATFORMS

Benjamin Babjak, Sandor Szilvasi, Peter Volgyesi, Ozgur Yapar, Prodyot K. Basu

Vanderbilt University, United States

10:15 AM

POSFET TACTILE SENSING CHIPS USING CMOS TECHNOLOGY

Ravinder S. Dahiya³, Andrea Adami¹, Cristian Collini¹, Maurizio Valle², Leandro Lorenzelli¹

¹Fondazione Bruno Kessler, Italy; ²Università degli Studi di Genova, Italy; ³University of Glasgow, United Kingdom

10:30 AM

TERAHERTZ EMISSION AND DETECTION USING TWO DIMENSIONAL PLASMONS IN SEMICONDUCTOR NANO-HETEROSTRUCTURES FOR SENSING APPLICATIONS

Taiichi Otsuji³, Takayuki Watanabe³, Stephane Boubanga Tombet³, Tetsuya Suemitsu³, Victor Ryzhii³, Vyatcheslav Popov², Wojciech Knap¹

¹University of Montpellier-CNRS, France; ²Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch), Russia; ³Tohoku University, Japan

11:15 AM - 12:45 PM

A2L-A: GAS SENSORS I

Maryland F

Session Chairs: Oliver Brand (Georgia Institute of Technology, USA), Goutam Koley (University of South Carolina, USA)

11:15 AM

DEVELOPMENT OF MICRO-HOTPLATE WITH TAN HEATER BASED CU-DOPED SNO₂ GAS SENSOR FOR LOW CONCENTRATION OF H₂S GAS

Jin-Chern Chiou¹, Shang-Wei Tsai¹, Chia-Yang Lin¹

¹National Chiao-Tung University, Taiwan; ²China Medical University, Taiwan

11:30 AM

MOLECULARLY IMPRINTED POLYMER COATED AU NANOPARTICLE SENSOR FOR ALPHA-PINENE VAPOR DETECTION

Bin Chen, Chuanjun Liu, Xiao Sun, Kenshi Hayashi

Kyushu University, Japan

11:45 AM

A DUAL MODE SOI CMOS MEMS BASED THERMAL CONDUCTIVITY AND IR ABSORPTION GAS SENSOR

Sohab Sarfraz, Vasant Kumar, Florin Udrea

University of Cambridge, United Kingdom

12:00 PM

A MICRO HELIUM-DISCHARGE PHOTOIONIZATION DETECTOR FOR GAS SENSING

Shree Narayanan¹, Masoud Agah¹, Gary Rice²

¹Virginia Tech, United States; ²College of William and Mary, United States

12:15 PM

FULLY INTEGRATED SYSTEM-ON CHIP GAS SENSOR IN CMOS TECHNOLOGY

Christoph Gamauf³, Martin Siegele³, Alexander Nemecek³, Giorgio Mutinati², Stephan Steinhauer², Elise Brunet², Anton Köck², Jochen Kraft¹, Joerg Siegert¹, Franz Schrank¹

¹ams AG, Austria; ²Austrian Institute of Technology GmbH, Austria;

³University of Applied Sciences Wiener Neustadt, Austria

12:30 PM

THERMALLY-ASSISTED TRANSIENT ANALYSIS FOR REDUCING THE RESPONSE TIME OF MICROHOTPLATE GAS SENSORS

Alexander Vergara, Kurt D. Benkstein, Steve Semancik

National Institute of Standards and Technology, United States

11:15 AM - 12:45 PM

A2L-B: ELECTROCHEMICAL/MICROWAVE

Maryland E

**Session Chairs: Long Que (Louisiana Tech University, USA),
Zhihong Li (Peking University, China)**

11:15 AM

**RAPID DETECTION OF PROGESTERONE BY COMMERCIALY
AVAILABLE MICROELECTRODE CHIPS**

Haochen Cui, Cheng Cheng, Jayne Wu, Shigetoshi Eda
University of Tennessee, Knoxville, United States

11:30 AM

**THE EFFECT OF VITAMIN C FOR POINT-OF-CARE BLOOD
ANALYSIS APPLICATIONS USING AN ELECTROCHEMICAL
BIOSENSOR**

Hadar Ben-Yoav¹, Sheryl Chocron¹, Thomas Winkler¹, Eunkyong
Kim¹, Gregory Payne¹, Reza Ghodssi¹, Deanna Kelly²
¹*University of Maryland, United States;* ²*University of Maryland School
of Medicine, United States*

11:45 AM

**HIGH THROUGHPUT LOW COST ELECTROCHEMICAL DEVICE
FOR S.AUREUS BACTERIA DETECTION**

Mohammadali Safavieh, Minhaz Uddin Ahmed, Mohammed Zourob
Université du Québec, Canada

12:00 PM

**A CELL IMPEDANCE SENSOR CHIP FOR CANCER CELLS
DETECTION WITH SINGLE CELL RESOLUTION**

Tien Anh Nguyen, Tsung-I Yin, Gerald Urban
IMTEK, University of Freiburg, Germany

12:15 PM

**THZ SIGNATURES OF DNA IN NANOCHANNELS UNDER
ELECTROPHORETIC CONTROL**

Elliott Brown³, Edgar Mendoza¹, Yulia Kuznetsova², Alexander
Neumann², Steven Brueck²
¹*Redondo Optics, Inc., United States;* ²*University of New Mexico,
United States;* ³*Wright State University, United States*

12:30 PM

**A NEW DIELECTRIC DISPERSION ANALYSIS USING MICROWAVE
BIO-MICROSENSOR FOR MINUTE DROPLET OF LIPOSOME
SUSPENSION WITH TARGET BIOMOLECULES BY S-PARAMETER
METHOD**

Keisuke Takada, Kaoru Yamashita, Minoru Noda
Kyoto Institute of Technology, Japan

11:15 AM - 12:45 PM

A2L-C: INERTIAL SENSORS

Maryland A

Session Chairs: Kukjin Chun (Seoul National University, South Korea), David Horsley (University of California, Davis, USA)

11:15 AM

INVITED TALK: BIOINSPIRED TOUCH SENSORS FOR MEDICAL APPLICATIONS

Chang Liu

Northwestern University, United States

11:45 AM

MEMS DISK RESONATOR GYROSCOPE WITH INTEGRATED ANALOG FRONT-END

Tsang-Hung Su², Sarah Nitzan², Parsa Taheri-Tehrani², Mitchell Kline¹, Bernhard Boser¹, David Horsley²

¹University of California, Berkeley, United States; ²University of California, Davis, United States

12:00 PM

DESIGN, FABRICATION AND CHARACTERISATION OF A BIOMIMETIC ACCELEROMETER INSPIRED BY THE CRICKET'S CLAVATE HAIR

Harmen Droogendijk, Meint de Boer, Remco Sanders, Gijs J.M Krijnen
University of Twente, Netherlands

12:15 PM

SUB-1G MEMS ACCELEROMETER

Daisuke Yamane², Toshifumi Konishi¹, Takaaki Matsushima¹, Gou Motohashi², Ken Kagaya², Hiroyuki Ito², Noboru Ishihara², Hiroshi Toshiyoshi³, Katsuyuki Machida^{1,2}, Kazuya Masu²

¹NTT Advanced Technology Corporation, Japan; ²Tokyo Institute of Technology, Japan; ³University of Tokyo, Japan

12:30 PM

A SENSITIVE THREE-AXIS MICROMACHINED ACCELEROMETER BASED ON AN ELECTROSTATICALLY SUSPENDED PROOF MASS

Fengtian Han², Boqian Sun², Linlin Li², Gaoyin Ma¹

¹Beijing Institute of Aerospace Control Device, China; ²Tsinghua University, China

11:15 AM - 12:45 PM

A2L-D: OPTICAL SENSORS FOR PHYSICAL MEASUREMENTS

Maryland D

Session Chairs: Francisco J. Arregui (Universidad Publica de Navarra, Spain), Yong-Lae Park (Carnegie Mellon University, USA)

11:15 AM

INVITED TALK: OPTOELECTRONIC TWEEZERS AND LIGHT ACTUATED MICROFLUIDICS

Ming Wu

University of California, Berkeley, United States

11:45 AM

MICRO-MACHINED FABRY-PÉROT INTERFEROMETER FOR THERMAL INFRARED

Mikko Tuohiniemi², Antti Näsilä², Jarkko Antila², Heikki Saari², Martti Blomberg¹

¹VTT Memsfab Ltd, Finland; ²VTT Technical Research Centre of Finland, Finland

12:00 PM

A LOW MODE CONFINEMENT INTEGRATED WAVEGUIDE PLATFORM FOR HIGH RESOLUTION DISPLACEMENT SENSING

Marcel Pruessner, Doewon Park, Todd Stievater, William Rabinovich
Naval Research Laboratory, United States

12:15 PM

OPTICAL SENSOR TECHNOLOGY FOR SIMULTANEOUS MEASUREMENT OF PARTICLE SPEED AND CONCENTRATION OF MICRO SIZED PARTICLES

Casper Clausen, Anpan Han, Martin Kristensen, Anders Bentien
Aarhus University, Denmark

12:30 PM

OPTICAL BACKSCATTER MEASUREMENT OF CLOUD PARTICULATES

Rahul Dixit², Walter Zheng², Ashley Hatfield², J. Gerardi², G. Hickman², William Doak¹, Paul Chiarot¹, David Klotzkin¹

¹Binghamton University, United States; ²Innovative Dynamics Inc., United States

11:15 AM - 12:45 PM

A2L-E: SYSTEMS FOR HEALTH MONITORING

Watertable ABC

Session Chairs: Tarun Bhattacharya (Indian Institute of Technology, Kharapur, India), Mitsuhiro Shikida (Nagoya University, Japan)

11:15 AM

GLUCOSE SENSING AND DRIVEN "ORGANIC ENGINE" WITH CO-IMMOBILIZED ENZYME MEMBRANE FOR ACTUATION BY BLOOD SUGAR IN DIABETES

Munkhbayar Munkhjargal, Kumiko Miyajima, Yuki Matsuura, Kohdai Hatayama, Ming Ye, Takahiro Arakawa, Hiroyuki Kudo, Kohji Mitsubayashi

Tokyo Medical and Dental University, Japan

11:30 AM

EMBEDDED DEVICE FOR SIMULTANEOUS RECORDING AND STIMULATION FOR RETINA IMPLANT RESEARCH

Mario Schloesser, Oscar Cota, Roger Heil, Janis Brusius, Andreas Offenhäusser, Stefan van Waasen, Michael Schiek

Forschungszentrum Juelich GmbH, Germany

11:45 AM

A CONTACT LENS SENSOR SYSTEM WITH A MICRO-CAPACITOR FOR WIRELESS INTRAOCULAR PRESSURE MONITORING

Yu-Chieh Huang¹, Guan-Ting Yeh¹, Tzu-Sen Yang¹, Jin-Chern Chiou^{1,2}

¹National Chaio Tung University, Taiwan; ²China Medical University Hospital, Taiwan

12:00 PM

AN IMPACT SENSING PLATFORM FOR SPINAL CORD INJURY EXPERIMENTS

Manuel Ochoa, Rahim Rahimi, Babak Ziaie, Riyi Shi

Purdue University, United States

12:15 PM

SKIN-SURFACE-COUPLED PERSONAL HEALTH MONITORING SYSTEM

Yu-Pin Hsu, Darrin Young

University of Utah, United States

12:30 PM

ACTIVE SENSING OF INDOOR HUMAN SCENARIOS THROUGH MOBILE PYROELECTRIC INFRARED SENSORS

Rui Ma², Qi Hao², Xueyong Li¹

¹Shandong University, China; ²University of Alabama, United States

11:15 AM - 12:45 PM

A2L-F: MISCELLANEOUS SENSORS

Homeland

Session Chairs: Kenichi Takahata (University of British Columbia, Canada), Andrew Mason (Michigan State University, USA)

11:15 AM

PASSIVE DISPLACEMENT SENSING USING BACKSCATTER RFID WITH MULTIPLE LOADS

Jonathan Becker, Matthew Trotter, Joshua Griffin

Disney Research, United States

11:30 AM

MWCNT/COTTON-BASED FLEXIBLE ELECTRODE FOR ELECTROCARDIOGRAPHY

Chee Leong Lam, Nik Nur Zuliyana Rajdi, Dedy Wicaksono

Universiti Teknologi Malaysia, Malaysia

11:45 AM

LOW-COST FLUORESCENCE-BASED TEMPERATURE SENSING SYSTEM FOR NEONATAL CARE

Kirit Chatterjee, Hung Lam, Ryan Robucci, Govind Rao, Yordan Kostov

University of Maryland Baltimore County, United States

12:00 PM

WIRELESS HIGH-TEMPERATURE SENSING WITH A CHIPLESS TAG BASED ON A DIELECTRIC RESONATOR ANTENNA

Bernd Kubina, Martin Schüßler, Christian Mandel, Arshad Mehmood, Rolf Jakoby

Technische Universität Darmstadt, Germany

12:15 PM

**ENERGY-EFFICIENT MRAM ACCESS SCHEME USING HYBRID
CIRCUITS BASED ON SPIN-TORQUE SENSORS**

Mrigank Sharad, Rangharajan Venkatesan, Xuanyao Fong, Anand
Raghunathan, Kaushik Roy
Purdue University, United States

12:30 PM

**MULTICOLOR COLLOIDAL QUANTUM DOT BASED LIGHT
EMITTING DIODES USING A SOLUTION PROCESSED ELECTRON
TRANSPORTING LAYER**

Gauri Bhawe, Youngkyu Lee, Kazunori Hoshino, Xiaojing Zhang
University of Texas, Austin, United States

MONDAY, NOVEMBER 4TH – POSTER SESSION

2:15 PM - 3:45 PM

A3P-G: GAS SENSORS III

Poster Area - Baltimore AB

Session Chairs: Marcel Pruessner (Naval Research Laboratory, USA), I-Yu Huang (National Sun Yat-sen University, Taiwan)

A3P-G1

DETECTION OF STYRENE BY SAW SENSOR BASED ON HYDROGEN-BOND ACIDIC POLYMER

Yang Wang, Xiaosong Du, Yin Long, Yi Li, Yadong Jiang
University of Electronic Science and Technology of China, China

A3P-G2

FERRITE MATERIALS FOR GAS SENSING APPLICATIONS

Thanasak Sathiwitayakul³, Emma Newton³, Ivan Parkin³, Maxim Kuznetsov¹, Russell Binions²

¹All-Russian Research Institute on Problems of Civil Defence and EMERCOM, Russia; ²Queen Mary, University of London, United Kingdom; ³University College London, United Kingdom

A3P-G3

SIC GAS SENSOR ARRAYS FOR EXTREME ENVIRONMENTS

Sandip Roy, Ben Furnival, Neal Wood, Konstantin Vassilevski, Nick Wright, Alton Horsfall, Chris O'Malley
Newcastle University, United Kingdom

A3P-G4

INN NANOWIRES BASED MULTI-MODAL ENVIRONMENTAL SENSORS

Alina Wilson, Ifat Jahangir, Ehtesham Quddus, Amol Singh, Goutam Koley
University of South Carolina, United States

A3P-G5

ULTRATHIN RECONFIGURABLE MOLECULAR FILTER FOR GAS-SELECTIVE SENSING

Masahiro Imahashi, You Chiyomaru, Kenshi Hayashi
Kyushu University, Japan

A3P-G6

ENHANCED AMMONIA SENSING PROPERTIES USING AU DECORATED ZNO NANORODS

V.P. Dinesh², P. Biji², Arun K. Prasad¹, Ashok K. Tyagi¹
¹Indira Gandhi Centre for Atomic Research, India; ²PSG Institute of Advanced Studies, India

A3P-G7

VOLATILE ORGANIC COMPOUNDS OPTICAL FIBER GAS SENSOR BASED ON EVANESCENT FIELD COUPLING AND SOLVATOCHROMISM

Jae-Sung Lee², Sang-Won Lee², Hyun-Min Jeong², Sung-Woo Lim², Eun-Yoon Jang², Na-Rae Yoon², Dae-Hyuk Kwon¹, Shin-Won Kang²
¹Kyungil University, Korea, South; ²Kyungpook National University, Korea, South

A3P-G8

HIERARCHICAL POROUS SnO₂ TOPOLOGICALLY TRANSFERRED FROM TIN OXALATE FOR FAST RESPONSE SENSORS TO TRACE FORMALDEHYDE

Keng Xu, Dawen Zeng

Huazhong University of Science and Technology, China

A3P-G9

OPERATING TEMPERATURE EFFECT IN WO₃ FILMS FOR GAS SENSING

Malcolm Govender¹, David Motaung¹, Bonex Mwakikunga¹, Siva Umapathy², Sanchita Sil², Arun K. Prasad³, Augusto Machatine⁴, Herbert Kurnert⁴

¹*Council for Scientific and Industrial Research, South Africa;* ²*Indian Institute of Science, India;* ³*Indira Gandhi Centre for Atomic Research, India;* ⁴*University of Pretoria, South Africa*

A3P-G10

RESPONSE ENHANCEMENT OF WO₃ GAS SENSORS BY METALLIC NANOGRAINS

Mehdi Othman^{1,3}, Dave Lollman¹, Khalifa Aguir¹, Philippe Ménini², Wajdi Belkacem³, Najeh Mliki³

¹*IM2NP, Aix Marseille Université, France;* ²*LAAS-CNRS, France;* ³*Université Tunis El Manar, Tunisia*

A3P-G11

METHODS FOR OPTIMIZING AND EXTENDING THE PERFORMANCE OF CHEMIREISTIVE GAS MICROSENSORS

Kurt D. Benkstein¹, Alexander Vergara¹, Christopher B. Montgomery¹, Steve Semancik¹, Baranidharan Raman²

¹*National Institute of Standards and Technology, United States;* ²*Washington University in St. Louis, United States*

A3P-G12

CHEMOSELECTIVE SENSOR DEVELOPMENT USING CARBON MEMS MICROSYSTEMS

Cody M. Washburn, Mike Rector, Patrick S. Finnegan, D. Bruce Burckel, Lee T. Massey, Greg V. White II, Robert Bernstein, Timothy N. Lambert

Sandia National Laboratories, United States

A3P-G13

ANALYSIS OF BIOLOGICAL AND ARTIFICIAL CHEMICAL SENSOR RESPONSES TO ODOR MIXTURES

Nalin Katta, Debajit Saha, Kevin Leong, Junnan Wu, Naveen Gandra, Wei-Ning Wang, Parag Banerjee, Srikanth Singamenni, Pratim Biswas, Baranidharan Raman

Washington University in St. Louis, United States

A3P-G14

FAST QUARTZ RESONANT METHOD FOR HIGH HUMIDITY MEASUREMENT

Jing Nie, Xiaofeng Meng

Beihang University, China

2:15 PM - 3:45 PM

A3P-H: BIOSENSORS I

Poster Area - Baltimore AB

Session Chairs: Yu-Cheng Lin (National Cheng Kung University, Taiwan)

A3P-H1

CHARACTERIZATION OF A NEEDLE-TYPE PROBE GMR SENSOR FOR BIOMEDICAL APPLICATIONS

Hamidreza Shirzadfar², Mustapha Nadi², Djilali Kourtiche², Sotoshi Yamada¹

¹Kanazawa University, Japan; ²Université de Lorraine – CNRS, France

A3P-H2

NON-CONTACT, CAPACITIVE BIOSENSOR ELECTRODES FOR ELECTROSTATIC CHARGE REDUCTION

Guochen Peng, Mark Sterling, Mark Bocko

University of Rochester, United States

A3P-H3

A GLUCOSE SENSOR WITH RELAY-RELEASED MECHANISM FOR LONG TIME GLUCOSE MONITORING

Lu Fang, Bo Liang, Qin Zhu, Bobo Huang, Xuesong Ye

ZheJiang University, China

A3P-H4

ELECTROWETTING ENABLED MAGNETIC PARTICLE IMMUNOASSAY WITH ON-CHIP MAGNETIC WASHING

Nikhil Bhalla^{1,3}, Wen Yaw Danny Chung¹, Kerwin Wang², Teddy Lessmana¹, Pedro Estrela³

¹Chung Yuan Christian University, Taiwan; ²National ChangHua University of Education, Taiwan; ³University of Bath, United Kingdom

A3P-H5

HIGH SENSITIVITY CMOS PORTABLE BIOSENSOR WITH FLEXIBLE MICROFLUIDIC INTEGRATION

Hasan Göktas, Mona Zaghloul

George Washington University, United States

A3P-H6

3 MM DEEP MICROELECTRODE NEEDLE ARRAY BASED ON ALUMINUM FOR NEURAL APPLICATIONS

Alexandre Peixoto¹, Beatriz Goncalves¹, Alexandre Silva¹, Nuno Dias^{1,2}, José Correia¹

¹University of Minho, Portugal; ²Polytechnic Institute of Cavado and the Ave, Portugal

A3P-H7

ORGANIC AND AQUEOUS DISPERSIBLE TETRAPODS FOR BIOSENSING APPLICATIONS

Mayur Sadawana, Arpit Katiyar, Roshni Ramachandran, Jayesh Bellare, Rohit Srivastava

Indian Institute of Technology Bombay, India

A3P-H8**FEMTO-MOLAR SENSITIVE FIELD EFFECT TRANSISTOR BIOSENSORS BASED ON SILICON NANOWIRES AND ANTIBODIES**

Francesca Puppo¹, Marie-Agnès Doucey³, Thomas Moh², Gregory Pandraud², Pasqualina M. Sarro², Giovanni De Micheli¹, Sandro Carrara¹

¹*École Polytechnique Fédérale de Lausanne, Switzerland;* ²*Delft University of Technology, Netherlands;* ³*Université de Lausanne, Switzerland*

A3P-H9**ELECTROCHEMICAL DETECTION OF DOPAMINE AT OXIDIZED POLYPYRROLE/GRAPHENE/AU ELECTRODE ARRAY**

Yuhua Yu, Jianfeng Chen, Guowei Tao, Jia Zhou
Fudan University, China

A3P-H10**REAL-TIME SENSING OF E.COLI BIOFILM GROWTH USING EPITAXIAL GRAPHENE**

Kevin Daniels, Nirupam Aich, Kristen Miller, Joseph Andrews, Shamaita Shetu, B. K. Daas, Tangali Sudarshan, Alan Decho, Navid Saleh, Mvs Chandrashekar

