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Dear SENSORS Participant and Member of the SENSORS Community,

On behalf of the Organising Committee of the 10th IEEE SENSORS Conference 2011, it is a great honour and pleasure to welcome you to the University of Limerick (UL) located on the outskirts of the historic City of Limerick as well as the beautiful surrounding Shannon region, Ireland.

This annual International Conference was established (in 2002) and is sponsored by the IEEE SENSORS Council for the presentation, discussion and exchange of information regarding the latest research and developments in the area of SENSORS and related fields. The inaugural conference was held in Orlando (Florida, USA) in May 2002 and has since been held in the Autumn in Toronto (Canada, 2003), Vienna (Austria, 2004), Irvine (California, USA, 2005), Daegu (South Korea, 2006), Atlanta (Georgia, USA, 2007), Lecce (Italy, 2008), Christchurch (New Zealand, 2009) and most recently in Hawaii (Big Island) 2010. Next year’s event will take us to the exotic setting of Taipei, Taiwan.

IEEE SENSORS brings together researchers, developers and practitioners from diverse fields and thus provides a unique opportunity to meet friends and colleagues both old and new. This year we are happy to report that the attendance will be in excess of 600 delegates from 50 different countries representing a balanced mix of participants from the three main regions namely the Americas, Europe, the Middle East and Africa as well as Asia and Oceania. The conference attracted 890 submissions from 50 countries, from which 547 abstracts (299 Oral and 248 Posters), 23 Late News papers and 20 Open Posters were accepted for presentation. We sincerely thank all authors for submitting their latest work, thus contributing to the excellent technical programme of the Conference. In order to accommodate the broad range of topics, the Conference sessions have been organised into six parallel oral sessions which will run between Saturday 29th October through Monday 31st October and will be held entirely on site at the Greenfield campus of University of Limerick. In addition to the oral sessions there are two dedicated poster sessions on Saturday and Sunday of the conference.

The opening plenary talk will be given by Professor Julian D.C. Jones (OBE) of Herriot Watt University, Edinburgh. We are also delighted to have Prof Evgeni Gousev of Qualcomm, USA and Prof Aaron Ho, Electronic Engineering, Chinese Univ. of Hong Kong, China as the Keynote speakers for Sunday and Monday respectively. There will be a welcome reception for all arriving guests at the University on Friday Evening and the Conference Gala dinner will take place on Sunday evening and is located at the highly impressive Thomond Park stadium, Limerick, which is the spiritual home of Munster Rugby (European Champions 2006 and 2008). There are also additional cultural evenings on the Saturday evening which will take place at Bunratty Castle, Knappogue Castle and the Stables Club of UL.

The success of this year’s Conference is largely due to volunteer commitment from all members of the Organising Committee. The regional technical programme chairs, Anna Mignani, Perry Shum Ping and Reza Gohdssi and the 137 members of the Technical Programme Committee must be commended for their rigorous reviews of all submitted abstracts. The Local Organising Committee as coordinated by Thomas Newe have worked tirelessly in securing national support and participation. As Special Sessions Chair, Tong Sun has set up a unique and engaging set of 20 Special Focus Sessions comprising invited speakers who are internationally recognised leaders in their field. The Tutorial Chair, Gerald Farrell has identified and selected a topical set of Tutorial Speakers for Friday 28th October.

This year there has been an unprecedented level of financial support and external promotion for this conference and in these challenging financial times we greatly appreciate the generous support from national organisations (SFI, EI, Failte Ireland) as well as national and international industrial organisations including Silicon Labs Inc, Analog Devices and Intel. This level of support has been augmented by active participation by several exhibitors who will participate in a vibrant exhibition comprising display stands and tables in the main conference area within the Atrium of the University Concert Hall throughout the duration of the conference. Finally, we wish to thank the Conference Management team, Conference Catalysts LLC, under the leadership of Chris Dyer who have been a pleasure to work with in making this conference an all round success.