University of South Carolina, United States

A3P-H11**A PORTABLE IMPEDANCE BIOSENSOR FOR DETECTION OF MULTIPLE AVIAN INFLUENZA VIRUSES**

Benhua Zhang^{1,2}, Ronghui Wang¹, Yixiang Wang¹, Yanbin Li¹

¹*University of Arkansas, United States;* ²*Shenyang Agriculture University, United States*

A3P-H12**APPLICATION OF ION SENSITIVE FIELD EFFECT TRANSISTORS (ISFET) FOR ION CHANNEL DRUG DISCOVERY**

Yihao Zhu, Nicholas Deroller, Amol Singh, Ahsan Uddin, Kenneth Walsh, Goutam Koley

University of South Carolina, United States

A3P-H13**USING THE BIOSENSOR BASED ON IMPEDANCE MEASUREMENT AND SANDWICH IMMUNOASSAY FOR CARCINOEMBRYONIC ANTIGEN DETECTION**

Chia-Hsien Yeh², Kuan-Feng Su², Yu-Cheng Lin², Pi-Lan Shen¹

¹*Firststep Bioresearch, Inc., Taiwan;* ²*National Cheng Kung University, Taiwan*

A3P-H14**IN-VIVO SENSING OF GLUTAMATE LEVELS IN THE BASOLATERAL AMYGDALA ACROSS SLEEP-WAKE STATES**

Min Kim², Hargsoon Yoon², Laurie Wellman¹, Larry Sanford¹

¹*Eastern Virginia Medical School, United States;* ²*Norfolk State University, United States*

A3P-H15**COMPACT SILICON BIOSENSOR FOR THE CLINICAL RANGE ESTIMATION OF BLOOD SERUM TRIGLYCERIDE**

Mohanasundaram Sulur Veeramani, Noel Prashant Ratchagar, Enakshi Bhattacharya, Shanthy Pavan, Shyam Prakash, Anju Chadha
Indian Institute of Technology Madras, India

2:15 PM - 3:45 PM

A3P-J: PHYSICAL, INERTIAL & MAGNETIC SENSORS

Poster Area - Baltimore AB

Session Chairs: Joan Hoffmann (Johns Hopkins University, USA),
Tao Li (University of Michigan, USA)

A3P-J1**ENHANCED SENSITIVITY OF A NEW SURFACE ACOUSTIC WAVE BASED RATE SENSOR INCORPORATING METALLIC DOT ARRAYS**

Wen Wang, Xiuting Shao, Shitang He
Chinese Academy of Sciences, China

A3P-J2**NET-OVERHANG COUPLED MICROCANTILEVERS FOR SENSITIVE MASS DETECTION**

Guibing Cai, Rui Zhang, Zhiqiang Wang, Lurui Zhao, Wengang Wu
Peking University, China

A3P-J3**A RELATIVE GRAVIMETER FEATURING A SUPERCONDUCTING PLANAR SPRING AND THE ELECTROMAGNETIC LEVITATION**

Sang Woo Lee¹, Myeong-Jong Yu¹, Chan Seok Kang², In Sun Kim²
¹Agency for Defense Development, Korea, South; ²Korea Research Institute of Standards and Science, Korea, South

A3P-J4**MODAL COUPLING ERROR SUPPRESSION IN MICROMACHINED GYROSCOPES BY UV LASER TRIMMING**

Zhanqiang Hou, Xuezhong Wu, Dingbang Xiao, Songqi Hu, Xinghua Wang, Zhihua Chen
National University of Defense Technology, China

A3P-J5**SOFT-MATTER ELECTRONICS WITH STENCIL LITHOGRAPHY**

James Wissman, Tong Lu, Carmel Majidi
Carnegie Mellon University, United States

A3P-J6**A MINIATURIZED NON-RADIOACTIVE ELECTRON EMITTER INCLUDING A VACUUM PRESSURE GAUGE BASED ON ELECTRIC RETARDING FIELD ION CURRENTS**

Philipp Cochems, Daniel Mazarin, Stefan Zimmermann
Leibniz University Hannover, Germany

A3P-J7**MAGNETIC TUNNEL JUNCTION (MTJ) SENSORS FOR INTEGRATED CIRCUITS (IC) ELECTRIC CURRENT MEASUREMENT**

Maria-Dolores Cubells⁴, Càndid Reig⁴, Andrea De Marcellis³, Andrés Roldán², Juan-Bautista Roldán², Susana Cardoso¹, Paulo P. Freitas¹
¹INESC-MN, Portugal; ²University of Granada, Spain; ³University of L'Aquila, Italy; ⁴University of València, Spain

A3P-J8**A MICROMACHINED VIBRATING WHEEL GYROSCOPE WITH FOLDED BEAMS**

Qiancheng Zhao, Longtao Lin, Zhenchuan Yang, Liguang Dong, Guizhen Yan
Peking University, China

A3P-J9**MULTILAYER GIANT MAGNETO-IMPEDANCE SENSOR FOR LOW FIELD SENSING**

Saman Nazari Nejad, Arash Akhavan Fomani, Raafat Mansour
University of Waterloo, Canada

2:15 PM - 3:45 PM

A3P-K: OPTICAL SENSORS I

Poster Area - Baltimore AB

Session Chair: John X.J. Zhang (University of Texas at Austin, USA)

A3P-K1**C-REACTIVE PROTEIN APTASENSOR FOR EARLY SEPSIS DIAGNOSIS BY MEANS OF AN OPTICAL FIBER DEVICE**

Carlos Ruiz Zamarreño¹, Ignacio Ardaiz¹, Leyre Ruete¹, Francisco Muñoz^{1,2}, Ignacio Raul Matías¹, Francisco Javier Arregui¹
¹Public University of Navarra (UPNA), Spain; ²CSIC/GN, Spain

A3P-K2**LOW DRIFT AND HIGH RESOLUTION MINIATURE OPTICAL FIBER COMBINED PRESSURE- AND TEMPERATURE SENSOR FOR CARDIO-VASCULAR AND OTHER MEDICAL APPLICATIONS**

Sven Poeggel, Daniele Tosi, Gabriel Leen, Elfed Lewis
University of Limerick, Ireland

A3P-K3**PALM TOP WAVEGUIDE-MODE SENSOR: COMPARISON OF SENSITIVITY AND SUBTYPING OF INFLUENZA VIRUSES WITH SPR, ELISA AND IMMUNOCHROMATOGRAPHY**

Koichi Awazu, Makoto Fujimaki, Subash C.B. Gopinath
National Institute of Advanced Industrial Science and Technology (NIST), Japan

A3P-K4**MEASUREMENT OF PROJECTILE ATTITUDE ANGLES USING A LASER SCANNING SYSTEM**

Harbans Dhadwal, Jahangir Rastegar, Daichi Horimai, Neha Aggarwal
Omnitek Partners, LLC, United States

A3P-K5**IDENTIFICATION OF ADULTERATED VEGETABLE COOKING OILS USING FLUORESCENCE QUENCHING METHOD WITH AQUEOUS CTAB-COATED CDSE/ZNS QUANTUM DOTS AS PROBES**

Lizhou Xu³, Xiahong Xu³, Hua Xiong², Lingxin Chen¹, Yanbin Li^{3,4}

¹Chinese Academy of Sciences, China; ²Nanchang University, China;

³ZheJiang University, China; ⁴University of Arkansas, China

A3P-K6**HUMAN AND VEHICLE CLASSIFICATION USING A PYROELECTRIC INFRARED DETECTOR**

Dongfeng Xie, Baoqing Li, Qianwei Zhou, Enliang Song, Xiaobing Yuan

Shanghai Institute of Microsystem and Information Technology, China

A3P-K7**RAPID DETECTION OF ACRYLAMIDE IN FOOD USING A FLUORESCENT SENSING METHOD BASED ON FUNCTIONAL CDSE/ZNS QUANTUM DOTS**

Qinqin Hu¹, Xiahong Xu¹, Zhanming Li¹, Ying Zhang¹, Jianping Wang¹, Yanbin Li^{1,2}

¹Zhejiang University, China; ²University of Arkansas, United States

A3P-K8**DETECTION OF HOGWASH OIL IN CHINESE SOYBEAN OILS USING DUAL-BAND ABSORPTION MEASUREMENTS**

Anna Grazia Mignani¹, Leonardo Ciaccheri¹, Andrea Azelio

Mencaglia¹, Jian Xing², Xing-Hua Yang², Weimin Sun², Libo Yuan²

¹CNR Istituto di Fisica Applicata "Nello Carrara", Italy; ²Harbin Engineering University, China

A3P-K9**ADVANCED PLANAR-OPTICAL SPR BASED BIOSENSOR USING MAGNETIC-DIELECTRIC CORE-SHELL-PARTICLES AS MOBILE SUBSTRATE**

Toni Haugwitz, Niels Neumann, Tobias Schuster, Dirk Plettemeier
Technische Universität Dresden, Germany

A3P-K10**NOVEL FIBER-OPTIC PROBE BASED ON SINGLE-MULTI-MODE FIBER COUPLER FOR FLUORESCENCE DETECTION**

Feng Long¹, Anna Zhu², Hanchang Shi²

¹Renmin University of China, China; ²Tsinghua University, China

A3P-K11**DISPOSABLE AND MINIMAL INVASIVE OPTICAL FIBER SENSORS FOR THE MEASUREMENT OF PH AND DISSOLVED OXYGEN**

N. Deepa, U.V. Dharani Kumar, A. Balaji Ganesh

Velammal Engineering College, India

A3P-K12**SELECTIVITY AND REUSABILITY STUDY OF FUNCTIONALIZED ALD TiO2 EVANESCENT WAVE SENSORS**

Agung Purniawan, Paddy French, Marinka Almering, Gregory Pandraud, Pasqualina M. Sarro

Delft University of Technology, Netherlands

2:15 PM - 3:45 PM

A3P-L: SENSOR/ACTUATOR SYSTEMS

Poster Area - Baltimore AB

Session Chair: Gijs Krijnen (University of Twente, MESA+ Research Institute, The Netherlands)

A3P-L1

A LOW-POWER NEUROMORPHIC CMOS SENSOR CIRCUIT FOR THE IMPLANTED BIOMOLECULAR DETECTIONS

Yang-Guo Li, Mohammad Haider

University of Alabama at Birmingham, United States

A3P-L2

CONTACT SENSING IN A BIO-INSPIRED WHISKER DRIVEN BY ELECTROACTIVE POLYMER ARTIFICIAL MUSCLES

Tareq Assaf, Jonathan Rossiter, Martin Pearson

University of Bristol and University of West of England, United Kingdom

A3P-L3

INTEGRATED ELECTROCHEMICAL SENSOR BASED ON ELECTROWETTING-ON-DIELECTRIC MICROFLUIDIC CHIP

Jianfeng Chen, Yuhua Yu, Jia Zhou

Fudan University, China

A3P-L4

A NOVEL APPROACH FOR DROPLET POSITION SENSING IN ELECTROWETTING DEVICES

Shiraz Sohail, Karabi Biswas

Indian Institute of Technology, India

A3P-L5

TEST AND EVALUATION OF A SILICON RESONANT ACCELEROMETER IMPLEMENTED IN SOI TECHNOLOGY

Guo-ming Xia, An-ping Qiu, Qin Shi, Yan Su

Nanjing University of Science and Technology, China

A3P-L6

DEVELOPMENT OF A TRI-AXIS VORTEX CONVECTIVE GYROSCOPE WITH SUSPENDED SILICON THERMISTORS

Honglong Chang, Pingwei Zhou, Xianghui Gong, Jianbing Xie, Weizheng Yuan

Northwestern Polytechnical University, China

A3P-L7

NANO-PRECISION FORCE AND DISPLACEMENT MEASUREMENTS USING MEMS RESONANT STRUCTURES

Emad Mehdizadeh², Xiaobo Guo², Siavash Pourkamali², Arash Hajjam¹, Amir Rahafrooz¹

¹University of Denver, United States; ²University of Texas at Dallas, United States

A3P-L8

QUANTUM DOTS/POLYMER COMPOSITE SYSTEM FOR TURN-ON FLUORESCENT DETECTION OF PEROXIDE HYDROGEN

Defeng Zhu, Kangyi Hua, Qingguo He, Jiangong Cheng, Huimin Cao, *Chinese Academy of Sciences, China*

A3P-L9**SHAPED COMBS AND PARAMETRIC AMPLIFICATION IN INERTIAL MEMS SENSORS**

Mrigank Sharma, Elie Hanna Sarraf, Edmond Cretu
University of British Columbia, Canada

A3P-L10**A TUNABLE HIGH PERFORMANCE MICROWAVE EQUALIZER BASED ON RF MEMS SWITCHES**

Lei Han, Wen Jiang, Yan-Qing Zhu, Ming-Xia Jiang
Southeast University, China

A3P-L11**A ROBUST AND RELIABLE RF-MEMS SWITCH FABRICATED THANKS TO AN ORIGINAL DIELECTRIC FREE DESIGN AND AN INNOVATIVE PROCESS FLOW**

Frederic Souchon¹, Bruno Reig¹, Christel Dieppedale¹, Henri Sibuet¹, Benjamin Blampey², Jean-Marc Duchamp²
¹CEA-LETI, MINATEC Campus, France; ²Grenoble INP, MINATEC Campus, France

A3P-L12**OPEN CAVITY SENSORS FOR ATTITUDE CONTROL USING A SCANNING REFERENCE SOURCE**

Harbans Dhadwal, Jahangir Rastegar
Omnitek Partners, LLC, United States

A3P-L13**MULTILAYER SAW DEVICE FOR FLOW RATE SENSING IN A MICROFLUIDIC CHANNEL**

Bui Thu Hang, Chu Duc Trinh
Vietnam National University, Vietnam

A3P-L14**3D PRINTED CAPACITIVE SENSORS**

Corey Shemelya, Fernando Cedillos, Efrain Aguilera, Elaine Maestas, Jorge Ramos, David Espalin, Dan Muse, Ryan Wicker, Eric Macdonald
University of Texas at El Paso, United States

A3P-L15**A NEW CIRCUITAL SOLUTION FOR POWER HARVESTING FROM RANDOM AND LOW-AMPLITUDE VOLTAGES BY USING BISTABLE MECHANICAL SWITCH**

Fabio Giusa, Carlo Trigona, Bruno Andò, Salvatore Baglio
Università degli Studi di Catania, Italy

A3P-L16**NOVEL SWITCHED CAPACITOR (SC) APPROACH BASED ON THE BISTABLE MECHANICAL SWITCHES**

Alessio Noto, Carlo Trigona, Bruno Andò, Salvatore Baglio
Università degli Studi di Catania, Italy

A3P-L17**A 0.85%-PRECISION, 6-DECADE-RANGE, I2C -PROGRAMMABLE FRONT-END ASIC FOR RESISTIVE GAS-SENSOR ARRAYS WITH 20-INPUT ANALOG MUX, DIGITAL OUTPUT, AND 1.5°C-ACCURACY DYNAMIC TEMPERATURE SYNTHESIS**

Fabrizio Conso², Marco Grassi², Claudio De Berti², Piero Malcovati², Andrea Baschiroto¹

¹University of Milano - Bicocca, Italy; ²University of Pavia, Italy

A3P-L18**ELECTRICAL CHARACTERIZATION OF 26 X 26 GROUND REACTION SENSOR ARRAY INTERFACED WITH TWO PARALLEL ELECTRONIC DETECTION CHANNELS**

Qingbo Guo, Rajesh Surapaneni, Yu-Pin Hsu, Carlos Mastrangelo, Darrin Young

University of Utah, United States

A3P-L19**A NOVEL SELF-CHARGING CAPACITIVE DETECTION SCHEME FOR MEMS SENSORS WITH IMPROVED TEMPERATURE ROBUSTNESS**

Dingbang Xiao, Xinghua Wang, Zhihua Chen, Xuezhong Wu, Zhanqiang Hou

National University of Defense Technology, China

A3P-L20**TORWARDS A FULLY-INTEGRATED CMOS MICROCALORIMETER WITH ON-CHIP QUASI-DIGITAL OUTPUT SIGNAL**

Francisco Muñoz-Contreras², Jaume Verd², Jaume Segura², Arantxa Uranga¹, Martí Riverola¹, Núria Barniol¹

¹Universitat Autònoma de Barcelona, Spain; ²Universitat de les Illes Balears, Spain

A3P-L21**CAPACITIVE CONTROL OF AN ISFET USING DIELECTRIC COATED ELECTRODES**

Philip Gordon, Krishna Jayant, Joshua Phelps, Edwin Kan

Cornell University, United States

A3P-L22**A CO-PLANAR, NEAR FIELD COMMUNICATION TELEMETRY LINK FOR A FULLY-IMPLANTABLE GLUCOSE SENSOR USING HIGH PERMEABILITY FERRITES**

Szymon Tankiewicz, Joshua Schaefer, Andrew Dehennis

Senseonics, Incorporated, United States

A3P-L23**MINIATURIZED LOW COST WIRELESS DATA LOGGER FOR VIBRATION RECORDING OF PHYSIOLOGICAL ACTIVITIES**

Issa Jaafar, Zachary Czarnecki

Assiniboine Community College, Canada

A3P-L24**NONINVASIVE CHARACTERIZATION OF GLUCOSE AQUEOUS SOLUTIONS BASED ON CONTINUOUS-WAVE PHOTOACOUSTIC TECHNIQUES: A PHANTOM-BASED APPROACH**

Serge Camou, D. Stevens, Y. Higuchi, H. Koizumi
NTT Corp., Japan

A3P-L25**NONLINEAR MECHANICAL SENSITIVITY OF UN-SYMMETRICALLY LAYERED AND PRE-STRESSED PIEZOELECTRIC PLATE IN LARGE DEFLECTION DUE TO LATERAL LOAD**

Chun-Fu Chen, I-Wei Li
Chung-Hua University, Taiwan

2:15 PM - 3:45 PM

A3P-M: OTHER SENSORS TOPICS I

Poster Area - Baltimore AB

Session Chairs: Christopher Salthouse (University of Massachusetts, Amherst, USA), Kenichi Takahata (University of British Columbia, Canada)

A3P-M1**DESIGN OF A DUAL-MODE 1.8 V 62 UW CMOS SENSOR INTERFACE FOR INKJET-PRINTED SENSOR**

Shenjie Wang, Francisco Molina-Lopez, Kerem Kapucu, Danick Briand, Catherine Dehollain
École Polytechnique Fédérale de Lausanne, Switzerland

A3P-M2**BIO-MIMETIC STRATEGIES FOR TACTILE SENSING**

Wang Wei Lee, John-John Cabibihan, Nitish Thakor
National University of Singapore, Singapore

A3P-M3**SMART IMAGE SENSING SYSTEM**

Jie Yang, Cong Shi, Zhongxiang Cao, Ye Han, Liyuan Liu, Nanjian Wu
Chinese Academy of Sciences, China

A3P-M4**A READOUT CIRCUIT FOR WIRELESS PASSIVE RESONANT-CIRCUIT SENSORS**

Kaikai Bao, Deyong Chen, Qiang Shi, Jian Chen, Junbo Wang
Chinese Academy of Sciences, China

A3P-M5**IMPROVING ENERGY EFFICIENCY IN SENSING SUBSYSTEMS VIA NEAR-THRESHOLD COMPUTING AND DEVICE AGING**

James Bradley Wendt, Miodrag Potkonjak
University of California, Los Angeles, United States

A3P-M6**DIAGNOSIS SENSOR FUSION FOR WIRE FAULT LOCATION IN CAN BUS SYSTEMS**

Wafa Ben Hassen¹, Fabrice Auzanneau¹, François Pérès², Ayeley Tchangani²

¹CEA- LIST, France; ²Université de Toulouse, France

A3P-M7**SIMULATION OF THE BOSCH PROCESS WITH THE NARROW BAND LEVEL SET METHOD**

Bei Chen, Zai-Fa Zhou, Xiaoqian Li, Qing-An Huang
Southeast University, China

A3P-M8**ERROR MODEL FOR A SENSOR INTERFACE SYSTEM BASED ON THE 1ST ORDER DELTA-SIGMA MODULATOR DUE TO THE NONLINEARITY OF THE SENSOR**

Tommy Halim, Karsten Leitis
Technische Hochschule Mittelhessen, Germany

A3P-M9**MILLIMETER-WAVE INTERFEROMETRIC IMAGING SENSORS**

Jeffrey Nanzer
Johns Hopkins University, United States

A3P-M10**INTEGRATED SENSOR FOR SINGLE-PHOTON READOUT OF AVALANCHE DIODES IN STANDARD CMOS**

Babak Nouri, Pamela Abshire
University of Maryland, United States

A3P-M11**PULSE WIDTH MODULATION CIRCUIT FOR ISFET DRIFT RESET**

Sahil Shah, Jennifer Blain Christen
Arizona State University, United States

A3P-M12**A MIXED-SIGNAL LOW-COMPLEXITY CIRCUIT FOR ON-SENSOR COMPRESSION**

Suvradip Ghosh², Hsuan-Tsung Wang², Walter Leon-Salas¹
¹*Purdue University, United States*; ²*University of Missouri-Kansas City, United States*

A3P-M13**CMOS POTENTIOSTAT FOR CHEMICAL SENSING APPLICATIONS**

Tao Luo¹, Hongyi Wang², Hongjiang Song¹, Jennifer Blain Christen¹
¹*Arizona State University, United States*; ²*Xi'an Jiaotong University, China*

A3P-M14**A LOW-POWER, LOW-NOISE BIOINSPIRED BANDPASS BIOPOTENTIAL AMPLIFIER-FILTER BANK FOR IMPLANTABLE BIO-SENSOR**

Qingyun Ma, Mohammad Haider
University of Alabama at Birmingham, United States

A3P-M15**FABRICATION OF Z-AXIS ACCELEROMETER WITH GALVANIC ETCH STOP AND ANTIFUSE ISOLATION**

Xiang Jiang, Heng Yang, Yanhong Wu, Xinxin Li, Yuelin Wang
Chinese Academy of Sciences, China

A3P-M16

**A TWO-DIMENSIONAL ULTRASONIC TRANSDUCER HAVING
PLANAR BACKING ARRAY ELECTRODES**

Chang-Geun Ahn, Inbum Lee, Hyungwook Noh, Sooyeul Lee, Won Ick
Jang, Bong Kyu Kim

Electronics and Telecommunications Research Institute, Korea, South

A3P-M17

**DESIGN OF CMOS CAPACITANCE TO FREQUENCY CONVERTER
FOR HIGH-TEMPERATURE MEMS SENSORS**

Yucai Wang, Vamsy Chodavarapu

McGill University, Canada

3:45 PM - 5:00 PM

A4L-A: GAS SENSORS II

Maryland F

Session Chairs: Hong Yu (Arizona State University, USA), Dae-sik Lee (ETRI, South Korea)

3:45 PM

DETECTING TRACE-LEVEL CONCENTRATIONS OF VOLATILE ORGANIC COMPOUNDS WITH METAL OXIDE GAS SENSORS

Marco Schüller², Nikolai Helwig², Andreas Schütze², Tilman Sauerwald², Gabriela Ventura¹

¹Universidade do Porto, Portugal; ²Saarland University, Germany

4:00 PM

DESIGNING CHEMICALLY SELECTIVE MICROSENSOR ARRAYS USING IONIC LIQUID DOPED IONOMERS

Hwall Min, Gokhan Hatipoglu, Srinivas Tadigadapa
Pennsylvania State University, United States

4:15 PM

CAVITY-ENHANCED MID-INFRARED ON-CHIP CHEMICAL SENSING USING HIGH-Q CHALCOGENIDE GLASS RESONATORS

Hongtao Lin², Yesh Chillakuru², Kati McLaughlin², Lan Li², Yi Zou², Fei Deng², Chaoying Ni², Sylvain Danto¹, J. David Musgraves³, Kathleen Richardson¹, Juejun Hu²

¹University of Central Florida, United States; ²University of Delaware, United States, ³IRradiance Glass Inc, United States

4:30 PM

DETECTING VOLATILE ORGANIC COMPOUNDS IN THE PPB RANGE WITH PLATINUM-GATE SIC-FIELD EFFECT TRANSISTORS

Christian Bur¹, Mike Andersson¹, Anita Lloyd Spetz¹, Nikolai Helwig², Andreas Schütze²

¹Linköping University, Sweden; ²Saarland University, Germany

4:45 PM

LOVE WAVE SENSOR BASED ON THIN FILM MOLECULARLY IMPRINTED POLYMER : MIP LAYER MORPHOLOGY AND NUCLEOSIDES ANALOGS DETECTION

Nima Omar-Aouled¹, Hamida Hallil¹, Bernard Plano¹, Dominique Rebière¹, Corinne Dejous¹, Raphael Delépée², Luigi Agrofoglio²

¹Université Bordeaux, France; ²University of Orléans, France

3:45 PM - 5:00 PM

A4L-B: BIOMOLECULAR

Maryland E

Session Chairs: Xinxin Li (Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China), Alper Bozkurt (North Carolina State University, USA)

3:45 PM

A MICROFLUIDIC NANOSTRUCTURED FLUORESCENCE SENSOR FOR BIOMOLECULAR BINDING DETECTION

Xiang Li, Haocheng Yin, Long Que
Louisiana Tech University, United States

4:00 PM

A MICROFLUIDIC SENSOR OF BOTULINUM NEUROTOXIN TYPE A UTILIZING SNAP-25 INCORPORATED RESPONSIVE HYDROGEL

Xiudong Wu, Chensha Li, Xuezhen Huang, Hongrui Jiang, Guangyun Lin, William Tepp, Eric A. Johnson

University of Wisconsin-Madison, United States

4:15 PM

FLUORESCENT IMMUNOASSAY SYSTEM

Xiaoqun Zhou¹, Weihua Hu², Changming Li²

¹*Institute for Infocomm Research, Singapore;* ²*Nanyang Technological University, Singapore*

4:30 PM

DIRECT VISUALIZATION OF ELECTROGENIC BACTERIA IN A MICROFABRICATED MICROBIAL FUEL CELL

Chunhui Dai, Simeng Chen, Arwa Fraiwan, Seokheun Choi

State University of New York - Binghamton, United States

4:45 PM

AN AUTOMATED MINIATURIZED CREATININE SENSING SYSTEM

Son Lai, David Gaddes, Srinivas Tadigadapa

Pennsylvania State University, United States

3:45 PM - 5:00 PM

A4L-C: MAGNETIC SENSORS

Maryland A

Session Chairs: Oliver Brand (Georgia Institute of Technology USA), Jürgen Kosel (King Abdullah Univ. of Science & Technology, Saudi Arabia)

3:45 PM

FULLY SYMMETRIC VERTICAL HALL DEVICES IN CMOS TECHNOLOGY

Christian Sander², Roiy Raz², Patrick Ruther², Oliver Paul², Timo Kaufmann¹, Martin Cornils¹, Maria-Cristina Vecchi¹

¹*Micronas GmbH, Germany;* ²*IMTEK, Germany*

4:00 PM

DUAL-CORE FLUXGATE GRADIOMETER WITH GRADIENT FEEDBACK

Michal Janosek², Antonin Platil², Jan Vyhnánek², Jan Brínek¹

¹*Czech Space Research Centre Ltd., Czech Rep.;* ²*Czech Technical University in Prague, Czech Rep.*

4:15 PM

MAGNETIC FLUX MODULATION WITH A PIEZOELECTRIC SILICON BRIDGE FOR 1/F NOISE REDUCTION IN MAGNETORESISTIVE SENSORS

Jiafei Hu, Wugang Tian, Hongfeng Pang, Jianqiang Zhao, Wenyin Li, Dixiang Chen, Mengchun Pan

National University of Defense Technology, China

4:30 PM

AMR PROXIMITY SENSOR WITH INHERENT DEMODULATION

Pavel Ripka, Jan Vyhnánek, Michal Janosek, Jan Vcelák

Czech Technical University, Czech Republic

4:45 PM

OPTIMIZATION OF LORENTZ-FORCE MEMS MAGNETOMETERS USING RAREFIED-GAS-THEORY

Attilio Frangi¹, Biagio De Masi¹, Giacomo Langfelder¹, Dario Paci²
¹Politecnico di Milano, Italy; ²ST Microelectronics, Italy

3:45 PM - 5:00 PM

A4L-D: OPTICAL SENSORS FOR CHEMICAL ANALYSES

Maryland D

Session Chairs: Ignacio R. Matias (Universidad Publica de Navarra, Spain), Anna G. Mignani (CNR IFAC, Italy)

3:45 PM

HIGH SENSITIVITY OPTICAL FIBER PH SENSOR USING POLY(ACRYLIC ACID) NANOFIBERS

Jesus Corres², Francisco Javier Arregui², Ignacio Raul Matías², Yoany Rodríguez¹
¹University of Pinar del Rio, Cuba; ²Public University of Navarra, Spain

4:00 PM

GRAVURE PRINTED PAPER BASED SUBSTRATE FOR DETECTION OF HEAVY METALS USING SURFACE ENHANCED RAMAN SPECTROSCOPY (SERS)

Ali Eshkeiti, Morteza Rezaei, Binu Baby Narakathu, Sai Guruva Reddy Avuthu, Sepehr Emamian, Massood Zandi Atashbar
Western Michigan University, United States

4:15 PM

RAMAN PROBE FOR THE SIMULTANEOUS MEASUREMENT OF ANION CONCENTRATION IN MIXTURES OF SALT SOLUTIONS

Thomas H. Kauffmann, Kawther Ben Mabrouk, Marc D. Fontana
University of Lorraine and Supélec, France

4:30 PM

OPTIMIZING SENSOR DESIGN FOR POLYMER FIBRE OPTIC OXYGEN SENSORS

Rongsheng Chen², Hanne McPeak², Federico Formenti², Clive Hahn², Andrew Farmery², Andrew Obeid¹
¹Oxford Optronix Ltd, United Kingdom; ²University of Oxford, United Kingdom

4:45 PM

MICROFLUIDIC OPTOELECTRONIC SENSOR ARRAY FOR DETECTION OF DISSOLVED CO₂ BASED ON HALOCROMIC DYE-DOPED POLYMERIC MICROBEADS

Yael Zilberman, Shideh Kabiri Ameri, Sameer Sonkusale
Tufts University, United States

3:45 PM - 5:00 PM

A4L-E: ACTUATOR SYSTEMS

Watertable ABC

Session Chairs: Gijs Krijnen (University of Twente, MESA+ Research Institute, The Netherlands), Oliver Paul (University of Freiburg - IMTEK, Germany)

3:45 PM

INVITED TALK: CMUT BASED CHEM/BIO SENSORS

Pierre Khuri-Yakub
Stanford University, United States

4:15 PM

MAGNETIC CIRCUITS BASED ON POLYMER COMPOSITES FOR CONTROLLED ACTUATION OF A FERROMAGNETIC SPHERE AT A MICROFLUIDIC JUNCTION

Wolfgang Hilber, Stefan Clara, Bernhard Jakoby
Johannes Kepler University Linz, Austria

4:30 PM

SMART PNEUMATIC ARTIFICIAL MUSCLE ACTUATOR WITH EMBEDDED MICROFLUIDIC SENSING

Yong-Lae Park¹, Robert Wood²
¹*Carnegie Mellon University, United States;* ²*Harvard University, United States*

4:45 PM

A NOVEL LOW-VOLTAGE LARGE-DISPLACEMENT BULK SILICON COMB-DRIVE ACTUATOR BASED ON POST-CMOS PROCESS

Chun-Hua Cai, Ming Qin
Southeast University, China

3:45 PM - 5:00 PM

A4L-F: MATERIALS & FABRICATION I

Homeland

Session Chairs: Eric Johnson (Clemson University, USA), Long Que (Louisiana Tech University, USA)

3:45 PM

INVITED TALK: MICROSYSTEMS FOR SENSING AND CHARACTERIZATION OF BACTERIAL BIOFILMS

Reza Ghodssi, Mariana T. Meyer, Young W. Kim
University of Maryland, United States

4:15 PM

MICROFABRICATION OF CAPACITIVE PRESSURE SENSORS USING FERROFLUID SACRIFICIAL LAYERS

Babak Assadsangabi, Xing Chen, Daniel Brox, Kenichi Takahata
University of British Columbia, Canada

4:30 PM

APPLICATION OF AEROSOL JET TECHNOLOGY IN THROUGH-VIA METAL INTERCONNECTION FOR MEMS WAFER-LEVEL PACKAGING

Zhan Zhan, Mengyue Chen, Lingke Yu, Xiaochun Qiu, Jin Wei, Xiaoping Wang, Daoheng Sun, Lingyun Wang
Xiamen University, China

4:45 PM

HOMOGENEOUS AND SHARP SI NANOPROBE ARRAY FABRICATED ON (111) SILICON WAFER

Xiao Zhang, Xiao Yu, Yi Wang, Tie Li, Yuelin Wang
Chinese Academy of Sciences, China

TUESDAY, NOVEMBER 5TH

8:00 AM - 9:00 AM

**Plenary – KEYNOTE – PROFESSOR ROBERT PUERS:
IMPLANTABLE CHIPS & SENSORS: QUO VADIS?**

Maryland BC

Session Chair: Robert Trew (North Carolina State University, USA)

8:00 AM

IMPLANTABLE CHIPS AND SENSORS: QUO VADIS?

Robert Puers

KULeuven, ESAT-MICAS, Belgium

9:00 AM - 10:15 AM

B1L-A: HUMIDITY SENSORS

Maryland F

Session Chair: Zheyao Wang (Tsinghua University, China)

9:00 AM

**ELECTRICAL AND HUMIDITY-SENSING CHARACTERIZATION OF
INKJET-PRINTED MULTI-WALLED CARBON NANOTUBES FOR
SMART PACKAGING**

Yi Feng¹, Li Xie¹, Matti Mäntysalo², Qiang Chen¹, Li-Rong Zheng^{1,3}

¹Royal Institute of Technology, Sweden; ²Tampere University of Technology, Finland; ³State Key Lab of ASICs and Systems, ICT School, China

9:15 AM

**INKJET PRINTED HUMIDITY THRESHOLD MONITORING SENSOR
SOLUTION WITH IRREVERSIBLE RESISTANCE CHANGE FOR
PASSIVE RFID APPLICATIONS**

Sebastian Sauer², Alexander Türke², Andreas Weder¹, Wolf-Joachim Fischer¹

¹Fraunhofer IPMS, Germany; ²Technische Universität Dresden, Germany

9:30 AM

**THE OPTIMIZED SAW HUMIDITY SENSOR WITH NANOFILMS OF
GRAPHENE OXIDE**

Sergey Balashov, Olga Balachova, Ana Valéria Braga, Maria Cecilia Bazetto, Aristides Pavani Filho

Center for Information Technology Renato Archer - CTI, Brazil

9:45 AM

**FULLY PRINTED ORGANIC THIN FILM TRANSISTORS (OTFT)
BASED FLEXIBLE HUMIDITY SENSORS**

Sai Guruva Reddy Avuthu, Binu Baby Narakathu, Ali Eshkeiti, Bradley Bazuin, Margaret Joyce, Massood Zandi Atashbar

Western Michigan University, United States

10:00 AM

**SENSITIVITY, SELECTIVITY AND NANO-DIMENSIONAL EFFECTS
IN GOLD NANOCUSTER VAPOR SENSORS**

Arthur Snow, Mario Ancona

Naval Research Laboratory, United States

9:00 AM - 10:15 AM

B1L-B: INTERFACE

Maryland E

Session Chairs: Tony Jun Huang (Pennsylvania State University, USA), Joannis Raptis (NCSR Demokritos, Greece)

9:00 AM

CHANNEL LENGTH DEPENDENT SENSOR RESPONSE OF SCHOTTKY-BARRIER FET PH SENSORS

Sebastian Pregl^{1,2}, Felix Zörgiebel², Larysa Baraban², Gianarelio Cuniberti², Thomas Mikolajick^{1,2}, Claudia Richter¹, Walter Weber¹

¹Namlab GmbH, Germany; ²Technische Universität Dresden, Germany

9:15 AM

THE DNA TRANSISTOR INTERFACE: THE INTERPLAY BETWEEN PH, ELECTRIC FIELD AND MEMBRANE SCREENING DICTATES SENSITIVITY

Krishna Jayant, Kshitij Auluck, Edwin Kan

Cornell University, United States

9:30 AM

A MICRO-FABRICATED NON-ENZYMATIC URINE GLUCOSE SENSOR USING NAFION COATED NANOPOROUS PT COMPOSITE ELECTRODES

Su Jin Lee, Yijae Lee, Jae Young Park

Kwangwoon University, Korea, South

9:45 AM

MAMMARY CANCER CELL MANIPULATION WITH EMBEDDED PASSIVATED-ELECTRODE INSULATOR-BASED DIELECTROPHORESIS (EPIDEP)

Tyler Shake, Vaishnavi Srinivasaraghavan, Phillip Zellner, Masoud Agah

Virginia Tech, United States

10:00 AM

THREE STAGE SAMPLE PREPARATION FOR PURIFICATION OF PROTEINS FROM COMPLEX BIOLOGICAL SAMPLES

Mehdi Javanmard, Sam Emaminejad, Ron Davis, Chaitanya Gupta, Roger Howe

Stanford University, United States

9:00 AM - 10:15 AM

B1L-C: ACOUSTIC SENSORS

Maryland A

Session Chairs: Geoffrey Cranch (Naval Research Laboratory, USA), Gijs Krijnen (University of Twente, MESA+ Research Institute, The Netherlands)

9:00 AM

A THREE PZT SETUP FOR DETERMINING PHYSICAL LIQUID PROPERTIES UTILIZING ACOUSTIC PRESSURE WAVES

Hannes Antlinger¹, Stefan Clara¹, Bernhard Jakoby¹, Roman Beigelbeck², Samir Cerimovic², Franz Keplinger²

¹Johannes Kepler University, Austria; ²Vienna University of Technology, Austria

9:15 AM

**A TWO-STAGE AEROSOL IMPACTOR WITH EMBEDDED MEMS
RESONANT MASS BALANCES FOR PARTICULATE SIZE
SEGREGATION AND MASS CONCENTRATION MONITORING**

Emad Mehdizadeh², Varun Kumar², Siavash Pourkamali², Jonathan
Gonzales¹, Reza Abdolvand¹

¹Oklahoma State University, United States; ²University of Texas at
Dallas, United States

9:30 AM

**A CROSSED-WIRE 2-DIMENSIONAL ACOUSTIC PARTICLE
VELOCITY SENSOR**

Olti Pjetri, Remco J Wiegerink, Theo S. J Lammerink, Gijs J.M Krijnen
University of Twente, Netherlands

9:45 AM

**DUAL HIGH-FREQUENCY SURFACE ACOUSTIC WAVE
RESONATOR FOR ULTRAFINE PARTICLE SENSING**

Sanju Thomas, Zoltán Rácz, Marina Cole, Julian Gardner
University of Warwick, United Kingdom

10:00 AM

**MINIATURIZATION OF ACOUSTIC VECTOR SENSORS ENABLED
BY VISCOUS FLUIDS: TOWARDS FIBER LASER HAIR SENSORS**

Janet Lou¹, Geoffrey Cranch², Gary Miller², Clay Kirkendall²

¹Sotera Defense Solutions, Inc., United States; ²US Naval Research
Laboratory, United States

9:00 AM - 10:15 AM

B1L-D: ELECTROMAGNETIC SENSORS & PHENOMENA

Maryland D

Session Chair: Harrie Tilmans (Imec, Belgium)

9:00 AM

**INVITED TALK: MULTI-SENSOR DATA INTEGRATION FOR
PERSONAL NAVIGATION**

Tamal Mukherjee

Carnegie Mellon University, United States

9:30 AM

**NUMERICAL MODELING OF THE ELECTROMAGNETIC
COUPLING EFFECTS FOR PHASE ERROR CORRECTION IN EIT
BOREHOLE MEASUREMENT**

Yulong Zhao¹, Egon Zimmermann¹, Sander Huisman¹, Andrea
Treichel¹, Bernd Wolters¹, Stefan van Waasen¹, Andreas Kemna²

¹Forschungszentrum Jülich GmbH, Germany; ²University of Bonn,
Germany

9:45 AM

**ASSESSMENT OF THE SPINNING-CURRENT EFFICIENCY IN
CANCELLING THE 1/F NOISE OF VERTICAL HALL DEVICES
THROUGH ACCURATE FEM MODELING**

Morgan Madec, Laurent Osberger, Luc Hébrard

University of Strasbourg - CNRS, France

10:00 AM

THE MULTIPOLE RESONANCE PROBE: EVOLUTION OF A PLASMA SENSOR

Christian Schulz, Ilona Rolfes, Tim Styrnoll, Peter Awakowicz, Jens Oberrath, Thomas Mussenbrock, Ralf Peter Brinkmann, Robert Storch, Thomas Musch

Ruhr-University Bochum, Germany

9:00 AM - 10:15 AM

**B1L-E: WIRELESS SENSOR NETWORKS FOR HEALTH I
Watertable ABC**

Session Chair: Tracie Severson (US Naval Academy, USA)

9:00 AM

INVITED TALK: IN-SITU SOIL MOISTURE SENSING: FROM PHYSICAL MODELS TO OPTIMAL CONTROL TO SYSTEM DEPLOYMENT

Mingyan Liu

University of Michigan, United States

9:30 AM

WIDE AND HIGH ACCESSIBLE MOBILE HEALTHCARE SYSTEM IN IP-BASED WIRELESS SENSOR NETWORKS

Sang-Joong Jung, Wan-Young Chung

Pukyong National University, Korea, South

9:45 AM

RECONFIGURABLE DIFFERENTIAL ACCELEROMETER PLATFORM FOR INERTIAL BODY SENSOR NETWORKS

Jiaqi Gong, John Lach

University of Virginia, United States

10:00 AM

A NON-CONTACT WEARABLE WIRELESS BODY SENSOR NETWORK FOR MULTIPLE VITAL SIGNAL DETECTION

Ye Sun, Junliang Tao, Guangxi Wu, Xiong Yu

Case Western Reserve University, United States

9:00 AM - 10:15 AM

**B1L-F: INDUSTRIAL & ENVIRONMENTAL
Homeland**

Session Chair: Thilo Sauter (Danube University Krems, Austria)

9:00 AM

A PORTABLE MULTI-MEGABIT OPTICAL FIBRE SONAR SENSOR SYSTEM

Ching Man¹, Brian Moss¹, Elfed Lewis³, Rodney Coates²

¹Analog Devices, Ireland; ²Seiche Ltd, United Kingdom; ³University of Limerick, Ireland

9:15 AM

LARGE ANIMAL DETECTION AND CONTINUOUS TRAFFIC MONITORING ON HIGHWAYS

Abir Mukherjee, Svetlana Stolpner, Xia Liu, Ulsi Vrenozaj, Chuhong Fei, Abhijit Sinha

A.U.G. Signals Ltd., Canada

9:30 AM

SYSTEM FOR OXYGEN MEASUREMENTS IN A FISH FARM

Ruby Ghosh, Reza Loloee

Michigan State University, United States

9:45 AM

MEMS HARSH ENVIRONMENT SENSOR ARRAY-ENABLED HOT SPRING MAPPING

Jonathon Oiler, Everett Shock, Hilairy Hartnett, Hongyu Yu

Arizona State University, United States

10:00 AM

A MEASURING METHOD FOR THE MASS FLOW DETERMINATION IN A PNEUMATIC CONVEYING SYSTEM

Christoph Baer², Philipp Mertmann², Thomas Musch², Timo Jaeschke², Nils Pohl¹

¹*Fraunhofer FHR, Germany;* ²*Ruhr-University Bochum, Germany*

10:45 AM - 12:00 PM

B2L-A: LIQUID BASED SENSORS

Maryland F

Session Chair: James Stephen (Cranfield University, UK)

10:45 AM

MEMS BASED MICROSTRUCTURE ARRAY DESIGN AND ITS QUANTITATIVE ANALYSIS OF MICROPRECONCENTRATOR FOR CANCER BIOMARKER DIAGNOSIS

Naoki Kakita², Hidetoshi Miyashita², Satoru Kishida², Jeong-O Lee¹, Sang-Seok Lee²