In summary, we look forward to welcoming you again next year at IEEE SENSORS 2012 in Taipei, Taiwan to be held during October 28-31, 2012.

Elfed Lewis
Conference Chair

Thomas Kenny,
Technical Programme Chair
CONFERENCE AT A GLANCE

**07:00 - 18:00**
CONFERENCE REGISTRATION & CHECK-IN | FOUNDATION BUILDING - ATRIUM

**07:00 - 17:00**
TUTORIAL REGISTRATION & CHECK-IN | FOUNDATION BUILDING - ATRIUM

**09:00 - 18:30**
TUTORIALS - MAIN BUILDING

**19:00 - 21:00**
WINE & CHEESE WELCOME RECEPTION

**07:00 - 16:00**
REGISTRATION | FOUNDATION BUILDING - ATRIUM

**08:00 - 08:25**
OPENING & INTRODUCTIONS | FOUNDATION BUILDING - ATRIUM

**08:25 - 09:10**
KEYNOTE PRESENTATION 1 | FOUNDATION BUILDING - CONCERT HALL
Professor Julian Jones, OBE FRSE FOSA

**09:30 - 11:00**
CONCERT HALL
JEAN MONET | JOHN HOLLAND | CHARLES PARSONS | FB028 | FG042

**09:30 - 11:00**
A1L-A | A1L-B | A1L-C | A1L-D | A1L-E | A1L-F
GAS SENSORS I | DYNAMIC SYSTEMS | SPECIAL SESSION: THZ SENSING: MATERIALS, DEVICES & SYSTEMS I | SPECIAL SESSION: SENSOR & NETWORK DESIGN | STRESS SENSORS | FIBER-BASED PHYSICAL SENSORS

**11:00 - 11:30**
BREAK | FOUNDATION BUILDING - ATRIUM

**11:30 - 13:00**
A2L-A | A2L-B | A2L-C | A2L-D | A2L-E | A2L-F
GAS SENSORS II | INERTIAL SENSORS | SPECIAL SESSION: THZ SENSING: MATERIALS, DEVICES & SYSTEMS II | SPECIAL SESSION: FROM SENSOR TO WEB | STRAIN-BASED SENSORS | FIBER-BASED CHEMICAL SENSORS

**13:00 - 14:00**
LUNCH | MAIN BUILDING - EDEN, RED RAISON RESTAURANT

**14:15 - 16:00**
POSTER SESSION #1 | EGO 10

**16:00 - 17:30**
A4L-A | B1L-A | B1L-B | B1L-C | B1L-D | A4L-E | B1L-F
CHEMICAL SENSORS | SPECIAL SESSION: NANO TECHNOLOGY AND BIOSENSING | MECHANICAL PARTICLE SENSORS | INTEGRATED SENSOR INTERFACES | SPECIAL SESSION: TOWARDS AUTONOMY IN NETWORKS... | FLEXIBLE SENSORS | SPECIAL SESSION: BIOMETRICS: LEARNING FROM NATURE

**19:45 - 22:15**
OPTIONAL ENTERTAINMENT & DINNER

**07:00 - 16:00**
REGISTRATION 2 | FOUNDATION BUILDING - ATRIUM

**08:00 - 08:45**
KEYNOTE PRESENTATION 2 | FOUNDATION BUILDING - CONCERT HALL
Evgeni Goussev, Qualcomm, USA.

**09:00 - 10:30**
B1L-A | B1L-B | B1L-C | B1L-D | B1L-E | B1L-F
SPECIAL SESSION: ULTRASOUND MOLECULAR IMAGING AND NANOSYSTEMS | NANOTECHNOLOGY AND BIOSENSING | INTEGRATED SENSOR INTERFACES | SPECIAL SESSION: TOWARDS AUTONOMY IN NETWORKS... | BIOCHEMICAL SENSORS & SYSTEMS | SPECIAL SESSION: SENSOR RELIABILITY