¹*Korea Research Institute of Chemical Engineering, Korea, South;*

²*Tottori University, Japan*

11:00 AM

CANTILEVER-BASED RESONANT GAS SENSORS WITH INTEGRATED RECESSES FOR LOCALIZED SENSING LAYER DEPOSITION

Christopher Carron¹, Patrick Getz¹, Jin-Jyh Su¹, David Gottfried¹, Oliver Brand¹, Fabien Josse², Stephen Heinrich²

¹*Georgia Institute of Technology, United States;* ²*Marquette University, United States*

11:15 AM

TUNGSTEN OXIDE NANOWIRE SENSORS GROWN BY COLD WALL REACTOR AEROSOL ASSISTED CHEMICAL VAPOUR DEPOSITION

Fatima-Ezahra Annanouch², Eduard Llobet², Russell Binions¹

¹*Queen Mary, University of London, United Kingdom;* ²*Universitat Rovira I Virgili, Spain*

11:30 AM

OPTO-ELECTROCHEMICAL BASED DUAL DETECTION OF HEAVY METAL COMPOUNDS USING A NOVEL FLOW CELL

Binu Baby Narakathu, Sai Guruva Reddy Avuthu, Ali Eshkeiti, Bradley Bazuin, Massood Zandi Atashbar

Western Michigan University, United States

11:45 AM

TIN DIOXIDE NANO-WIRE DEVICE FOR SENSING KINETICS OF ACETONE AND ETHANOL TOWARDS DIABETES MONITORING

Bonex Mwakikunga^{1,4}, Suprakas Ray¹, Malose Mokwena², John Dewar², Irina Geibelhaus³, Trilok Singh³, Thomas Fischer³, Sanjay Mathur³

¹DST/CSIR National Centre for Nano-Structured Materials, South Africa; ²University of South Africa, South Africa; ³University of Cologne, Germany; ⁴University of Malawi – The Polytechnic

10:45 AM - 12:00 PM

B2L-B: MECHANICAL

Maryland E

Session Chairs: Dae-sik Lee (ETRI, South Korea), Geunbae Lim (Pohang University of Science & Technology, South Korea)

10:45 AM

OSCILLATION-BASED TEST APPLIED TO CELL CULTURE MONITORING

Gloria Huertas¹, Andrés Maldonado¹, Alberto Yúfera^{1,2}, Adoración Rueda¹, José Luis Huertas¹

¹Instituto de Microelectronica de Sevilla, CSIC, Spain; ²Universidad de Sevilla

11:00 AM

DETECTION OF INTERACTION BETWEEN BIOLOGICAL PROTEINS AND IMMOBILIZED LIPOSOMES BY A MICRO-CANTILEVER WITH NICR THIN FILM STRAIN GAUGE

Masayuki Sohgewa², Takashi Fujimoto¹, Keisuke Takada¹, Kaoru Yamashita¹, Minoru Noda¹

¹Kyoto Institute of Technology, Japan; ²Niigata University, Japan

11:15 AM

A NOVEL, MULTIPARAMETRIC, FLEXIBLE MICROSENSOR FOR METABOLIC MONITORING IN VIVO

Andreas Weltin, Barbara Enderle, Jochen Kieninger, Gerald Urban
University of Freiburg, IMTEK, Germany

11:30 AM

MEMS BASED BLOOD PLASMA VISCOSITY SENSOR WITHOUT ELECTRICAL CONNECTIONS

Onur Cakmak², Erhan Ermek², Hakan Urey², Goksenin G. Yaralioglu³, Necmettin Kilinc¹

¹Gebze Institute of Technology, Turkey; ²Koc University, Turkey;

³Ozyegin University, Turkey

11:45 AM

A NEW NON-INVASIVE CUFF-LESS BLOOD PRESSURE SENSOR

Tse-Yi Tu², Paul C.-P. Chao², Yung-Pin Lee¹

¹MedSense Inc., Taiwan; ²National Chiao Tung University, Taiwan

10:45 AM - 12:00 PM

B2L-C: TACTILE SENSORS

Maryland A

Session Chairs: Rajanna Konandur (Indian Institute of Science, India), Siavash Pourkamali (University of Texas at Dallas, USA)

10:45 AM

INVITED TALK: CMOS TACTILE SENSOR SYSTEMS

Patrick Ruther¹, Felix Becker¹, Matthias Herrmann¹, Christian Sander¹, Falco Schmidt², Bernd Lapatki², Oliver Paul¹

¹University of Freiburg, Germany; ²University of Ulm, Germany

11:15 AM

LARGE AREA ALL-ELASTOMER CAPACITIVE TACTILE ARRAYS

Peter Block, Sarah Bergbreiter

University of Maryland, United States

11:30 AM

A VERY HIGH DENSITY FLOATING ELECTRODE FLEXIBLE SENSOR ARRAY FOR HIGH-RESOLUTION MEASUREMENTS OF CONTACT FORCES

Rajesh Surapaneni, Qingbo Guo, Darrin Young, Carlos Mastrangelo

University of Utah, United States

11:45 AM

SELF-POWERED, TACTILE PRESSURE SENSING SKIN USING CRYSTALLINE ZNO NANOROD ARRAYS FOR ROBOTIC APPLICATIONS

Bhargav Nabar, Zeynep Celik-Butler, Donald P. Butler

University of Texas at Arlington, United States

10:45 AM - 12:00 PM

B2L-D: SENSORS PHENOMENA

Maryland D

Session Chairs: Luc Hebrard (CNRS - ICube, France), Venkata Chivukula (RF Micro Devices, USA)

10:45 AM

META-MATERIALS APPROACH TO SENSITIVITY ENHANCEMENT OF MEMS BAW RESONANT SENSORS

Xavier Rottenberg², Roelof Jansen², Vladimir Cherman², Ann Witvrouw², Harrie Tilmans², Mohamed Zanaty³, Ahmed Khaled³, Mohammed Abbas¹

¹Assiut University, Egypt; ²Imec, Belgium; ³CENA, Belgium

11:00 AM

NONLINEAR ANALYSIS OF ELECTROTHERMAL POSITION SENSORS WITH CONTOURED HEATERS

Ali Bazaei, Anthony G. Fowler, S.O. Reza Moheimani

University of Newcastle, Australia

11:15 AM

OPTIMISATION OF A TOMOGRAPHY SENSOR FOR IMAGING OF TEMPERATURE IN A GAS TURBINE ENGINE

Michael Wood, Krikor Ozanyan

University of Manchester, United Kingdom

11:30 AM

PROPOSAL OF ADVANCED NONLINEAR SIGNAL MODEL TO ANALYZE PHOTOPLETHYSMOGRAM SIGNALS

Hajime Ozaki, Yasuhisa Omura
Kansai University, Japan

11:45 AM

ULTRASONIC FLOW MEASUREMENT BY TRACKING STREAMLINES IN PIPES

Manuel Haide
University of Applied Sciences, Germany

10:45 AM - 12:00 PM

**B2L-E: WIRELESS SENSOR NETWORKS FOR HEALTH II
Watertable ABC**

**Session Chairs: Elfed Lewis (University of Limerick, Ireland),
Paddy French (TU Delft, The Netherlands)**

10:45 AM

DEVELOPMENT OF A POTENTIALLY IMPLANTABLE PRESSURE SENSING PLATFORM WITH RFID INTERFACE

Michele Caldara, Benedetta Nodari, Valerio Re
University of Bergamo, Italy

11:00 AM

ULTRA LOW POWER CH₄ MONITORING WITH WIRELESS SENSORS

Maurizio Rossi, Davide Brunelli
University of Trento, Italy

11:15 AM

WIRELESS SENSOR NETWORK FOR STRUCTURAL HEALTH MONITORING USING SYSTEM-ON-CHIP WITH ANDROID SMARTPHONE

Won-Jae Yi, Spenser Gilliland, Jafar Saniie
Illinois Institute of Technology, United States

11:30 AM

MULTI-AGENT BASED WIRELESS PYROELECTRIC INFRARED SENSOR NETWORKS FOR MULTI-HUMAN TRACKING AND SELF-CALIBRATION

Jiang Lu, Jiaqi Gong, Qi Hao, Fei Hu
University of Alabama, United States

11:45 AM

TOWARDS THE WORLD SMALLEST WIRELESS SENSOR NODES WITH LOW POWER CONSUMPTION FOR 'GREEN' SENSOR NETWORKS

Jian Lu^{1,2}, Hironao Okada^{1,2}, Toshihiro Itoh^{1,2}, Ryutarō Maeda^{1,2}, Takeshi Harada²

¹National Institute of Advanced Industrial Science and Technology, Japan; ²NMEMS Technology Research Organization, Japan

10:45 AM - 12:00 PM

B2L-F: MICROSYSTEMS APPLICATIONS

Homeland

Session Chair: Alper Bozkurt (North Carolina State University, USA)

10:45 AM

MICROFLUIDIC DEVICE FOR TRIGGERED CHIP TRANSIENCE

Niladri Banerjee, Yan Xie, Hanseup Kim, Carlos Mastrangelo
University of Utah, United States

11:00 AM

MICROFABRICATED TWO-DIMENSIONAL (2D) HEXAGONAL LATTICE TRAP

Hwanjit Rattanasonti¹, Prasanna Srinivasan¹, Michael Kraft¹, Robin Sterling², Sebastian Weidt², Kimberley Lake², Simon Webster², Winfried Hensinger²
¹*University of Southampton, United Kingdom*; ²*University of Sussex, United Kingdom*

11:15 AM

DURABLE AND COST-EFFECTIVE 3-D MICROFORCE SENSOR FOR MUSICAL TUNING ENHANCED MICRO PALPATION OF BIOLOGICAL ENTITIES

Yudong Luo, Yantao Shen, Nithya Mohan
University of Nevada, Reno, United States

11:30 AM

FACTORS AFFECTING BLIND LOCALIZATION OF A GLASS MICROPIPETTE USING A HIGH-DENSITY MICROELECTRODE ARRAY

Marie Engelene Obien², Andreas Hierlemann¹, Urs Frey^{1,2}
¹*ETH Zürich, Switzerland*; ²*RIKEN, Japan*

11:45 AM

DROPLET MIXING AND LIQUID PROPERTY TRACKING USING AN ELECTRODYNAMIC PLATE RESONATOR

Erwin K. Reichel, Martin Heinisch, Bernhard Jakoby
Johannes Kepler University, Austria

TUESDAY, NOVEMBER 5TH – POSTER SESSION

2:00 PM - 3:30 PM

B3P-G: CHEMICAL & GAS SENSORS IV

Poster Area - Baltimore AB

Session Chair: Bassam Alfeeli (Kuwait Institute for Scientific Research, Kuwait)

B3P-G1

INKJET PRINTED ELECTRODES FOR DETERMINATION OF SULFUR DIOXIDE AND ASCORBIC ACID IN WINE

Marion Schneider¹, Alexander Türke¹, Wolf-Joachim Fischer¹, Paul Kilmartin²

¹Technische Universität Dresden, Germany; ²University of Auckland, New Zealand

B3P-G2

FABRICATION OF PH-SENSING IRIIDIUM OXIDE NANOTUBES ON PATTERNED ELECTRODES USING ANODIC ALUMINUM OXIDE NANOTEMPLATE

Cuong Nguyen, Indra Gurung, Hung Cao, Smitha Rao, Jung-Chih Chiao

University of Texas at Arlington, United States

B3P-G3

A NOVEL ELECTROCHEMICAL SYNTHESIS ROUTE FOR COPPER NANOWIRE FORMATION

Cindy Schmädicke¹, Markus Pötschke¹, Lars David Renner¹, Gianaurelio Cuniberti²

¹Technische Universität Dresden, Germany; ²POSTECH

B3P-G4

WIRELESS AND PORTABLE SENSOR SYSTEM TO DIFFERENTIATE MUSTS OF DIFFERENT GRAPE VARIETIES AND DEGREE OF GRAPE RIPENESS

Manuel Aleixandre¹, Enrique Montero¹, Jose Pedro Santos¹, Isabel Sayago¹, María Del Carmen Horrillo¹, Juan Mariano Cabellos², Teresa Arroyo²

¹ITEFI-CSIC, Spain; ²IMIDRA, Spain

B3P-G5

A CMOS PLATFORM FOR THE INTEGRATION OF HETEROGENEOUS ARRAYS OF CARBON NANOTUBES AND GRAPHENE CHEMIREISTORS

Samuel MacNaughton, Sameer Sonkusale

Tufts University, United States

B3P-G6

TEMPERATURE-CONTROLLED ELECTROCHEMICAL MICROWELL PLATFORM FOR STUDYING BIOMOLECULAR INTERACTIONS

Zuliang Shen², Herman Sintim², Steve Semancik¹

¹National Institute of Standards and Technology, United States;

²University of Maryland, United States

B3P-G7**SELF-TUNING POROUS SILICON CHEMITRANSISTOR GAS SENSORS**

Giovanni M Lazzerini, Lucanos M Strambini, Giuseppe Barillaro
Università di Pisa, Italy

B3P-G8**IN-SITU GROWN CARBON NANOTUBES FOR ENHANCED CO₂ DETECTION IN NON-DISPERSIVE-INFRA-RED SYSTEM**

Andrea De Luca², Zoltan RÁCZ⁴, Matthew Cole², Zeeshan Ali¹, Florin Udrea^{1,2}, Julian Gardner⁴, William Milne^{2,3}

¹Cambridge CMOS Sensors Ltd, United Kingdom; ²University of Cambridge, United Kingdom; ³Kyung Hee University, United Kingdom; ⁴University of Warwick, United Kingdom

B3P-G9**A LOW-COST, FLEXIBLE ELECTROCHEMICAL SENSOR FOR MONITORING SILVER ION CONCENTRATION IN ALGINATE WOUND DRESSINGS**

Rahim Rahimi, Manuel Ochoa, Babak Ziaie
Purdue University, United States

B3P-G10**EXTENDING UPPER CUTOFF FREQUENCY OF ELECTROCHEMICAL SEISMOMETER BY USING EXTREMELY THIN SU8 INSULATING SPACERS**

Wentao He, Deyong Chen, Junbo Wang, Jian Chen, Tao Deng
Chinese Academy of Sciences, China

B3P-G11**NOVOLAC-MODIFIED SELF-SENSING PIEZOELECTRIC MICROCANTILEVER GAS SENSOR**

Masoud Khabiry, Nader Jalili, Srinivas Sirdhar
Northeastern University, United States

2:00 PM - 3:30 PM

B3P-H: BIOSENSORS II

Poster Area - Baltimore AB

Session Chairs: Yu-Cheng Lin (National Cheng Kung University, Taiwan), Hongrui Jiang (University of Wisconsin, USA)

B3P-H1**WATER TOXICITY DETECTION USING CELL-BASED HYBRID BIOSENSORS**

Fei Liu¹, Ioana Voiculescu¹, Anis Nurashikin Nordin², Fang Li³

¹City College of New York, United States; ²International Islamic University Malaysia, Malaysia; ³New York Institute of Technology, United States

B3P-H2**HRP BIOSENSOR BASED ON CARBONIZED MAIZE TASSEL-MWNTS MODIFIED ELECTRODE FOR THE DETECTION OF DIVALENT TRACE METAL IONS**

Mambo Moyo², Jonathan Okonkwo², Nana Agyei¹

¹University of Limpopo, South Africa; ²Tshwane University of Technology, South Africa

B3P-H3**A CONFORMAL SENSOR FOR WIRELESS SWEAT LEVEL MONITORING**

Pinghung Wei, Briana Morey, Timothy Dyson, Nick McMahon, Yung-Yu Hsu, Sasha Gazman, Lauren Klinker, Barry Ives, Kevin Dowling, Conor Rafferty

MC10 Inc., United States

B3P-H4**PRECISION TRANSDUCER FOR FLUORESCENCE-BASED IMMUNOASSAYS**

Arash Ghadar, Julian Gardner, Chris Dowson

University of Warwick, United Kingdom

B3P-H5**APPLICATION OF CHEMILUMINESCENCE INVOLVING FLOW INJECTION ANALYSIS TO DETERMINATION OF GLUCOSE, GLUTAMIC ACID AND LACTIC ACID FOR FOOD ANALYSIS**

Xin Wang¹, Naoko Ishii³, Ming Ye¹, Munkhbayar Munkhjargal¹, Kumiko Miyajima¹, Takahiro Arakawa¹, Hirokazu Saito², Hiroyuki Kudo¹, Hideaki Endo³, Kohji Mitsubayashi¹

¹*Tokyo Medical and Dental University, Japan;* ²*Tokyo National College of Technology, Japan;* ³*Tokyo University of Marine Science and Technology, Japan*

B3P-H6**IMPLANTABLE SIC BASED RF ANTENNA BIOSENSOR FOR CONTINUOUS GLUCOSE MONITORING**

Shamima Afroz, Sylvia Thomas, G. Mumcu, S.E. Saddow

University of South Florida, United States

B3P-H7**SLOPE AND CANTILEVER TYPE ELECTRODE FABRICATION FOR MEASUREMENT OF NEUROSPHEROID SIGNAL**

Ju-Young Jin¹, Boo-Yong Lee¹, Jin You¹, Jinseok Kim¹, Jungyul Park⁴, Yu-Shik Hwang², Kukjin Chun³

¹*Korea Institute of Science and Technology, Korea, South;* ²*Kyung Hee University, Korea, South;* ³*Seoul National University, Korea, South;* ⁴*Sogang University, Korea, South*

B3P-H8**ULTRA LOW POWER WIRELESS ECG SENSOR TAG WITH WEARABLE ANTENNA**

Hitoshi Kitayoshi, Kunio Sawaya, Hiroki Kuwano

Tohoku University, Japan

B3P-H9**TERAHERTZ CONICAL HORN WAVEGUIDE COUPLER FOR SPECTROSCOPIC ANALYSIS OF BIOMATERIALS**

Weidong Zhang, Elliott Brown, Leamon Viveros

Wright State University, United States

B3P-H10**LIQUID HEATING CAN CAUSE DENATURATION OF SENSING LAYER IN SAW BIOSENSORS**

Kamlesh Suthar¹, Subramanian Sankaranarayanan¹, Mandek Richardson², Venkat Bhethanabotla²

¹Argonne National Laboratory, United States; ²University of South Florida, United States

B3P-H11**PHOTOMETRIC APTASENSOR USING BIOFUNCTIONALIZED PHOTONIC CRYSTAL SLABS**

Sabrina Jahns, Yousef Nazirizadeh, Björn-Ole Meyer, Martina Gerken, Sören Gutekunst, Christine Selhuber-Unkel

Christian-Albrechts-Universität zu Kiel, Germany

B3P-H12**DIELECTRIC CHARACTERIZATION OF IMATINIB RESISTANT K562 LEUKEMIA CELLS THROUGH ELECTROROTATION WITH 3-D ELECTRODES**

Garsha Bahrieh, Hatice Ceylan Koydemir, Murat Erdem, Ebru Özgür, Ufuk Gündüz, Haluk Külah

Middle East Technical University (METU), Turkey

B3P-H13**ENZYME BIOTRANSducers FORMED FROM CONDUCTIVE ELECTROACTIVE POLYMERS**

Guneet Bedi, Christian Kotanen, Olukayode Karunwi, Amanda Nguyen, Ferhat Bayram, Brian Hudson, Yu Zhao, Anthony Guiseppi-Elie

Clemson University, United States

B3P-H14**ORGANOPHOSPHATE PESTICIDES DETERMINATION BASED ON LABEL-FREE LOCALIZED SURFACE PLASMON RESONANCE**

Jie-Hui Li, Hong-Yan Dou, Xin-Ming Ji

Fudan University, China

B3P-H15**EFFECTS OF ACID OXIDATION ON CARBON NANOTUBE BASED ELECTRODES FOR DETECTION OF OXIDIZED LDL**

Seiji Takeda, Toshihiro Sakurai, Futaba Ohkawa, Shigeki Jin, Shu-Ping Hui, Hirotohi Fuda, Koichi Mukasa, Hitoshi Chiba, Kazuhisa Sueoka

Hokkaido University, Japan

2:00 PM - 3:30 PM

B3P-J: PIEZOELECTRIC, TACTILE & PRESSURE SENSORS

Poster Area - Baltimore AB

Session Chairs: Christian Zorman (Case Western Reserve University, USA), Libor Rufer (TIMA Laboratory, France)

B3P-J1**SENSITIVITY-ENHANCED ULTRASONIC MICROSENSORS ON BUCKLED DIAPHRAGMS THROUGH STRESS BALANCE CONTROL OF MULTILAYERED STRUCTURE**

Kaoru Yamashita, Hikaru Tanaka, Yi Yang, Minoru Noda

Kyoto Institute of Technology, Japan

B3P-J2**A PIEZORESISTIVE PRESSURE SENSOR WITH IMPROVED SENSITIVITY IN LOW PRESSURE CONDITION**

Huiyang Yu, Ming Qin, Jianqiu Huang
Southeast University, China

B3P-J3**ONE SIDE ELECTRODE TYPE FLUIDIC BASED CAPACITIVE PRESSURE SENSOR**

Mohd Norzaidi Mat Nawi, Asrulnizam Abdul Manaf, Mohamad Faizal Abd Rahman, Mohd Rizal Arshad, Othman Sidek
Universiti Sains Malaysia, Malaysia

B3P-J4**A MICRO-PRESSURE SENSOR WITH HIGH SENSITIVITY AND OVERLOAD RESISTANCE**

Zhongliang Yu, Yulong Zhao, Cun Li, Yan Liu, Guanwu Zhou, Bian Tian
Xi'an Jiaotong University, China

B3P-J5**STATIC AND DYNAMIC RESPONSES OF GAN PIEZORESISTIVE MICROCANTILEVER WITH EMBEDDED ALGAN/GAN HFET FOR SENSING APPLICATIONS**

Abdul Talukdar², Muhammad Qazi¹, Goutam Koley²
¹Intel Corp., United States; ²University of South Carolina, United States

B3P-J6**A DIFFERENTIAL RESONANT BAROMETRIC PRESSURE SENSOR USING SOI-MEMS TECHNOLOGY**

Zhenyu Luo, Deyong Chen, Junbo Wang, Jian Chen
Chinese Academy of Sciences, China

B3P-J7**HIGH SENSITIVITY SQUARE RING CHANNEL SHAPED MOSFET EMBEDDED PRESSURE SENSOR INTEGRATED WITH A CURRENT MIRROR READOUT CIRCUITRY**