**10:30 - 11:00**
BREAK | FOUNDATION BUILDING - ATRIUM

**11:00 - 12:30**
ULTRASOUND MOLECULAR IMAGING AND NANOSYSTEMS | THERMAL MICROSYSTEMS | INFORMATION PROCESSING | SENSORS & WORKSHOP TECHNOLOGIES I | BIOCHEMICAL SENSORS TECHNOLOGIES | SPECIAL SESSION: OPTICAL METROLOGY FOR STRUCTURAL HEALTH MONITORING

**12:30 - 13:30**
LUNCH | MAIN BUILDING - EDEN, RED RAISON RESTAURANT

**13:30 - 15:15**
POSTER SESSION #2 | EGO 10

**15:15 - 16:45**
B4L-A | B4L-B | B4L-C | B4L-D | B4L-E | B4L-F
NANOMATERIALS FOR SENSORS | THERMAL SENSORS | MACROSCOPIC SENSORS APPLICATIONS | WIRELESS INTERFACES | BIOSENSORS I | SPECIAL SESSION: OPTICAL METROLOGY FOR STRUCTURAL HEALTH MONITORING

**19:00 - 22:00**
BANQUET | THOMAND PARK

**07:00 - 16:00**
REGISTRATION | FOUNDATION BUILDING - ATRIUM

**08:00 - 08:45**
KEYNOTE PRESENTATION 3 | FOUNDATION BUILDING - CONCERT HALL
"Plasmonic Sensing Techniques" Prof Aaron Ho, Electronic Engineering, Chinese Univ. of Hong Kong, China.

**09:00 - 10:30**
C1L-A | C1L-B | C1L-C | C1L-D | C1L-E | C1L-F
NANOSENSORS | SPECIAL SESSION: SELF-MIXING LASER SENSORS | FLUIDS AND FLOW | SPECIAL SESSION: INTELLIGENT WEARABLE WIRELESS INERTIAL MEASUREMENT | MULTI-AXIS SENSORS | OPTICAL SENSORS & SYSTEMS I

**10:30 - 11:00**
BREAK | FOUNDATION BUILDING - ATRIUM

**11:00 - 12:30**
C2L-A | C2L-B | C2L-C | C2L-D | C2L-E | C2L-F
BIO MEDICAL MONITORS | INTEGRATED SENSORS | FLUID PROPERTY SENSORS | SPECIAL SESSION: SENSORS TECHNOLOGIES | SPECIAL SESSION: ORGANIC BIOSENSORS | OPTICAL SENSORS & SYSTEMS II

**12:30 - 13:30**
LUNCH | MAIN BUILDING - EDEN, RED RAISON RESTAURANT

**14:00 - 15:15**
POSTER SESSION #3 | EGO 10

**15:45 - 17:15**
C4L-A | C4L-B | C4L-C | C4L-D | C4L-E | C4L-F
LATE NEWS BIO/CHM SENSORS & SYSTEMS | IMAGE SENSORS | CAPACITIVE SENSING TECHNOLOGIES | SENSOR NETWORK TECHNOLOGIES II | ELECTROMAGNETIC SENSORS | OPTICAL SENSORS & SYSTEMS III

**17:15**
CONFERENCE ADJOURNS
Registration & Information Desk
The Registration and Information Desk will be open during the following times:

- Friday, October 28 07:00 - 20:00
- Saturday, October 29 07:00 - 16:15
- Sunday, October 30 07:30 - 17:00
- Monday, October 31 07:30 - 17:00

Meeting Room Locations
Concurrent Sessions A  Concert Hall – FOUNDATION BUILDING
Concurrent Sessions B  Jean Monet – MAIN BUILDING
Concurrent Sessions C  John Holland – MAIN BUILDING
Concurrent Sessions D  Charles Parsons – MAIN BUILDING
Concurrent Sessions E  FB028 – FOUNDATION BUILDING
Concurrent Sessions F  FG042 – FOUNDATION BUILDING
Poster Sessions  EGO 10 – FOUNDATION BUILDING
Exhibitors  Atrium – MAIN BUILDING

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 is included in your bag. 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 IEEE Member
Additional Electronic Proceedings  $100 IEEE Non-Member

Message and Job Market Board
The Message and Job Market Board will be located near the Conference Registration Desk.