Pradeep Kumar Rathore¹, Brishbhan Singh Panwar¹, Hardik Jeetendra Pandya²
¹Indian Institute of Technology Delhi, India; ²University of Maryland, United States

B3P-J8**FABRICATION AND CHARACTERIZATION OF FLEXIBLE PRESSURE SENSOR ARRAYS MADE BY FILM TRANSFER TECHNOLOGY**

Thi-Hong-Nhung Dinh, Pierre-Yves Joubert, Emile Martincic, Elisabeth Dufour-Gergam
Université Paris-Sud, France

B3P-J9**MICRO SENSORS WITH POLYMER MEMBRANE FOR ACCURATE 3D FORCE AND DISPLACEMENT MEASUREMENTS**

Nelson Ferreira¹, Thomas Krah¹, Andreas Dietzel¹, Stephanus Büttgenbach¹, Alejandro Sierra Granada², Jose Antonio Albajez García²

¹*Technische Universität Braunschweig, Germany;* ²*Universidad de Zaragoza - EINA, Spain*

B3P-J10**THREE-AXIAL FORCE SENSOR WITH CAPACITIVE READ-OUT USING A DIFFERENTIAL RELAXATION OSCILLATOR**

Robert Brookhuis, Remco J Wiegerink, Theo S. J Lammerink, Gijs J.M Krijnen

University of Twente, Netherlands

B3P-J11**A SURFACE MICROMACHINED MEMS CAPACITIVE MICROPHONE WITH BACK-PLATE SUPPORTING PILLARS**

Chang Han Je, Jaewoo Lee, Woo Seok Yang, Jong-Kee Kwon
Electronics and Telecommunications Research Institute (ETRI), Korea, South

B3P-J12**DESIGNS OF PLANAR SENSING INDUCTOR ON INVERSE-MAGNETOSTRICTIVE TYPE PRESSURE SENSOR**

Heng-Chung Chang, Sheng-Chieh Liao, Hsieh-Shen Hsieh, Jung-Hung Wen, Chao-Lin Cheng, Su-Jhen Lin, Chih-Huang Lai, Weileun Fang

National Tsing Hua University, Taiwan

B3P-J13**FORCE INTENSITY AND DIRECTION MEASUREMENT IN REAL TIME USING MINIATURE TACTILE SENSOR WITH MICROCANTILEVERS EMBEDDED IN PDMS**

Hokuto Yokoyama³, Masayuki Sohgawa^{1,3}, Takeshi Kanashima³, Masanori Okuyama³, Takashi Abe¹, Haruo Noma⁴, Teruaki Azuma²

¹*Niigata University, Japan;* ²*Nitta Corporation, Japan;* ³*Osaka University, Japan;* ⁴*Ritsumeikan University, Japan*

B3P-J14**A LATERAL-AXIS MEMS TUNING FORK GYROSCOPE WITH NOZZLE-OPTIMIZED SQUEEZE-FILM SENSING ELEMENT**

Minghao Nie, Dachuan Liu, Liguang Dong, Qiancheng Zhao, Zhenchuan Yang, Guizhen Yan

Peking University, China

2:00 PM - 3:30 PM

B3P-K: PHENOMENA, MODELING & EVALUATION

Poster Area - Baltimore AB

Session Chairs: Svetlana Tatic-Lucic (Lehigh University, USA),
Srinivas Tadigadapa (Pennsylvania State University, USA)

B3P-K1

NANOMACHINED PYROELECTRIC DETECTOR WITH LOW THERMAL CONDUCTANCE - DESIGN AND CONCEPTS

Md Muztoba¹, Nouredine Melikechi¹, Mukti Rana¹, Donald P. Butler²

¹Delaware State University, United States; ²University of Texas at Arlington, United States

B3P-K2

2-D MODEL OF THE INDIRECTLY-HEATED TYPE MICROWAVE POWER SENSOR BASED ON GAAS MMIC PROCESS

Zhenxiang Yi, Xiaoping Liao, Hao Wu

Southeast University, China

B3P-K3

ENHANCED COUPLING OF PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS WITH INITIAL STATIC DEFLECTION

Firas Sammoura^{1,2}, Sina Akhbari³, Liwei Lin³, Sang Gook Kim²

¹Masdar Institute of Science and Technology, U.A.E.; ²Massachusetts Institute of Technology, United States; ³University of California, Berkeley, United States

B3P-K4

SIZE-DEPENDENT THERMAL EXPANSION PROPERTIES OF SILICON NANOWIRES

Wei-Wei Zhang¹, Hua Zhang¹, Xu-Dong Li¹, Yan-Ru Li¹, Hong Yu², Qing-An Huang²

¹Jiangsu Academy of Science & Technology for Development, China; ²Southeast University, China

B3P-K5

THE ROLE OF INTERFACE IN UNPASSIVATED SI3-XGEX HETEROSTRUCTURE NANOWIRES ALONG THE <111> DIRECTION

Yi Li, Shuang-Ying Lei, Rui-Feng Han, Hong Yu, Jie Chen, Qing-An Huang

Southeast University, China

B3P-K6

MICROFLUIDICS-BASED ACOUSTIC MICROBUBBLE BIOSENSOR

Ying Zhou, Ashwin A. Seshia, Elizabeth A. H. Hall

University of Cambridge, United Kingdom

B3P-K7

FOUR-PROBE BRIDGES FOR IN SITU DETERMINATION OF GEOMETRICAL PARAMETERS OF SURFACE MICROMACHINED THIN FILMS

Hai-Yun Liu, Wei-Hua Li, Zai-Fa Zhou, Qing-An Huang

Southeast University, China

B3P-K8**INTERFACE DISSIPATION IN PIEZOELECTRIC MEMS RESONATORS: AN EXPERIMENTAL AND NUMERICAL INVESTIGATION**

Attilio Frangi¹, Massimiliano Cremonesi¹, Antti Jaakkola², Tuomas Pensala²

¹*Politecnico di Milano, Italy;* ²*VTT Technical Research Centre of Finland, Finland*

B3P-K9**DIMENSION OPTIMIZATION FOR A MINIATURE HIGH-FREQUENCY QUARTZ RESONATOR**

Jing Ji, Meng Zhao, Yupeng Zhang, Satoshi Ikezawa, Toshitsugu Ueda

Waseda University, Japan

B3P-K10**ELECTRIC FIELD SENSING: WHAT IS BROUGHT BY DUALITY FROM FLUX GATES?**

Didier Robbes², Corentin Jorel², Emmanuel Olivier², Laurence Méchin², Sylvain Lebagry², Rachid Bouregba¹, Gilles Poullain¹, Christophe Cibert¹

¹*ENSICAEN, France;* ²*UNICAEN, France*

B3P-K11**TERAHERTZ DETECTION OF BACILLUS THURINGIENSIS SPORES IN DIPEL®**

Leamon Viveros, Weidong Zhang, Elliott Brown

Wright State University, United States

B3P-K12**DESIGN AND OPTIMIZATION OF AN ELECTROSTATIC MICRO-HARVESTER FOR SENSORS APPLICATIONS**

Yi Li, Zeynep Celik-Butler, Donald P. Butler

University of Texas at Arlington, United States

B3P-K13**THICKNESS DEPENDENT ADHESION FORCE AND ITS CORRELATION TO SURFACE ROUGHNESS IN MULTILAYERED GRAPHENE**

Hoorad Pourzand, Pradeep Pai, Massood Tabib-Azar

University of Utah, United States

B3P-K14**MODELING OF MOVING COIL CAPACITANCE IN AN IRONLESS INDUCTIVE POSITION SENSOR**

Alessandro Danisi¹, Alessandro Masi¹, Roberto Losito¹, Luca Sabato²

¹*European Organization for Nuclear Research (CERN), Switzerland;*

²*Universita degli Studi del Sannio, Italy*

B3P-K15**ENHANCING THE ACOUSTIC STREAMING INDUCED REMOVAL OF NON-SPECIFICALLY BOUND PROTEINS IN QUARTZ BASED SAW BIOSENSORS USING A ZNO WAVEGUIDE**

Kamlesh Suthar¹, Subramanian Sankaranarayanan¹, Gayathri Mistri², Mandek Richardson³, Venkat Bhethanabotla³

¹*Argonne National Laboratory, United States;* ²*University of Illinois at Chicago, United States;* ³*University of South Florida, United States*

B3P-K16**MODELING OF PIEZOELECTRIC TUBE RESONATORS FOR LIQUID SENSING APPLICATIONS**

Thomas Voglhuber-Brunnmaier¹, Hannes Antlinger¹, Bernhard Jakoby¹, Roman Beigelbeck²

¹Johannes Kepler University, Austria; ²Vienna University of Technology, Austria

B3P-K17**EFFECT OF DESIGN PARAMETERS ON THE ROTATIONAL RESPONSE OF A NOVEL DISK RESONATOR FOR LIQUID-PHASE SENSING: ANALYTICAL RESULTS**

Mohamad Sotoudegan², Stephen Heinrich², Fabien Josse², Nicholas Nigro², Isabelle Dufour³, Oliver Brand¹

¹Georgia Institute of Technology, United States; ²Marquette University, United States; ³Universite de Bordeaux, France

B3P-K18**SYMMETRY BREAKING OSCILLATIONS IN ELECTROSTATIC MEMS UNDER SUPERHARMONIC EXCITATION**

Anindya Lal Roy, Tarun Kanti Bhattacharyya

Indian Institute of Technology, India

B3P-K19**HIGH PERFORMANCE NEMS ULTRAHIGH SENSITIVE RADIATION SENSOR BASED ON PLATINUM NANORODS CAPACITOR**

Abdelhameed Sharaf^{1,2}, Asmaa Gamal¹, Mohamed Serry¹

¹The American University in Cairo, Egypt; ²NCRRT, Egyptian Atomic Energy Authority, Egypt

2:00 PM - 3:30 PM

B3P-L: SENSOR NETWORKS I

Poster Area - Baltimore AB

Session Chair: Elliott Brown (Wright State University, USA)

B3P-L1**A LOW-POWER WIRELESS UHF / LF SENSOR NETWORK WITH WEB-BASED REMOTE SUPERVISION - IMPLEMENTATION IN THE INTELLIGENT CONTAINER**

Nils Heidmann, Nico Hellwege, Dagmar Peters-Drolshagen, Steffen Paul, Alexander Dannies, Walter Lang

University of Bremen, Germany

B3P-L2**TIMESTAMPING AND LATENCY ANALYSIS FOR MULTI-SENSOR PERCEPTION SYSTEMS**

Mohamed Brahm², Kai Schueler³, Essayed Bouzouraa¹, Markus Maurer², Karl-Heinz Siedersberger¹, Ulrich Hofmann¹

¹AUDI AG, Germany; ²Technische Universität Braunschweig, Germany; ³Technische Universität München, Germany

B3P-L3**A HOME MONITORING SYSTEM FOR ELDERLY PEOPLE BASED ON MEMS SENSORS AND WIRELESS NETWORKS**

Fangxiu Jia, Yujia Sun, Jiyan Yu, Xiaoming Wang

Nanjing University of Science and Technology, China

B3P-L4**RECONFIGURABLE ARCHITECTURE FOR SMART SENSOR NODE BASED ON IEEE 1451 STANDARD**

Arturo Fatecha, Jean Guevara, Enrique Vargas

¹Catholic University Asuncion, Paraguay

B3P-L5**COVERAGE ESTIMATION IN HETEROGENOUS FLOORPLAN VISUAL SENSOR NETWORKS**

Ahmad Movahedian Attar¹, Shantia Yarahmadian², Shadrokh Samavi¹

¹Isfahan University of Technology, Iran; ²Mississippi State University, United States

B3P-L6**A SEMANTICALLY-ADAPTIVE STRATEGY FOR ENERGY-EFFICIENCY IN WIRELESS MEDICAL MONITORING DEVICES**

Vishwa Goudar, Miodrag Potkonjak

University of California, Los Angeles, United States

B3P-L7**DEVELOPMENT OF SERVICE NETWORK FOR WEARABLE TYPE ACUTE MYOCARDIAL INFARCTION DIAGNOSIS SYSTEM**

Jaehyo Jung, Jihwan Lee, Jihoon Lee, Youn Tae Kim

Chosun University, Korea, South

B3P-L8**DESIGN AND VALIDATION OF A WIRELESS SENSOR NODE FOR LONG TERM STRUCTURAL HEALTH MONITORING**

Fabio Federici, Roberto Alesii, Andrea Colarieti, Fabio Graziosi, Marco Faccio

University of L'Aquila, Italy

2:00 PM - 3:30 PM

B3P-M: APPLICATION I

Poster Area - Baltimore AB

Session Chair: David Horsley (University of California, Davis, USA)

B3P-M1**OPTICAL CHARACTERIZATION OF MICROPATTERNED ANODIC ALUMINUM OXIDE (AAO) USING UV LIGHT FOR ITS FLUORESCENCE APPLICATIONS**

Xiang Li, Haocheng Yin, Tingting Wang, Long Que

Louisiana Tech University, United States

B3P-M2**MEASUREMENT OF HUMAN BODY STIFFNESS FOR LIFTING-UP MOTION GENERATION USING NURSING-CARE ASSISTANT ROBOT - RIBA**

Ming Ding², Ryojun Ikeura¹, Yuki Mori², Toshiharu Mukai², Shigeyuki Hosoe²

¹Mie University, Japan; ²RIKEN, Japan

B3P-M3**NON CONTACT MEASUREMENT OF BODY TEMPERATURE FOR THE IDENTIFICATION OF THERMOREGULATION ABILITIES IN PRETERM PATIENTS**

Ilaria Ercoli, Paolo Marchionni, Lorenzo Scalise, Enrico Primo Tomasini, Virgilio Paolo Carnielli
Università Politecnica delle Marche, Italy

B3P-M4**DETERMINATION OF BURN DEPTH ON BIOLOGICAL TISSUES BY DIELECTRIC MEASUREMENT AT MICROWAVE FREQUENCIES**

Mathieu Brusson², Jérôme Rossignol², Stéphane Binczak², Gabriel Laurent¹

¹Centre Hospitalier Universitaire, France; ²Université de Bourgogne, France

B3P-M5**DEVELOPMENT AND PERFORMANCE EVALUATION OF PORTABLE BRAILLE SCANNER USING SIMPLE PLATE SPRING SENSOR**

Hiroyuki Takanashi¹, Ryosuke Mimura¹, Tetsushi Mimuro¹, Hiroyuki Kodama², Takeshi Ito²

¹Akita Prefectural University, Japan; ²Akita Techno Design Co, Ltd, Japan

B3P-M6**METAL-LENGTH SENSOR WITH ANTENNA RESONANT DETECTOR FOR PRESCRIPTION GUIDANCE OF ORAL PILL MEDICATION**

Hisashi Nishikawa, Takahiro Yamanaka, Hirofumi Yoshioka, Ami Tanaka, Takakuni Douseki
Ritsumeikan University, Japan

B3P-M7**EEG-FMRI FEATURES ANALYSIS IN ODORANTS STIMULI WITH CITRALVA AND 2-MERCAPTOETHANOL**

Won-Seok Kang¹, Hyung-Oh Kwon¹, Cheil Moon¹, Jin Kook Kim², Sanghun Yun¹, Samhwan Kim¹

¹Daegu Gyeongbuk Institute of Science and Technology, Korea, South; ²Konkuk University Medical Center, Korea, South

B3P-M8**PAPER-BASED SUPER-CAPACITOR USING MICRO AND NANO PARTICLE DEPOSITION FOR PAPER-BASED DIAGNOSTICS**

Pooria Mostafalu, Sameer Sonkusale
Tufts University, United States

B3P-M9**STRUCTURAL RELIABILITY AND THERMAL INSULATION PERFORMANCE OF FLEXIBLE THERMOELECTRIC GENERATOR FOR WEARABLE SENSORS**

Luca Francioso¹, Chiara De Pascali¹, Pietro Siciliano¹, Ruben Bartali², Elisa Morganti², Leandro Lorenzelli², Arturo De Risi³

¹Institute for Microelectronics and Microsystems, Italy; ²FBK Bruno Kessler Foundation, Italy; ³University of Salento, Italy

B3P-M10**USING TACTILE SENSORS TO ESTIMATE CARE RECEIVER POSITION ON DUAL ARMS OF ROBOT**

Yuki Mori², Ryojun Ikeura¹, Ming Ding²

¹Mie University, Japan; ²RIKEN, Japan

B3P-M11**MONITOR COLOR SENSING USING LOW-COST FILTER ARRAY SPECTRUM SENSOR**

Cheng-Chun Chang², Chia-Jui Chuang², Yung-Chi Chuang², Byung Il Choi¹, Kwansik Lee¹, Seongsu Woo¹

¹nanoLambda Incorporated, Korea, South; ²National Taipei University of Technology, Taiwan

B3P-M12**AN EVALUATION OF ELECTRIC FIELD SENSORS FOR PROJECTILE DETECTION**

Cassandra Browning², Stephen Vinci², Maciej Noras¹, Jack Zhu², David Hull²

¹University of North Carolina at Charlotte, United States; ²US Army Research Laboratory, United States

B3P-M13**IN-SITU SOOT PARTICLE SENSING IN AN AERO-ENGINE EXHAUST PLUME**

David McCormick², Krikor Ozanyan², John Black¹, Yutong Feng³

¹Rolls-Royce plc, United Kingdom; ²University of Manchester, United Kingdom; ³University of Southampton, United Kingdom

B3P-M14**SENSOR DESIGN FOR WATER HARDNESS DETECTION**

Tonmoy Bhattacharjee, Hongrui Jiang, Nader Behdad

University of Wisconsin-Madison, United States

B3P-M15**MYOELECTRIC CONTROL METHOD FOR CONTROLLABLE ELECTROLARYNX**

Katsutoshi Ooe, Reina Kishimoto, Yuya Hasimoto

Daiichi Institute of Technology, Japan

B3P-M16**UTILIZING TACTILE FEEDBACK FOR BIOMIMETIC GRASPING CONTROL IN UPPER LIMB PROSTHESES**

Luke Osborn², Nitish Thakor², Rahul Kaliki¹

¹Infinite Biomedical Technologies, United States; ²Johns Hopkins University, United States

B3P-M17**A NOVEL WIRELESS MOTION SENSOR FOR ANALYZING GOLF SWING**

Zhijian Yin², Haojie Ning², Yoshio Inoue³, Meimei Han¹, Tao Liu^{2,3}

¹INSENCO R&D Lab. Inc., Japan; ²Jiangxi Science & Technology Normal University, Japan; ³Kochi University of Technology, Japan;

2:00 PM - 3:30 PM

B3P-N: OPEN POSTER I

Poster Area - Baltimore AB

Session Chair: Troy Nagle (North Carolina State University, USA)

B3P-N1

REMOTE IDENTIFICATION AND WIRELESS TEMPERATURE SENSING BASED ON UWB PASSIVE CHIPLESS TIME-CODED RFID TAGS WITH LOS AND NLOS SCENARIOS

Mina Wahib¹, Martin Schüßler², Bernd Kubina², Rolf Jakoby²

¹German University in Cairo, Egypt, Egypt; ²Technical University of Darmstadt, Germany

B3P-N2

A WEARABLE SYSTEM FOR NON-INVASIVE BEAT-TO-BEAT BLOOD PRESSURE ESTIMATIONS

Marcus Pietzsch¹, Martin Zimmerling¹, Wolf-Joachim Fischer²

¹Fraunhofer IPMS, Germany; ²TU Dresden, Germany

B3P-N3

NON-INVASIVE ASSESSMENT OF SKIN HYDRATION

Jose Abraham

Kimberly Clark Corporation, United States

B3P-N4

EMBEDDED DAQ SYSTEM FOR SENSOR EVALUATION AND MOBILE AUTARKIC APPLICATIONS IN RESEARCH AND EDUCATION

Roger Heil, Mario Schlösser, Stefan van Waasen, Michael Schiek
ZEA-2, Germany

B3P-N5

PH SENSOR BASED ON LOW-LIGHT FLUORESCENCE DETECTION FOR DIAGNOSIS OF GASTROESOPHAGEAL REFLUX DISEASE

Paul Mintchev, Raymond Turner, Orly Yadid-Pecht

University of Calgary, Canada

B3P-N6

USING MACHINE OLFACTION TO ASSIST HUMAN ODOR PANELS

Susan Schiffman, Troy Nagle

North Carolina State University, United States

B3P-N7

MOS TUNNELING CURRENT SENSING FOR RESONANT SENSORS

Li Zhu, Bryan Snatchko, Shamus McNamara

University of Louisville, United States

B3P-N8

A NON-INVASIVE ACTIVE DRY ELECTRODE FOR WIRELESS HUMAN-TO-COMPUTER INTERFACING

Jeong A Lee¹, Olufemi Adeluyi¹, Kiseon Kim²

¹Chosun University, Nigeria; ²GIST, Korea, South

B3P-N9

MONITORING YOUTH SOCCER PLAYER PERFORMANCE TO REDUCE INJURY AND OPTIMA SUBSTITUTION STRATEGIES

Phil Attoh-Okine¹, Yaw Adu-Gyamfi²

¹Archmere Academy, United States; ²University of Virginia, United States

3:30 PM - 5:00 PM

B4L-A: CARBON NANOTUBES & GRAPHENE

Maryland F

**Session Chairs: EH Yang (Stevens Institute of Technology, USA),
Joan Hoffmann (Johns Hopkins University, USA)**

3:30 PM

**INVITED TALK: ULTRANANOCRYSTALLINE DIAMOND: NEW
OPPORTUNITIES FOR THE FABRICATION OF NOVEL SENSORS**

Anirudha V. Sumant

Argonne National Laboratory, United States

4:00 PM

CNT SENSOR ARRAYS WITH P-I-N DIODES

Thomas Charisoulis², Abbas Jamshidi-Roudbari², Nack-Bong Choi²,
Miltos Hatalis², Yijiang Lu¹, Jing Li¹