Conference Attire
Attire during the duration of the Conference is business casual.

Currency Exchange
EUROs and US dollars are acceptable at regular stores and restaurants. The exchange rate fluctuates daily. For current exchange rates, please visit: www.exchangerate.com.

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
10% is standard for meals. For skycaps, doormen, porters and bellman, $1.00 USD/EURO per bag is standard and $1.00 USD/EURO per night for housekeeping.

Smoking
All meeting rooms and seated functions are smoke free. Please adhere to the smoking policy of the University of Limerick.

Cellular Phones
As a courtesy to our speakers and other attendees, please turn off any cellular phones during sessions.
Friday, October 28th

Event: Tutorial Lunch  
Time: 12:45 p.m. – 1:45 p.m.  
Location: Eden Restaurant (University of Limerick)

Event: Welcome Reception (Wine and Hot Buffet)  
Time: 6:30 p.m. – 8:30 p.m.  
Location: Atrium (University of Limerick)

An Informal Wine and Cheese Welcome Reception will be held in conjunction with registration from 19:00 - 21:30.

Saturday, October 29th

Event: Conference Lunch  
Time: 12:45 p.m. – 1:45 p.m.  
Location: Eden, Red Raison Restaurant (University of Limerick)

Optional Event: Knappogue Castle Banquet  
Time: 7:45 p.m. – 10:45 p.m.  
Location: Knappogue Castle  
*Transportation will be provided to those who registered

Optional Event: Bunratty Castle Banquet  
Time: 7:45 p.m. – 10:45 p.m.  
Location: Bunratty Castle  
*Transportation will be provided to those who registered

Optional Event: “Evening at the Stables”  
Time: 6:00 p.m. – 9:00 p.m.  
Location: The Stables Club – on UL Campus  
*Transportation will be provided back to hotels to those who registered

Sunday, October 30th

Event: Conference Lunch  
Time: 12:30 p.m. – 1:30 p.m.  
Location: Eden, Red Raison Restaurant (University of Limerick)

Event: Conference Banquet – 6:30 p.m. – 9:30 p.m.  
Time: 12:45 p.m. – 1:45 p.m.  
Location: Thomond Park Rugby Stadium  
*Transportation will be provided

Join us for the conference banquet dinner on Sunday, October 30, 19:00 - 22:00. The Student Paper and Best Poster Awards will be announced. The banquet will be held at the Thomond Park Rugby Stadium. Enjoy traditional Irish song and dance as you overlook the beautiful Rugby pitch. A limited number of optional stadium tours are available prior to the dinner.

Your paid registration fee includes one banquet ticket. Guest tickets can be purchased for $85.00 each at the Conference Registration Desk.

Monday, October 31st

Event: Conference Lunch  
Time: 12:30 p.m. – 1:30 p.m.  
Location: Eden, Red Raison Restaurant (University of Limerick)

**Lunch will be provided to all registrants.**
General Chair
Prof. Elfed Lewis, University of Limerick, IRELAND

Vice Co-Chairs
Prof. Gary K. Fedder, Carnegie Mellon University, USA
John Vig, Chair for 2012

Technical Program Chair
Prof. Thomas Kenny, Stanford University, USA

Technical Program Chair - America
Prof. Reza Ghodssi, University of Maryland, USA

Technical Program Chair - Asia/Oceania
Prof. Perry Ping Shum, NTU, SINGAPORE

Technical Program Chair - Europe/Africa
Prof. Anna Mignani, CNR Firenze, ITALY

Tutorial Chair
Prof. Gerald Farrell, DIT, IRELAND

Special Sessions Chair
Prof. Tong Sun, London City University, UK

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Alliance Management Group LLC/ePapers.org, USA
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Thomas Freud Wiener, Forté Consultancy, USA

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Micheal C. Wicks, Air Force Research Laboratory, USA