¹NASA Ames Research Center, United States; ²Lehigh University,
United States

4:15 PM

**PT-FUNCTIONALIZED GRAPHENE/SI HETEROSTRUCTURE FOR
HYDROGEN SENSING**

Ahsan Uddin, Amol Singh, Tangali Sudarshan, Goutam Koley

University of South Carolina, United States

4:30 PM

GAS SENSING BY GRAPHENE/SILICON HETROSTRUCTURE

Amol Singh, Ahsan Uddin, Tangali Sudarshan, Goutam Koley

University of South Carolina, United States

4:45 PM

**TUNABLE GRAPHENE/INDIUM NITRIDE HETEROSTRUCTURE
DIODE SENSOR**

Alina Wilson², Ifat Jahangir², Amol Singh², Nick Sbrockey¹, Elane
Coleman¹, Gary Tompa¹, Goutam Koley²

¹Structured Materials Industries, Inc., United States; ²University of
South Carolina, United States

3:30 PM - 5:00 PM

B4L-B: INTEGRATION

Maryland E

**Session Chairs: Hongrui Jiang (University of Wisconsin -
Madison, USA), Babak Ziaie (Purdue University, USA)**

INVITED TALK: 3:30 PM

**CARBON-NANOTUBE BASED FLEXIBLE ELECTRODES FOR
RETINAL RECORDING AND STIMULATION**

Moshe David-Pur, Lilach Bareket-Keren, Giora Beit-Yaakov, Dorit Raz-
Prag, David Rand, Yael Hanein

Tel-Aviv University, Israel

4:00 PM

**MULTIPLE SENSOR ARRAYS FOR SINGLE CELL METABOLIC
ANALYSIS**

Ganquan Song, Rishabh Shetty, Haixin Zhu, Shashanka Ashili, Liqiang
Zhang, Grace Kim, Andrew Shabilla, Wacey Teller, Qian Mei,
Laimonas Kelbauskas, Yanqing Tian, Hong Wang, Roger H. Johnson,
Deirdre R. Meldrum

Arizona State University, United States

4:15 PM

FABRICATION OF MICRODEVICES FOR SEPARATION OF CIRCULATING TUMOR CELL USING LATERAL MAGNETOPHORESIS AND IMMUNOMAGNETIC NANOBeadS

Dae-Sik Lee, Jeong Won Park, Nae-Lim Lee, Mun Yeon Jung, Sung-Mok Cho

Electronics Telecommunications Research Institute (ETRI), Korea, South

4:30 PM

A LOW POWER AUTO-RECONFIGURABLE PIPELINED ADC FOR IMPLANTABLE BIOMEDICAL APPLICATIONS

Terence Randall, Ifana Mahbub, Syed Kamrul Islam

University of Tennessee, Knoxville, United States

4:45 PM

A NEW GAS SENSOR OF A THIN-FILM DIODE AND LOW-POWER, AREA-EFFICIENT READOUT CIRCUIT

Hung-Che Chen, Paul C.-P. Chao, Wei-Chu Lin, Hsiang-Fang Sun, Ming-Zhi Dai, Hsiao-Wen Zan

National Chiao Tung University, Taiwan

3:30 PM - 5:00 PM

B4L-C: PRESSURE SENSORS

Maryland A

Session Chairs: Bernhard Jakoby (Johannes Kepler University Linz, Austria), Paddy French (TU Delft, The Netherlands)

3:30 PM

A WIRELESS PRESSURE SENSOR BASED ON SURFACE TRAPPED FERROFLUID PLUG

Albert Kim, Babak Ziaie, Girish Chitnis

Purdue University, United States

3:45 PM

A MONOCRYSTALLINE ABSOLUTE PRESSURE SENSOR WITH A PSEUDO-MOSFET READ-OUT DEVICE FOR LIFE-SCIENCE APPLICATIONS

Sven Ebschke, Remigius Poloczek, Klaus Kallis, Horst Fiedler

TU Dortmund, Germany

4:00 PM

DISTRIBUTED PIEZOELECTRIC THIN FILM SENSOR ARRAY FOR MONITORING IMPACT EVENTS

Sudeep Joshi, Manjunath M Nayak, Konandur Rajanna

Indian Institute of Science, India

4:15 PM

WEARABLE AND FLEXIBLE PEDOBAROGRAPHIC INSOLE FOR CONTINUOUS PRESSURE MONITORING

Stefano Stassi^{1,2}, Giancarlo Canavese¹, Valentina Cauda¹, Carmelo Fallauto², Simone Corbellini², Paolo Motto², Danilo Demarchi¹, Candido Fabrizio Pirri^{1,2}

¹*Istituto Italiano di Tecnologia, Italy;* ²*Politecnico di Torino, Italy*

4:30 PM

ALL-ELASTOMER IN-PLANE MEMS CAPACITIVE TACTILE SENSOR FOR NORMAL FORCE DETECTION

Alexi Charalambides, Sarah Bergbreiter
University of Maryland, United States

3:30 PM - 5:00 PM

B4L-D: INERTIAL SYSTEMS MODELING

Maryland D

Session Chair: Qing-An Huang (Southeast University, China)

3:30 PM

EFFECTS OF IMPERFECTIONS ON SOLID-WAVE GYROSCOPE DYNAMICS

Erdal Yilmaz, David Bindel
Cornell University, United States

3:45 PM

ADVANCED METHODS FOR CALCULATING QUADRATURE ERRORS OF MEMS GYROSCOPES

Steven Kehrberg², Markus Dorwarth², Markus Heitz², Carsten Geckeler², Jan Mehner¹
¹*Chemnitz University of Technology, Germany*; ²*Robert Bosch GmbH, Germany*

4:00 PM

EUTECTIC TRIMMING OF POLYSILICON MICRO HEMISPHERICAL RESONATING GYROSCOPE

Benoit Hamelin, Vahid Tavassoli, Farrokh Ayazi
Georgia Institute of Technology, United States

4:15 PM

AN IN-SITU MEASUREMENT METHOD FOR THERMALLY INDUCED PACKAGING STRESS IN DISTRIBUTED RF MEMS PHASE SHIFTERS

Cheng Zhao, Jing Song, Lifeng Wang, Lei Han, Qing-An Huang
Southeast University, China

4:30 PM

IMPACT OF MECHANICAL STRESS ON BIPOLAR TRANSISTOR CURRENT GAIN AND EARLY VOLTAGE

Richard Jaeger, Safina Hussain, Jeffrey Suhling, Parameshwaran Gnanachchelvi, Bogdan Wilamowski, Michael Hamilton
Auburn University, United States

4:45 PM

A PERFECT ELECTROSTATIC ANTI-SPRING

Shai Shmulevich, Inbar Hotzen, David Elata
Technion - Israel Institute of Technology, Israel

3:30 PM - 5:00 PM

B4L-E: WIRELESS SENSOR NETWORKS FOR ENVIRONMENTAL MONITORING

Watertable ABC

Session Chair: Hong Yu (Arizona State University, USA)

3:30 PM

QUANTIFYING SPATIAL DISTRIBUTION OF SOIL MOISTURE USING A COSMIC RAY AND CAPACITANCE SENSOR NETWORK

Auro Almeida¹, Craig Baillie¹, Dale Worledge¹, Philip Smethurst¹, Ritaban Dutta¹, Andrew Terhorst¹, Trenton Franz²

¹*Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia;* ²*University of Arizona, United States*

3:45 PM

BACKSCATTER SENSOR NETWORK FOR EXTENDED RANGES AND LOW COST WITH FREQUENCY MODULATORS: APPLICATION ON WIRELESS HUMIDITY SENSING

Eleftherios Kampianakis, John Kimionis, Konstantinos Tountas, Christos Konstantopoulos, Eftichios Koutroulis, Aggelos Bletsas
Technical University of Crete, Greece

4:00 PM

QUAD-TREE APPROACH FOR OBSTACLE DISCOVERY AND TRACKING IN WIRELESS SENSOR NETWORKS

Prasenjit Chanak, Tuhina Samanta, Indrajit Banerjee
Bengal Engineering and Science University, Shibpur, India

4:15 PM

DETECTION OF TARGETS USING DISTRIBUTED MULTI-MODAL SENSORS WITH CORRELATED OBSERVATIONS

Thyagaraju Damarla², Asif Mehmood¹

¹*Booz Allen Hamilton, United States;* ²*US Army Research Laboratory, United States*

4:30 PM

ACCURATE AND EARLY DETECTION OF LOCALIZED HEAVY RAIN BY INTEGRATING MULTIVENDOR SENSORS IN VARIOUS INSTALLATION ENVIRONMENTS

Kei Hiroi¹, Yoshihito Seto², Futoshi Matsumoto², Yuzo Taenaka³, Hideya Ochiai⁴, Haruo Ando², Hitoshi Yokoyama², Masaya Nakayama³, Hideki Sunahara¹

¹*Keio University, Japan;* ²*Tokyo Metropolitan Research Institute for Environmental Protection, Japan;* ³*University of Tokyo, Japan;* ⁴*VLSI Design and Education Center, University of Tokyo, Japan*

4:45 PM

STRUCTURAL DAMAGE DETECTION OF NUCLEAR REACTOR SITES USING SENSOR NETWORKS

Sainath Chidambar Munavalli, Niki Pissinou, Leonel Lagos, Xinyu Jin
Florida International University, United States

3:30 PM - 5:00 PM

B4L-F: MEDICAL APPLICATIONS

Homeland

Session Chair: Elfed Lewis (University of Limerick, Ireland)

3:30 PM

AN EMG BIOFEEDBACK DEVICE FOR VIDEO GAME USE IN FOREARM PHYSIOTHERAPY

Hayes Converse, Teressa Ferraro, Daniel Jean, Laura Jones, Vikas Mendhiratta, Emily Naviasky, Mang Par, Thomas Rimlinger, Steven Southall, Jason Sprenkle, Pamela Abshire

University of Maryland, United States

3:45 PM

HALL-EFFECT MAGNETIC TRACKING DEVICE FOR MAGNETIC RESONANCE IMAGING

Jean-Bapstiste Schell, Loic Cuvillon, Daniel Gounot, Elodie Breton, Jean-Baptiste Kammerer, Luc Hébrard, Michel de Mathelin

Université de Strasbourg (CNRS), France

4:00 PM

BIOPSY ANALYSIS USING A QUADRUPLE INFRARED SENSOR

Valeria Fioravanti², Emanuel Weber², Sander van Den Driesche², Michael Johannes Vellekoop², Daniela Pucciarelli¹, Heimo Breiteneder¹, Christine Hafner¹

¹Medical University of Vienna, Austria; ²University of Bremen, Germany

4:15 PM

QUANTIFICATION OF EDEMA IN HUMAN BRAIN TISSUE BY DETERMINATION OF ELECTROMAGNETIC PARAMETERS

Tobias Reinecke², Lars Hagemeyer¹, Verena Schulte², Michael Klintschar¹, Stefan Zimmermann²

¹Hannover Medical School, Germany; ²Leibniz University Hannover, Germany

4:30 PM

CHARACTERISATION OF RADIOLUMINESCENCE BASED OPTICAL FIBRE DOSIMETER IN RADIOTHERAPY BEAM APPLICATIONS

Peter Woulfe^{2,3}, Sinead O'Keeffe³, Denis McCarthy³, Mark Grattan¹, Alan Hounsell¹, John Cronin², Elfed Lewis³

¹Belfast City Hospital, United Kingdom; ²Galway Clinic, Ireland;

³University of Limerick, Ireland

4:45 PM

IDENTIFICATION OF DIFFERENT RESPIRATORY RATE BY A PIEZO POLYMER BASED NASAL SENSOR

Roopa G. Manjunatha, N. Ranjith, Y.V. Meghashree, Konandur Rajanna, D. Roy Mahapatra

Indian Institute of Science, India

WEDNESDAY, NOVEMBER 6TH

8:00 AM - 8:45 AM

PLENARY – KEYNOTE – DR. KENNETH S. JOHNSON: BIOARGO: A GLOBAL SCALE CHEMICAL SENSOR NETWORK TO OBSERVE CARBON, OXYGEN, AND NITROGEN CYCLES IN THE OCEAN
Maryland BC

Session Chair: Yogesh Gianchandani (University of Michigan, Ann Arbor, USA)

8:00 AM

BIOARGO: A GLOBAL SCALE CHEMICAL SENSOR NETWORK TO OBSERVE CARBON, OXYGEN, AND NITROGEN CYCLES IN THE OCEAN

Kenneth S. Johnson

Monterey Bay Aquarium Research Institute, United States

9:00 AM - 10:15 AM

C1L-A: ELECTROCHEMICAL SENSORS

Maryland F

Session Chairs: Joannis Raptis (NCSR Demokritos, Greece),
Babak Ziaie (Purdue University, USA)

9:00 AM

ACOUSTIC TWEEZERS: MANIPULATING PARTICLES, CELLS, AND ORGANISMS USING STANDING SURFACE ACOUSTIC WAVES (SSAW)

Tony Jun Huang

Pennsylvania State University, United States

9:30 AM

MICROSTRUCTURING CONDUCTING POLYMERS AND MOLECULARLY IMPRINTED POLYMERS BY LIGHT-ACTIVATED ELECTROPOLYMERIZATION ON MICROMACHINED SILICON. APPLICATIONS IN ELECTROCHEMICAL SENSING

Elisabetta Mazzotta¹, Cosimino Malitesta¹, Salvo Surdo², Giuseppe Barillaro²

¹Università del Salento, Italy; ²Università di Pisa, Italy

9:45 AM

SCALE-DOWN EFFECTS: TOWARDS MINIATURIZATION OF AN ELECTROCHEMICAL SENSOR USING BIOMOLECULES

Faheng Zang, Xiao Zhu Fan, Konstantinos Gerasopoulos, Hadar Ben-Yoav, Adam Brown, James Culver, Reza Ghodssi

University of Maryland, United States

10:00 AM

ULTRA-HIGH SCANNING SPEED CHEMICAL IMAGE SENSOR BASED ON LIGHT ADDRESSABLE POTENTIOMETRIC SENSOR WITH ANALOG MICRO-MIRROR

Anirban Das, Tsung-Cheng Chen, Yi-Ting Lin, Chao-Sung Lai, Yuan-Hui Liao, Chia-Ming Yang

Chang Gung University, Taiwan

9:00 AM - 10:15 AM

C1L-B: POWER APPLICATIONS

Maryland E

**Session Chairs: Mitsuhiro Shikida (Nagoya University, Japan),
Ruby Ghosh (Michigan State University, USA)**

9:00 AM

**DEVELOPMENT OF A THIN-FILM THERMOCOUPLE MATRIX FOR
IN-SITU TEMPERATURE MEASUREMENT IN A LITHIUM ION
POUCH CELL**

Nora Martiny², Jan Geder², Yuxi Wang², Werner Kraus¹, Andreas
Jossen¹

¹Technical University of Munich, Germany; ²TUM CREATE, Singapore

9:15 AM

**A FLUIDIC MICROENERGY GENERATOR ENABLED BY HYBRID
NANOMATERIAL NANOFUIDS**

Yuan He, Shiva Vasiraju, Long Que

Louisiana Tech University, United States

9:30 AM

**ACHIEVING MAXIMUM POWER EFFICIENCY OF A NOVEL
RECTIFIER CHARGE PUMP BY IMPEDANCE MATCHING IN AN
ENERGY HARVESTER SUITED FOR SELF-POWERED SENSORS**

Paul C.-P. Chao, Chao-Te Chiang, Tzu-Chia Huang, Chun-Kai Chang
National Chiao Tung University, Taiwan

9:45 AM

**HIGH-VOLTAGE GENERATION USING A CMOS IMAGE SENSOR
WITH DUAL PHOTO-SENSING AND ENERGY HARVESTING
CAPABILITIES**

Hsuan-Tsung Wang², Walter Leon-Salas¹

¹Purdue University, United States; ²University of Missouri-Kansas City,
United States

10:00 AM

**A SELF-POWERED PHOTODIODE SWITCH DETECTS ONLY
RISING EDGE OF INFRARED-LIGHT PULSE FOR WIRELESS
ZERO-STANDBY-POWER WAKE-UP RECEIVER**

Fumiyasu Utsunomiya, Ami Tanaka, Takakuni Douseki

Ritsumeikan University, Japan

9:00 AM - 10:15 AM

C1L-C: VISCOSITY, DENSITY AND FLOW SENSORS

Maryland A

Session Chair: Patrick Ruther (University of Freiburg, Germany)

9:00 AM

**EXPERIMENTAL AND THEORETICAL EVALUATION OF THE
ACHIEVABLE ACCURACIES OF RESONATING VISCOSITY AND
MASS DENSITY SENSORS**

Martin Heinisch, Thomas Voglhuber-Brunnmaier, Erwin K. Reichel,
Bernhard Jakoby

Johannes Kepler University, Austria

9:15 AM

VISCOSITY AND DENSITY SENSOR PRINCIPLE BASED ON DIAMAGNETIC LEVITATION USING PYROLYTIC GRAPHITE

Stefan Clara, Hannes Antlinger, Wolfgang Hilber, Bernhard Jakoby
Johannes Kepler University, Austria

9:30 AM

MODELING APPROACHES FOR ELECTRODYNAMICALLY DRIVEN VISCOSITY AND MASS DENSITY SENSORS OPERATED IN THE KHZ RANGE AND EXPERIMENTAL VERIFICATIONS

Martin Heinisch, Thomas Voglhuber-Brunnmaier, Erwin K. Reichel, Bernhard Jakoby
Johannes Kepler University, Austria

9:45 AM

LOW PRESSURE SPHERICAL THERMAL ANEMOMETER FOR SPACE MISSIONS

Lukasz Kowalski, Vicente Jiménez, Manuel Domínguez-Pumar, Sergi Gorreta, Santiago Silvestre, Luis Castañer
Universitat Politècnica de Catalunya (UPC), Spain

10:00 AM

A NEW METHOD FOR THE VELOCITY MEASUREMENT OF GAS-LIQUID TWO-PHASE FLOW

Ying Zhou, Zhiyao Huang, Baoliang Wang, Haifeng Ji, Haiqing Li
ZheJiang University, China

9:00 AM - 10:15 AM

C1L-D: OPTICAL IMAGING SENSORS

Maryland D

Session Chairs: John X.J. Zhang (University of Texas at Austin, USA), Michiel Vellekoop (University of Bremen - IMSAS, Germany)

9:00 AM

TRENDS IN SMALL-FORMAT INFRARED ARRAY SENSORS

Masafumi Kimata
Ritsumeikan University, Japan

9:30 AM

A HIGH-SPEED POLAR-SYMMETRIC IMAGER FOR REAL-TIME CALIBRATION OF ROTATIONAL INERTIAL SENSORS

Ben Johnson, Changhyuk Lee, Sriram Sivaramakrishnan, Al Molnar
Cornell University, United States

9:45 AM

A COMBINED TACTILE AND PROXIMITY SENSING EMPLOYING A COMPOUND-EYE CAMERA

Kazuhiro Shimonomura, Hiroto Nakashima
Ritsumeikan University, Japan

10:00 AM

CMOS SENSOR FOR SUN TRACKING

Hongyi Wang², Tao Luo¹, Hongjiang Song¹, Jennifer Blain Christen¹
¹Arizona State University, United States; ²Xi'an Jiaotong University, China

9:00 AM - 10:15 AM

C1L-E: WIRELESS SENSOR NETWORKS FOR TARGETS & OBJECTS

Watertable ABC

Session Chairs: Geoffrey Cranch, Tracie Severson (US Naval Academy, USA)

9:30 AM

ITERATIVE INTERFERENCE MANAGEMENT IN CODED PASSIVE WIRELESS SENSORS

Ali Abedi², Kristen Zyck¹

¹University of Florida, United States; ²University of Maine, United States

9:45 AM

DISTRIBUTED MULTI-TARGET SEARCH AND TRACK ASSIGNMENT USING CONSENSUS-BASED COORDINATION

Tracie Severson, Derek Paley

University of Maryland, United States

10:00 AM

TOWARDS A PERPETUAL WIRELESS SENSOR NODE

Ariton Xhafa¹, Bradford Campbell², Srinath Hosur¹

¹Texas Instruments, Inc., United States; ²University of Michigan, United States

9:00 AM - 10:15 AM

C1L-F: MATERIALS & FABRICATION II

Homeland

Session Chairs: Tao Li (University of Michigan, USA), Eugene Hwang (Analog Devices, USA)

9:00 AM

TITANIUM NITRIDE (TIN) AS A GATE MATERIAL IN BICMOS DEVICES FOR BIOMEDICAL IMPLANTS

Nishant Lawand², Henk van Zeijl², Paddy French², Jeroen Briaire¹, Johan Frijns¹

¹Leiden University Medical Centre, Netherlands; ²Delft University of Technology, Netherlands

9:15 AM

A CMOS-COMPATIBLE METAMATERIAL TO ENHANCE THE FRONT TO BACK RADIATION RATIO IN TERAHERTZ ANTENNA FOR SENSING APPLICATION

Giuseppe Fiorentino, Waqas Syed, Fabio Santagata, Marco Spirito, Gregory Pandraud, Andrea Neto, Pasqualina M. Sarro, Aurele J.L. Adam

Technische Universiteit Delft, Netherlands

9:30 AM

POLYCRYSTALLINE DIAMOND CIRCULAR RESONANT DIAPHRAGMS WITH LOW ONSET OF NONLINEAR RESPONSE

Andrew Barnes, Christian Zorman

Case Western Reserve University, United States

9:45 AM

**NOVEL IMPEDANCE MATCHING MATERIALS AND STRATEGIES
FOR AIR-COUPLED PIEZOELECTRIC TRANSDUCERS**

Tomas Gómez Álvarez-Arenas, Luis Díez
Spanish National Research Council (CSIC), Spain

10:00 AM

**DESIGN AND IMPLEMENTATION OF COLLAGEN-BASED
CAPACITIVE RELATIVE HUMIDITY SENSORS**

Steven Shapardanis, Mathew Hudspeth, Tolga Kaya
Central Michigan University, United States

WEDNESDAY, NOVEMBER 6TH – POSTER SESSION

10:15 AM - 12:15 PM

C2P-G: CHEMICAL & GAS SENSORS V

Poster Area - Baltimore AB

Session Chairs: Giuseppe Barillaro (University of Pisa, Italy), EH Yang (Stevens Institute of Technology, USA)

C2P-G1

N719-DYE SENSITIZED AMORPHOUS ZINC OXIDE FILMS FOR NO₂ DETECTION UNDER VISIBLE-LIGHT ILLUMINATION

Chao Zhang, Marjorie Olivier, Marc Debliquy
University of Mons, Belgium

C2P-G2

ODOR SPATIAL DISTRIBUTION VISUALIZED BY A FLUORESCENT IMAGING SENSOR

Chuanjun Liu, Ryohei Yokoyama, Seiichi Uchida, Koji Nakano, Kenshi Hayashi
Kyushu University, Japan

C2P-G3

GAS SENSING STUDIES OF AN N-N HETEROJUNCTION METAL OXIDE SEMICONDUCTOR SENSOR ARRAY BASED ON WO₃ AND ZNO COMPOSITES

Anupriya Naik², Ivan Parkin², Russell Binions¹
¹*Queen Mary University of London, United Kingdom;* ²*University College London, United Kingdom*

C2P-G4

INVESTIGATION OF SH-SAW SENSORS FOR TOXIC HEAVY METAL DETECTION

Zeinab Ramshani, Binu Baby Narakathu, Sepehr Emamian, Sai Guruva Reddy Avuthu, Massood Zandi Atashbar
Western Michigan University, United States

C2P-G5

TOWARDS THE REALIZATION OF A MEMS-BASED PHOTOACOUSTIC CHEMICAL SENSOR USING ULTRACOMPACT EC-QCL (SPRITEIR)

Ellen Holthoff, Logan Marcus, Paul Pellegrino
US Army Research Laboratory, United States

C2P-G6

DIELECTRIC POWDER CHARACTERIZATION BY RADIO FREQUENCY MEASUREMENTS TECHNIQUE FOR HYDROGEN SENSOR APPLICATIONS: APPLICATION TO IRON OXIDE

Naimi Boubekeur, Hatem El Matbouly, Frederic Domingue
Université du Québec à Trois-Rivières, Canada

C2P-G7

FUNCTIONALIZED SINGLE ZNO-METAL JUNCTION AS A PH SENSOR

Paolo Motto², Valentina Cauda¹, Stefano Stassi², Giancarlo Canavese², Danilo Demarchi^{1,2}
¹*Istituto Italiano di Tecnologia, Italy;* ²*Politecnico di Torino, Italy*

C2P-G8**CALIBRATION OF SMALL RESISTIVE COMMERCIAL SENSORS TO MEASURE OZONE WITH THE INTERFERENCE OF TEMPERATURE AND HUMIDITY**

Manuel Aleixandre¹, Maria Del Carmen Horrillo¹, Michel Gerboles², Laurent Spinellet²

¹ITEFI-CSIC, Spain; ²Joint Research Centre, Italy

C2P-G9**CU2O BASED ELECTROCHEMICAL SENSOR FOR DIRECT GLUCOSE DETECTION**

Petra Majzlikova¹, Jan Prasek, Jana Chomoucka¹, Jana Drbohlavova¹, Jan Pekarek¹, Radim Hrdy¹, Jaromir Hubalek¹, Libuse Trnkova²

¹Brno University of Technology, Czech Republic; ²Masaryk University, Czech Republic

C2P-G10**ATOMIC LAYER DEPOSITED TiO2 THIN FILMS FOR ENVIRONMENTAL GAS SENSING**

Steven Mills, Bongmook Lee, Veena Misra

North Carolina State University, United States

C2P-G11**SELECTIVE MULTIMODAL GAS SENSING IN EPITAXIAL GRAPHENE BY FOURIER TRANSFORM INFRARED SPECTROSCOPY**

Shamaita Shetu, B. K. Daas, Kevin Daniels, Tangali Sudarshan, Goutam Koley, Mvs Chandrashekar

University of South Carolina, United States

C2P-G12**POLYNUCLEOTIDE-FUNCTIONALIZED GOLD NANOPARTICLES AS CHEMIREISTIVE VAPOR SENSING ELEMENTS**

Kan Fu², Wyatt Pedrick², Han Wang², Andrew LaMarche², Xiaoqiang Jiang², Brian Willis², Shihui Li¹, Yong Wang¹

¹Pennsylvania State University, United States; ²University of Connecticut, United States

10:15 AM - 12:15 PM

C2P-H: APPLICATIONS II

Poster Area - Baltimore AB

Session Chair: David Horsley (University of California, Davis, USA)

C2P-H1**A CMOS INTELLIGENT LIGHT SENSING CHIP FOR AUTOMATIC BRIGHTNESS TUNING APPLICATIONS**

Cheng-Ta Chiang, Jia-Yao Liou

National Chia Yi University, Taiwan

C2P-H2**DUAL SIX-PORT BASED DIRECTION-OF-ARRIVAL DETECTOR FOR FMCW RADAR TRACKING IN THE ISM BAND AT 24 GHZ**

Gabor Vinci², Stefan Lindner¹, Sebastian Mann¹, Francesco Barbon¹, Robert Weigel¹, Alexander Koelpin¹

¹University of Erlangen-Nuremberg Germany; ²InnoSenT GmbH, Germany

C2P-H3**A WIRELESS LASER SENSOR WEB FOR HUMAN GAIT DISORDER RECOGNITION BASED ON THE BUFFONS NEEDLE MODEL**

Rui Ma, Qi Hao

University of Alabama, United States

C2P-H4**SUPERVISED MACHINE LEARNING SCHEME FOR TRI-AXIAL ACCELEROMETER-BASED FALL DETECTOR**

Alessandro Leone, Gabriele Rescio, Pietro Siciliano

CNR-Institute for Microelectronics and Microsystems, Italy

C2P-H5**MOBILE APPLICATION BASED SUSTAINABLE IRRIGATION WATER USAGE DECISION SUPPORT SYSTEM: AN INTELLIGENT SENSOR CLOUD APPROACH**

Cecil Li¹, Ritaban Dutta¹, Corné Kloppers¹, Claire D'Este¹, Ahsan Morshed¹, Auro Almeida¹, Aruneema Das², Jagannath Aryal²

¹Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia; ²University of Tasmania, Australia

C2P-H6**ROCK COLLAPSE FORECASTING: A NOVEL APPROACH BASED ON THE CLASSIFICATION OF MICRO-ACOUSTIC SIGNALS IN THE WAVELET DOMAIN**

Stavros Ntalampiras, Manuel Roveri

Politecnico di Milano, Italy

C2P-H7**S³MD, STRESS SENSITIVE SURFACE MOUNTED DEVICES FOR IN-SITU MONITORING OF MECHANICAL PROCESSES IN PCB MANUFACTURING**

Soeren Majcherek, Soeren Hirsch, Bertram Schmidt

Otto-von-Guericke-University Magdeburg, Germany

C2P-H8**SELF-POWERED WIRELESS DIGITAL TACHOMETER SCHEME WITHOUT SENSORS FOR MEASURING SPIN OF YO-YO**

Itaru Asakura, Ami Tanaka, Hisashi Nishikawa, Takakuni Douseki

Ritsumeikan University, Japan

C2P-H9**SELF-POWERED WIRELESS DIGITAL TACHOMETER SCHEME WITHOUT SENSORS FOR MEASURING SPIN OF YO-YO**

Itaru Asakura, Ami Tanaka, Hisashi Nishikawa, Takakuni Douseki

Ritsumeikan University, Japan

C2P-H10**DETECTION OF TATP PRECURSORS WITH MOX GAS SENSORS COMBINED WITH SOLID PHASE MICRO EXTRACTION**

Jesús Lozano, José Ignacio Suárez, José Manuel Ordiales, Teodoro Aguilera

University of Extremadura, Spain

C2P-H11

PARTICLE FILTERING TO IMPROVE THE DYNAMIC ACCURACY OF ELECTROMAGNETIC TRACKING

Hasan Sen, Peter Kazanzides
Johns Hopkins University, United States

C2P-H12

COMPARATIVE STUDY OF MOISTURE MEASUREMENTS BY TIME DOMAIN TRANSMISSOMETRY

Bianca Will, Ilona Rolfes
Ruhr-University Bochum, Germany

C2P-H13

WATER VELOCIMETER AND TURBIDITY-METER USING VISIBLE LIGHT COMMUNICATION MODULES

Cheng-Chun Chang², Chien-Ta Wu², Yung-Bin Lin¹, Meng-Huang Gu¹
¹*National Center for Research on Earthquake Engineering, Taiwan;*
²*National Taipei University of Technology, Taiwan*

C2P-H14

WEARABLE MULTI-SENSOR GESTURE RECOGNITION FOR PARALYSIS PATIENTS

Alexander Nelson², Prashanth Shyamkumar¹, William Wilkins¹, David Lachut², Nilanjan Banerjee², Sami Rollins³, James Parkerson¹, Vijay Varadan¹
¹*University of Arkansas, United States;* ²*University of Maryland, Baltimore County, United States;* ³*University of San Francisco, United States*

C2P-H15

A WIRELESS-ENABLED SENSOR SYSTEM FOR DISTRIBUTED RADIATION DETECTION ON ANDROID CELLPHONES

Yu Sui, Tao Li
University of Michigan, United States

10:15 AM - 12:15 PM

C2P-J: FLUIDIC AND MISCELLANEOUS SENSORS

Poster Area - Baltimore AB

Session Chair: Babak Ziaie (Purdue University, USA)

C2P-J1

METALLIC AND CERAMIC THIN FILM THERMOCOUPLES FOR GAS TURBINE ENGINE APPLICATIONS

Ian Tougas, Otto Gregory
University of Rhode Island, United States

C2P-J2

AIRBORNE ULTRASONIC SENSOR NODE FOR DISTANCE MEASUREMENT

Enrique A. Vargas Cabral, Isidro Valdez
Catholic University Asuncion, Paraguay

C2P-J3**TEMPERATURE-COMPENSATED CATHETER FLOW SENSOR AND ITS APPLICATION TO BREATHING MEASUREMENT IN A MOUSE**

Takayuki Yamada, Yudai Yamazaki, Takuya Matsuyama, Mitsuhiro Shikida, Miyoko Matsushima, Tsutomu Kawabe
Nagoya University, Japan

C2P-J4**ORBITING SPHERE VISCOMETER OPERATED IN RESONANT ORBITING MODE**

Stefan Clara, Hannes Antlinger, Wolfgang Hilber, Bernhard Jakoby
Johannes Kepler University, Austria

C2P-J5**PROPOSAL OF SHEAR STRESS SENSOR BASED ON OPTICAL DETECTION**

Yuta Eto, Syunji Shibata, Mitsuhiro Shikida
Nagoya University, Japan

C2P-J6**PARAMETRIC AMPLIFICATION IN A MICRO CORIOLIS MASS FLOW SENSOR: REDUCTION OF POWER DISSIPATION WITHOUT LOSS OF SENSITIVITY**

Jarno Groenesteijn, Harmen Droogendijk, Remco Wiegerink, Theo S. J. Lammerink, Joost Lötters, Remco Sanders, Gijs J.M Krijnen
University of Twente, Netherlands

C2P-J7**WIDE SPAN THERMAL WIND SENSOR SYSTEM WITH DUAL CHIPS**

Lin Zhou, Sheng-Qi Cheng, Tian-Yu Xiang, Ming Qin, Bei Chen, Qing-An Huang
Southeast University, China

C2P-J8**A NEW SENSOR FOR THE VOID FRACTION MEASUREMENT OF GAS-LIQUID TWO-PHASE FLOW**

Ya Chang, Zhiyao Huang, Baoliang Wang, Haifeng Ji, Haiqing Li
ZheJiang University, China

C2P-J9**GAS CONCENTRATION AND FLOW SPEED MEASUREMENTS USING A POLYMER-BASED MEMBRANE SENSOR**

Christoph Hepp¹, Florian Krogmann¹, Gerald Urban²
¹*Innovative Sensor Technology IST AG, Switzerland;* ²*University of Freiburg, Germany*

C2P-J10**ENERGY-EFFICIENT, 0.1 NJ/CONVERSION TEMPERATURE SENSOR WITH TIME-TO-DIGITAL CONVERTER AND 1 °C ACCURACY IN -6 TO 64 °C RANGE**

Oleg Nizhnik¹, Kohei Higuchi¹, Kazusuke Maenaka¹, Travis Bartley²
¹*Japan Science and Technology Agency, Japan;* ²*Tohoku University, Japan*

C2P-J11**PAPER-BASED MEMS HAIR CELL ARRAY**

Kevin Crowley, Diana Nakidde, Jeffrey Travis, Masoud Agah
Virginia Tech, United States

C2P-J12**MICROWAVE DOPPLER FLOW SENSOR FOR CHEMICAL LOOPING COMBUSTION SYSTEMS**

David Greve¹, Irving Oppenheim¹, Benjamin Chorpening², Jared Charley^{2,3}

¹*Carnegie Mellon University, United States;* ²*National Energy Technology Laboratory, United States;* ³*URS Corporation, United States*

10:15 AM - 12:15 PM

C2P-K: OPTICAL SENSORS II

Poster Area - Baltimore AB

Session Chairs: Carlos Ruiz-Zamarreno (Universidad Publica de Navarra, Spain), Ignacio R. Matias (Universidad Publica de Navarra, Spain)

C2P-K1**TEMPERATURE EFFECTS IN CHROMATIC CONFOCAL DISTANCE SENSORS**

Garry Berkovic, Shlomo Zilberman, Ehud Shafir
Soreq NRC, Israel

C2P-K2**AN EVENT-DETECTION HIGH DYNAMIC RANGE CMOS IMAGE SENSOR**

Gözen Köklü, Dechao Sun, Yusuf Leblebici, Giovanni De Micheli, Sandro Carrara

Swiss Federal Institute of Technology (EPFL), Switzerland

C2P-K3**DISTRIBUTED TEMPERATURE MONITORING USING OFDR-BASED RAYLEIGH BACKSCATTERING FOR LIQUID SODIUM LEAKAGE DETECTION**

Romain Cotillard¹, Guillaume Laffont¹, Ekaterina Boldyreva¹, Pierre Ferdinand¹, Denis Cambet², Serge Albaladéjo², Pierre Charvet², Jean-Philippe Jeannot², Gilles Rodriguez²

¹*CEA, LIST, France;* ²*CEA, DTN, France*

C2P-K4**OPTOFLUIDIC OUT-OF-PLANE INTERFEROMETER**

Lukas Brandhoff, Michael Johannes Vellekoop
University of Bremen, Germany

C2P-K5**SENSITIVITY ENHANCEMENT OF A HUMIDITY SENSOR BASED ON POLY(SODIUM PHOSPHATE) AND POLY(ALLYLAMINE HYDROCHLORIDE)**

Miguel Hernaez, Diego Lopez-Torres, Cesar Elosua, Ignacio Raul Matías, Francisco Javier Arregui
Public University of Navarra, Spain

C2P-K6**VIBRATION MONITORING WITH A SILICON MICRO-FABRICATED DEVICE COUPLED TO AN OPTICAL FIBER**

Jose Mireles Jr.², Angel Saucedo², Juan Ibarra², Ivan Muñoz², Gustavo Lara², Roberto Ambrosio², Abimael Jimenez², Estrada V. Horacio¹

¹Centro Nacional de Metrologia, Mexico; ²Universidad Autonoma de Ciudad Juarez, Mexico

C2P-K7**DEFECT-ASSISTED PLASMONIC SENSING**

Jayson Briscoe¹, Sang-Yeon Cho¹, Igal Brener²

¹New Mexico State University, United States; ²Sandia National Laboratories, United States

C2P-K8**A 3T LINEAR-LOGARITHMIC CMOS IMAGE SENSOR**

Santosh Koppa, Youngjoong Joo

University of Texas at San Antonio, United States

C2P-K9**A 10.6μM X 10.6μM CMOS SPAD WITH INTEGRATED READOUT**

Khandaker A. Al Mamun, Mohammad Habib, David Bishai, Nicole McFarlane

University of Tennessee, Knoxville, United States

C2P-K10**PLASMONIC AND BOLOMETRIC TERAHERTZ GRAPHENE SENSORS**

Michael Shur², Andrey Muraviev², Sergey Romyantsev², Wojtech Knap³, Guanxiong Liu¹, Alexander Balandin¹

¹University of California, Riverside, United States ²Rensselaer Polytechnic Institute, United States; ³Université Montpellier 2, France

C2P-K11**PORTABLE OPTICAL SENSOR USING TUNABLE OPTICAL MULTILAYERS**

Andras Kovacs, Aina Malisaukaite, Alexey Ivanov, Ulrich Mescheder
Hochschule Furtwangen University, Germany

C2P-K12**IN-FIBER INTERFEROMETERS FOR TEMPERATURE CORRECTED REFRACTIVE INDEX SENSING WITH GUIDED AND LEAKY MODES**

Jeremie Harris, Ping Lu, Hugo Larocque, Liang Chen, Xiaoyi Bao
University of Ottawa, Canada

C2P-K13**DISCRIMINATION OF TEMPERATURE AND AXIAL STRAIN USING DISPERSION EFFECTS OF HIGH-ORDER-MODE FIBERS**

Yanping Xu², Ping Lu^{1,2}, Jia Song², Liang Chen², Xiaoyi Bao², Xiaopeng Dong³

¹National Research Council Canada, Canada; ²University of Ottawa, Canada; ³Xiamen University, China

10:15 AM - 12:15 PM

C2P-L: SENSOR NETWORKS II

Poster Area - Baltimore AB

Session Chairs: Elliott Brown (Wright State University, USA)

C2P-L1

EFFECT OF LOCATION ON THE LATENCY IN CLUSTER-BASED WSNS

Deepa Padmanabhan, Fabrice Labeau

McGill University, Canada

C2P-L2

DEVELOPMENT OF SUSPENDED PLANAR TWO PORT MICRO TRANSFORMER FOR RF WIRELESS APPLICATION

I-Yu Huang, Wen-Hui Huang, Chian-Hao Sun

National Sun Yat-sen University, Taiwan

C2P-L3

A NEW NON-INVASIVE VOLTAGE MEASUREMENT METHOD FOR WIRELESS ANALYSIS OF ELECTRICAL PARAMETERS AND POWER QUALITY

Domenico Balsamo², Danilo Porcarelli², Luca Benini², Davide Brunelli¹

¹University of Trento, Italy; ²University of Bologna, Italy

C2P-L4

PERFORMANCE OF DMSA ALGORITHM IN HYBRID SENSOR NETWORKS

Ariton Xhafa, Xiaolin Lu, Ryan Nuzzaci, Jianwei Zhou

Texas Instruments, Inc., United States

C2P-L5

LIGHTWEIGHT DIGITAL HARDWARE RANDOM NUMBER GENERATORS

Teng Xu, Miodrag Potkonjak

University of California, Los Angeles, United States

C2P-L6

VOLTAGE-BASED ESTIMATION OF RESIDUAL BATTERY ENERGY IN WIRELESS SENSOR SYSTEMS

Jaеung Kim, Dong Kun Noh

Soongsil University, Korea, South

C2P-L7

CLUSTER HEAD LOAD DISTRIBUTION SCHEME FOR WIRELESS SENSOR NETWORKS

Prasenjit Chanak, Tuhina Samanta, Indrajit Banerjee

Bengal Engineering and Science University, Shibpir, India

C2P-L8

DISTRIBUTED CLUSTERING ALGORITHM FOR MOBILE WIRELESS SENSORS NETWORKS

Fatiha Djemili², Wessam Ajib¹, Abdellatif Obaid¹

¹Université du Québec a Montréal, Canada; ²Badji Mokhtar-Annaba University, Algeria

C2P-L9**REGION BASED THREE DIMENSIONAL REAL-TIME ROUTING
PROTOCOL FOR WIRELESS SENSOR NETWORKS**

Sarab Al Rubeaai, Brajendra Singh, Mehmood Abd, Kemal Tepe
University of Windsor, Canada

10:15 AM - 12:15 PM

C2P-M: OTHER SENSORS TOPICS II

Poster Area - Baltimore AB

Session Chair: Goutam Koley (University of South Carolina, USA)

C2P-M1**CALIBRATION OF GRADIOMETER BY SOLVING NONLINEAR
EQUATIONS AND ITS PARAMETERS GENERALITY TEST**

Hongfeng Pang, Mengchun Pan, Jiafei Hu, Dixiang Chen, Feilu Luo
National University of Defense Technology, China

C2P-M2**ANALYSIS OF MECHANICAL STRENGTHENING OF SI
CANTILEVER BY CHEMICAL KOH ETCHING**

Yosuke Niimi, Tatsuya Hasegawa, Tomoaki Sugino, Satoshi Hamaoka,
Kenji Fukuzawa, Mitsuhiro Shikida
Nagoya University, Japan

C2P-M3**STUDY OF NON-SPECIFIC PROTEIN ABSORPTION OF GLUCOSE
SENSORS COATED WITH ELECTRO-POLYMERIZED
ZWITTERIONIC HYDROGEL**

Yichuan Hu, Guang Yang, Bo Liang, Lu Fang, Keda Shi, Xuesong Ye
ZheJiang University, China

C2P-M4**DESIGN AND IMPLEMENTATION OF A SELF-CALIBRATING,
COMPACT MICRO STRIP SENSOR FOR IN-SITU DIELECTRIC
SPECTROSCOPY AND DATA TRANSMISSION**

Gunjan Pandey, Ratnesh Kumar, Robert Weber
Iowa State University, United States

C2P-M5**THE EFFECT OF TRUE HUMAN SYNOVIAL FLUID ON THE
FUNCTIONALITY OF AN IN VIVO PRESSURE SENSOR ELEMENT**

Ingelin Clausen, Lars Geir Whist Tvedt, Sigurd Moe, Andreas Vogl
SINTEF, Norway

C2P-M6**AN EXOTHERMAL ENERGY RELEASE LAYER FOR MICROCHIP
TRANSCIENCE**

Shashank Pandey, Carlos Mastrangelo
University of Utah, United States

C2P-M7**ACOUSTIC AND ELECTRICAL PROPERTIES OF
CA3TAGA3SI2O14 PIEZOELECTRIC RESONATORS AT
ELEVATED TEMPERATURES**

Ward Johnson², Michal Schulz¹, Holger Fritze¹
¹*Clausthal University of Technology, Germany;* ²*National Institute of
Standards and Technology, United States*

C2P-M8**DEEP NLD PLASMA ETCHING OF FUSED SILICA AND BOROSILICATE GLASS**

Mohammed Jalal Ahamed, Doruk Senkal, Alexander Trusov, Andrei Shkel

University of California, Irvine, United States

C2P-M9**LONG-TERM THERMAL MECHANICAL STABILITY OF PECVD AMORPHOUS SILICON CARBIDE FILMS FOR HARSH ENVIRONMENT MICROELECTROMECHANICAL SYSTEMS**

Michael LaBarbera¹, Christian Zorman¹, Maximilian Scardelletti²

¹Case Western Reserve University, United States; ²NASA Glenn Research Center, United States

C2P-M10**TIOX MEMRISTORS WITH VARIABLE TURN-ON VOLTAGE USING FIELD-EFFECT FOR NON-VOLATILE MEMORY**

Pradeep Pai, Faisal Chowdhury, Tien-Vinh Dang-Tran, Massood Tabib-Azar

University of Utah, United States

C2P-M11**MOX GAS SENSORS USING MULTILAYER AEROGEL**

Sanjay Kumar, Mohammad Madani, Mohammad Seyedjalali

University of Louisiana at Lafayette, United States

C2P-M12**A ROBUST VACNF PLATFORM FOR ELECTROCHEMICAL BIOSENSOR**

Khandaker A. Al Mamun², Fahmida S. Tulip², Kimberly MacArthur², Nicole McFarlane², Syed Kamrul Islam², Dale Hensley¹, Ivan I. Kravchenko¹

¹Oak Ridge National Laboratory, United States; ²University of Tennessee, Knoxville, United States

C2P-M13**SHORT-RANGE REMOTE POWERING FOR LONG-TERM IMPLANTED SENSOR SYSTEMS IN FREELY MOVING SMALL ANIMALS**

Enver G. Kilinc¹, Franco Maloberti², Catherine Dehollain¹

¹Ecole Polytechnique Federale de Lausanne, Switzerland; ²Università degli Studi di Pavia, Italy

C2P-M14**POWER-ERROR ANALYSIS OF SENSOR ARRAY REGRESSION ALGORITHMS FOR GAS MIXTURE QUANTIFICATION IN LOW-POWER MICROSYSTEMS**

Yuning Yang, Jinfeng Yi, Rong Jin, Andrew Mason

Michigan State University, United States

C2P-M15**A BULK MICROMACHINED SILICON NEURAL PROBE WITH NANOPOROUS PLATINUM ELECTRODE FOR LOW IMPEDANCE RECORDING**

Yijae Lee, Su Jin Lee, Hyosang Yoon, Jae Young Park

Kwangwoon University, Korea, South

C2P-M16**ENHANCING MEASUREMENT ACCURACY OF POSITION SENSITIVE DETECTOR (PSD) SYSTEMS USING THE KALMAN FILTER AND DISTORTION RECTIFYING**

Yudong Luo, Yantao Shen, Jose Cordero, Josette Zaklit
University of Nevada, Reno, United States

C2P-M17**SPECTRAL ESTIMATION USING DUAL SENSORS WITH UNCORRELATED NOISE**

Andrew Fleming, Brett Ninness, Adrian Wills
University of Newcastle, Australia

C2P-M18**RESOLUTION OF SENSORS WITH CAPACITIVE SOURCE IMPEDANCE**

Yik Ren Teo, Andrew Fleming
University of Newcastle, Australia

10:15 AM - 12:15 PM

C2P-N: OPEN POSTER II

Poster Area - Baltimore AB

Session Chairs: Troy Nagle (North Carolina State University, USA)

C2P-N1**OPTICAL PHASE-SHIFT EFFECTS FROM SURFACE ADSORPTION IN TRANSPARENT POLYMERS: APPLICATION OF WAVEFRONT DISTORTION MEASUREMENTS TO CHEMICAL SENSORS**

Donald Snyder
Eastern Michigan University, United States

C2P-N2**ROGOWSKI COIL SENSOR AND INTEGRATOR: OPERATION AND DEPENDENCE ON VARIOUS PHYSICAL PARAMETERS**

Arash Hajjam, Sam Seyfi, C. Scott Brown, George Langer, Mitch Morse
Magnelab Inc, United States

C2P-N3**FREQUENCY DOMAIN MEASUREMENTS FOR VIBRATIONAL NOISE REMOVAL**

William Wilson¹, Gary Atkinson²
¹NASA Langley Research Center, United States; ²Virginia Commonwealth University, United States

C2P-N4**DEVELOPMENT OF A HIGH SPEED AIR-COUPLED DUAL-CHANNEL IMPULSE GROUND PENETRATING RADAR FOR TRANSPORTATION INFRASTRUCTURE SAFETY INSPECTION**

Yu Zhang, Anbu Venkatas, Tian Xia, Dryver Huston
University of Vermont, United States

C2P-N5**IMAGE-BASED SPECTROSCOPY FOR ENVIRONMENTAL MONITORING**

Alpha Mansaray, Rosalind Wynne, Eduard Bachmakov, Carolyn Molina
Villanova University, United States

C2P-N6**WEBCAM AND SMART-PHONE FOR PASSIVE EMISSION COLORIMETRIC SENSORS OF FORMALDEHYDE**

Jietae Lee³, Seungjae Lee², Young Hoon Na³, Sin Kim³, Jiryang Lee¹
¹Corny Tech Inc., Korea, South; ²Johns Hopkins University, United States; ³Kyungpook National University, Korea, South

C2P-N7**AC/DC LINEAR MAGNETIC SCANNER FOR BUILDING INDUSTRY**

Ales Zikmund², Jan Vyhnánek², Michal Janosek¹
¹FEE, CTU in Prague, Czech Republic; ²UCEEB, CTU in Prague, Czech Republic

C2P-N8**FLEXIBLE NEEL EFFECT CURRENT SENSOR**

Eric Vourc'H³, Pierre-Yves Joubert¹, Lionel Cima²
¹IEF CNRS, France; ²Neelogy, France; ³SATIE CNRS, France

C2P-N9**WORK FUNCTION FLUCTUATIONS FOR SENSING BY POLYANILINE FILMS**

Ryan West², Mira Josowicz¹, Jiri Janata¹
¹Georgia Institute of Technology, United States; ²National Institute of Standards and Technology, United States

C2P-N10**DESIGN AND ELECTRO-THERMAL ANALYSIS OF SURFACE MICROMACHINED PERFORATED MEMBRANE HOTPLATE FOR CHEMICAL GAS SENSOR APPLICATIONS**

Amit Kumar, Golla Eranna
CSIR-CEERI, India

C2P-N11**A COMPACT, VERSATILE SIX-PORT RADAR SENSOR FOR INDUSTRIAL AND MEDICAL APPLICATIONS**

Sarah Linz², Gabor Vinci¹, Stefan Lindner², Sebastian Mann², Francesco Barbon², Robert Weigel², Alexander Koelpin²
¹InnoSenT GmbH, Germany; ²University of Erlangen-Nuremberg, Germany

C2P-N12**TRL: RAY TRACING-ASSISTED SENSOR LOCALIZATION FOR UNDERWATER ACOUSTIC SENSOR NETWORKS**

Y Kim, C Kim
GIST, Korea, South

C2P-N13**THICKNESS MEASUREMENT OF HEAVY & LIGHT OIL USING BLUE LIGHTS**

Sangwoo Oh, Moonjin Lee
KIOST, Korea, South

2:00 PM - 3:15 PM

C3L-A: CHEMICAL & GAS SENSORS I

Maryland F

Session Chair: Don L. DeVoe (University of Maryland, USA)

2:00 PM

A NOVEL SMECTITE-POLYMER NANOCOMPOSITE (SPN) MICROSTRIP SENSOR FOR RAPID QUANTITATIVE DETECTION OF AFLATOXINS

He Hu, Jun Zou, Youjun Deng

Texas A&M University, United States

2:15 PM

CONTROLLED DRUG RELEASE IN A MICROFLUIDIC DEVICE WITH DROPLET MERGING AND STORAGE FUNCTIONS

Wen-Chuan Cheng, Yuan He, Long Que

Louisiana Tech University, United States

2:30 PM

SENSITIVE DETECTION OF MELAMINE WITH SILICON NANOWIRE FIELD EFFECT TRANSISTOR BIOSENSOR

Ruhai Tian², Suresh Regonda², Serena Greene¹, Gang Zhi³, Jiahuan Ding¹, Walter Hu²

¹Diagtronix Inc., United States; ²University of Texas at Dallas, United States; ³Global Foundry, United States; ³National Institute of Biological Sciences, China

2:45 PM

DEVELOPMENT OF A LOW COST HEMIN BASED DISSOLVED OXYGEN SENSOR WITH ANTI-BIOFOULING COATING FOR WATER MONITORING

Huan-Hsuan Hsu, P. Ravi Selvaganapathy

McMaster University, Canada

3:00 PM

FREE-STANDING PARYLENE C THIN FILMS AS FLEXIBLE PH SENSING MEMBRANES

Tatiana Trantidou, Mehvesh Tariq, Yu-Chun Chang, Christofer Toumazou, Themistoklis Prodromakis

Imperial College London, United Kingdom

2:00 PM - 3:15 PM

C3L-B: SENSOR APPLICATIONS FOR LIFE AND SOCIETY

Maryland E

Session Chairs: Geoffrey Cranch (Naval Research Laboratory, USA), Tao Li (University of Michigan, USA)

2:00 PM

RANDOM WALK AND LIGHTING CONTROL

Matthew Aldrich, Akash Badshah, Brian Mayton, Nan Zhao, Joseph Paradiso

Massachusetts Institute of Technology, United States

2:15 PM

WIRELESS SENSOR NODE FOR BACKSCATTERING ELECTRICAL SIGNALS GENERATED BY PLANTS

Christos Konstantopoulos, Eleftherios Kampianakis, Eftichios Koutroulis, Aggelos Bletsas
Technical University of Crete, Greece

2:30 PM

COTS-BASED STICK-ON ELECTRICITY METERS FOR BUILDING SUBMETERING

Michael Lorek², Fabien Chraim², Steven Lanzisera¹, Kristofer Pister²
¹*Lawrence Berkeley National Laboratory, United States;* ²*University of California, Berkeley, United States*

2:45 PM

PARETO-OPTIMAL SIGNAL PROCESSING ON LOW-POWER MICROPROCESSORS

Peter Christ, Gregor Sievers, Julian Einhaus, Thorsten Jungeblut, Mario Pormann, Ulrich Rückert
Bielefeld University, Germany

3:00 PM

IMAGE SENSING SYSTEM FOR NAVIGATING VISUALLY IMPAIRED PEOPLE

Thomas Gonnot, Jafar Saniie
Illinois Institute of Technology, United States

2:00 PM - 3:15 PM

C3L-C: PHYSICAL SENSORS II

Maryland A

Session Chairs: Goutam Koley (University of South Carolina, USA), Gaurav Bahl (University of Illinois at Urbana-Champaign, USA)

2:00 PM

FATIGUE CRACK DETECTION OF CFRP COMPOSITE PRESSURE VESSEL USING MECHANOLUMINESCENT SENSOR

Naohiro Ueno³, Chao-Nan Xu^{2,4}, Shogo Watanabe¹
¹*HyTReC, Japan;* ²*National Institute of Advanced Industrial Science and Technology (AIST), Japan;* ³*Saga University, Japan;* ⁴*Kyushu University*

2:15 PM

A PASSIVE, WIRELESS STRAIN SENSOR USING A MICROFABRICATED MAGNETOELASTIC BEAM ELEMENT

Venkatram Pepakayala, Yogesh B. Gianchandani
University of Michigan, United States

2:30 PM

MULTI-POINT BEARING CAGE WIRELESS TEMPERATURE SENSOR

Amir Shahidi, Lokesh Gupta, Dimitrios Peroulis
Purdue University, United States

3:00 PM

FABRICATION OF A SANDWICH TYPE THREE AXIS CAPACITIVE MEMS ACCELEROMETER

Serdar Tez, Tayfun Akin
Middle East Technical University, Turkey

2:00 PM - 3:15 PM

C3L-D: OPTICAL SENSORS ON SILICON

Maryland D

Session Chair: Michael Shur (Rensselaer Polytechnic Institute, USA)

2:00 PM

SILICON PHOTOMULTIPLIER TECHNOLOGY FOR LOW-LIGHT INTENSITY DETECTION

Massimo Mazzillo, Ferenc Nagy, Delfo Sanfilippo, Giusy Valvo, Beatrice Carbone, Angelo Piana, Giorgio Fallica
STMicroelectronics, Italy

2:15 PM

A NEW POSITION-SENSITIVE SILICON PHOTOMULTIPLIER WITH SUBMILLIMETER SPATIAL RESOLUTION FOR PHOTON-CLUSTER IDENTIFICATION

Ilaria Sacco², Peter Fischer², Alberto Gola¹, Claudio Piemonte¹
¹Fondazione Bruno Kessler, Italy; ²Heidelberg University, Germany

2:30 PM

OUTPUT RESPONSE CHARACTERISTICS OF RESONANT-TYPE GUIDED-WAVE OPTICAL ACOUSTIC EMISSION SENSOR

Sotaro Tachibana, Masashi Ohkawa, Takashi Sato
Niigata University, Japan

2:45 PM

OPTICAL SPECTRAL RESPONSE FOR RELATIVE HUMIDITY MEASURED WITH POLYVINYLPYRROLIDONE-COATED MACH-ZEHNDER INTERFEROMETER

Myoung Jin Kim, Eun Joo Jung, Woo Jin Lee, Sung Hwan Hwang, Byung Sup Rho
Korea Photonics Technology Institute, Korea, South

3:00 PM

UV-SENSITIVE LOW DARK-COUNT PUREB SINGLE-PHOTON AVALANCHE DIODE

Lin Qi², K.R.C. Mok², Edoardo Charbon², Lis K. Nanver², Mahdi Aminian¹
¹Ecole Polytechnique Fédérale de Lausanne, Switzerland; ²Delft University of Technology, Netherlands

2:00 PM - 3:15 PM

C3L-E: LATE NEWS I

Watertable ABC

Session Chair: Usha Varshney (National Science Foundation, USA)

2:00 PM

DIRECT DETECTION OF ADENOVIRUS IN ENVIRONMENTAL WASTE WATERS BY PORTABLE OPTICAL FIBER SENSOR PLATFORM

Nimet Yildirim¹, Dan Li², Feng Long², April Gu¹
¹Northeastern University, United States; ²Tsinghua University, China

2:15 PM

LOW-NOISE SMART SENSOR BASED ON SILICON NANOWIRE FOR MEMS RESISTIVE MICROPHONE

Jamel Nebhen², Eric Savary², Wenceslas Rahajandraibe², Christian Dufaza², Stephane Meillère², E. Kussener², Herve Barthélémy², J. Czarny¹, Arnaud Walther¹

¹CEA-LETI, France; ²Aix Marseille University, France

2:30 PM

POLYMER-BASED MICROFLUIDIC DEVICES FOR RARE CELL DETECTION BY ULTRASOUNDS

Itziar Gonzalez¹, Victor Acosta¹, Maria Tijero³, Javier Berganzo³, Adela Castillejo², Jose Luis Soto², Alain Martin⁴, Mounir Bouali⁴

¹CSIC, Spain; ²Hospital General Universitario de Elche, Spain;

³IKERLAN, Spain; ⁴University Politecnica Mondragon, Spain

2:45 PM

A NOVEL INKJET-PRINTED CHIPLESS RFID-BASED PASSIVE FLUID SENSOR PLATFORM

Sangkil Kim², James Cooper², Manos Tentzeris², Robert Herre¹, Sijia Gu³, Tuami Lasri³

¹Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany;

²Georgia Institute of Technology, United States; ³Université Lille 1, France

3:00 PM

PLATINUM FUNCTIONALIZED TITANIA NANOTUBE ARRAY SENSOR FOR DETECTION OF TRICHLOROETHYLENE IN WATER

Harikrishnan Jayamohan, York Smith, Bruce Gale, Manoranjan Misra, Swomitra Mohanty

University of Utah, United States

2:00 PM - 3:15 PM

C3L-F: HARVESTING & CONVERTERS

Homeland

Session Chairs: Christopher Salthouse (University of Massachusetts Amherst, USA), Christian Zorman (Case Western Reserve University, USA)

2:00 PM

A MULTI-ANODE PAPER-BASED MICROBIAL FUEL CELL FOR DISPOSABLE BIOSENSORS

Arwa Fraiwan, Seokheun Choi

Binghamton University, United States

2:15 PM

AN ULTRA-LOW-POWER ACTIVE AC-DC CMOS CONVERTER FOR SUB-1V INTEGRATED ENERGY HARVESTING APPLICATIONS

Abdallahman Sayed Herbawi, Oliver Paul, Tzeno Galchev

University of Freiburg, Germany

2:30 PM

PERFORMANCE METRICS FOR THERMOELECTRIC ENERGY HARVESTING STUDIED USING A NOVEL PLANAR 65 NM SILICON CMOS-BASED THERMOPILE

Hal Edwards, Jeff Debord, Toan Tran, Dave Freeman, Ken Maggio

Texas Instruments, Inc., United States

2:45 PM

SCHEME FOR IMPROVED INTEGRATION AND LIFETIME FOR PIEZOELECTRIC ENERGY HARVESTERS

Alwyn Elliott¹, James Dicken¹, Lindsay Miller², Paul Wright², Paul Mitcheson¹

¹Imperial College London, United Kingdom; ²University of California, Berkeley, United States

3:00 PM

TOWARDS A SELF-SUSTAINED MOISTURE AND TEMPERATURE MONITORING SYSTEM USING SOIL ENERGY

Fu-To Lin¹, Jen-Chien Hsieh¹, Fu-Chun Wen¹, Wei-Kuan Wang¹, Huang-Chen Lee¹, Yu-Te Liao^{1,2}

¹National Chung-Cheng University, Taiwan; ²National Chiao-Tung University

3:45 PM - 5:00 PM

C4L-D: OPTICAL SENSOR SIGNAL ANALYSES

Maryland D

Session Chairs: Paddy French (TU Delft, The Netherlands), Carlos Ruiz-Zamarreno (Universidad Publica de Navarra, Spain)

3:45 PM

MRI-COMPATIBLE OPTICALLY-SENSED CELLO

Avrum Hollinger, Marcelo Wanderley

McGill University, Canada

4:00 PM

SIGNAL PROCESSING FOR ELECTRO-OPTIC VOLTAGE SENSOR

Olivier Steiger¹, Sergio Marchese¹, Joris Pascal¹, Klaus Bohnert¹, Stephan Wildermuth²

¹ABB Switzerland Inc., Switzerland; ²ABB Germany Inc., Germany

4:15 PM

A COMPARISON OF TECHNIQUES FOR EXTRACTING TRANSVERSE SPEED FROM PHOTON DOPPLER VELOCIMETRY SIGNAL CONTENT

Erik Moro, Matthew Briggs, Lawrence Hull

Los Alamos National Laboratory, United States

4:30 PM

SILICON NITRIDE BASED MID-INFRARED MICROPHOTONICS FOR SENSOR APPLICATIONS

Pao Lin, Vivek Singh, Lionel Kimerling, Anuradha Agarwal

Massachusetts Institute of Technology, United States

3:45 PM - 5:00 PM

C4L-E: LATE NEWS II

Watertable ABC

Session Chairs: Usha Varshney (National Science Foundation, USA)

3:45 PM

A MIXED APPROACH LOAD BALANCING AND EFFICIENT ENERGY FOR MULTI-PATH ROUTING IN MOBILE AD HOC NETWORKS

Fatiha Djemili, Cherif Tolba

Badji Mokhtar-Annaba University, Algeria

4:00 PM

INDOOR POSITIONING WITH MAXIMUM LIKELIHOOD CLASSIFICATION OF WI-FI SIGNALS

Noah Pritt

Frederick Community College, United States

4:15 PM

MICROCONTROLLER-BASED POWER MANAGEMENT FOR NANOWATT AND MICROWATT ENERGY HARVESTERS

Dusan Vuckovic

DELTA – IdemoLab/Technical University of Denmark, Denmark

4:30 PM

DESIGN AND PERFORMANCE OF A REAL-TIME ACOUSTIC BEAMFORMING SYSTEM

Alaa Abdeen, Laura Ray

Dartmouth College, United States

4:45 PM

OPEN ARCHITECTURE FOR WSN BASED ON RUNTIME RECONFIGURABLE SYSTEMS AND THE IEEE 1451

Jean Guevara¹, Enrique Vargas¹, Fernando Brunetti¹, Federico Barrero²

¹*Universidad Catolica Nuestra Señora de la Asuncion, Paraguay;*

²*Universidad de Sevilla, Spain*

3:45 PM - 5:00 PM

C4L-F: CHARACTERIZATION & TESTING

Homeland

Session Chairs: Babak Ziaie (Purdue University, USA), Christian Zorman (Case Western Reserve University, USA)

3:45 PM

WAVELENGTH DISPERSION OF VERDET CONSTANT IN E-FIELD ORIENTED IRON OXIDE DOPED POLYMER NANOCOMPOSITES

Ganapathy Kumar, Satish Mahajan

Tennessee Technological University, United States

4:00 PM

HETEROGENEOUS INTEGRATION OF AN INAS NANOWIRE WITH ENERGY-EFFICIENT CMOS DELTA-SIGMA MODULATOR

Kenji Michimata, Hiroaki Kotani, Tatsuro Watanabe, Hiroaki Funayama, Shin Murakami, Kazuhiko Shimomura, Takao Waho
Sophia University, Japan

4:15 PM

IMPACT OF GAMMA RADIATION ON RANGE FINDING SENSOR PERFORMANCE

Zachary Diggins, Nagabhushan Mahadevan, Dan Herbison, Eric Barth, Arthur Witulski

Vanderbilt University, United States

4:30 PM

A NEW APPROACH ON MEMS SENSOR BATCH TESTING USING AN ANALOGUE PARALLEL TEST METHODOLOGY FOR MASSIVE REDUCTION OF TEST TIME

Florian Oesterle, Robert Weigel, Alexander Koelpin

University of Erlangen-Nürnberg, Germany

4:45 PM

DEVELOPMENT OF NOVEL POLYMERIC SENSORS FOR TASTE SENSING: ELECTRONIC TONGUE

Basudam Adhikari², Manmatha Mahato², Tridib Sinha², Arnab Halder², Nabarun Bhattacharya¹

¹Centre For Development Of Advanced Computing (C-DAC), India;

²Indian Institute of Technology Kharagpur, India

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