Antennas and Propagation Society
Amir Zaghoul, Virginia Tech, USA

Broadcast Technology
Vacant

Circuit and Systems
Vacant

Communications
Vacant

Computer
Kathy Land, Missile Defense Agency, USA

Dielectrics and Electrical Insulation
Greg Stone, IRRS Power, CANADA

Electromagnetic Compatibility
Vacant

Electron Devices
Amit Lal, University of Ithaca, USA

Engineering in Medicine and Biology
Walt Besio, University of Rhode Island, USA

Industrial Electronics
Vacant

Industry Applications
Robert D. Lorenz, University of Wisconsin-Madison, USA

Instrumentation and Measurement
Vacant

Magnetics Society
Vacant

Microwave Theory and Techniques
Reynold S. Kagiwada, Northrup Grumman, USA

Nuclear and Plasma Sciences
Vacant

Oceanic Engineering
Thomas F. Wiener, Forté Consultancy, USA

Photonics Society
Krikor B. Ozanyan, University of Manchester, UK

Power Engineering
Arun G. Phadke, Virginia Tech, USA

Robotics and Automation
Hajime Asama, University of Tokyo, JAPAN

Signal Processing
Vacant

Solid State Circuits
Vacant

Ultrasonics, Ferroelectrics, and Frequency Control
Vacant

Vehicular Technology
Vacant

Conference Chairs

2012 Taipei, Taiwan
John Vig, Consultant, USA

2011 Limerick, Ireland
Elfed Lewis, University of Limerick, IRELAND

Council Support

IEEE Photonics Society Publications Manager
Linda C. Matarazzo

Webmaster
Anil K. Roy

Email List
Dominic Matern
Exhibits are located in the Atrium. Please refer to the floorplan on page 14.

Set-up: Friday, October 28........13:00 - 15:30

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CST develops and markets high performance software for the simulation of electromagnetic fields in all frequency bands. CST’s success is based on the implementation of unique, leading edge technology in a user-friendly interface. Its customers operate in industries as diverse as Telecommunications, Defense, Automotive, Electronics and Medical Equipment. Classical low frequency applications comprise motors and generators, switches and valves, sensors and actuators. Here, not only the electromagnetic fields, but also force, torque and temperature are relevant. CST products allow you to design, optimize and characterize low frequency devices and components helping to save substantial costs, reduce design risk, and improve overall performance and profitability.

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.

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.org/sensors.

Failte Ireland provides strategic and practical support to develop and sustain Ireland as a high-quality and competitive tourist destination. We work with the tourism industry in areas including business support, enterprise development, training and education, research, marketing and regional development.

The MCCI vision is to increase export revenue and employment of microelectronics companies located in Ireland. MCCI will enable this vision by carrying out world-class industry-relevant circuit research developing a pool of IP and Skills relevant to these companies, thus giving them a competitive advantage.

MIDAS Ireland (Microelectronic Industry Design Association) is a joint Industry and Academic organisation that defines and develops the future direction of Research and Development for the Micro/Nano Electronics Industry in Ireland. It has active participation from Irish based Multi-Nationals and Indigenous Companies as well as the Universities active in research and the education of graduates for the industry. It works closely with State bodies to ensure the infrastructure and supports are in place to enable the sector to grow through new start-ups, more multi-nationals locating in Ireland and existing companies expanding, ultimately benefiting the Irish economy through increased jobs and exports.
Oz Optics

OZ Optics Limited is the leading company in developing fiber optic sensors. 2009 Frost & Sullivan Award Winning sensor generates and measures stimulated brillouin scattering in optical fibers to provide high-resolution simultaneous measurements of both strain and temperature along the entire length of the fiber. By wrapping or embedding a standard telecom singlemode fiber inside a structure such as an oil pipeline, power lines or dam, users can detect when and where the structure is being strained or heated and correct the problem before failure occurs. It is ideal for monitoring large structures including oil & gas pipelines, bridges, power lines, dams, and security fences. The sensor could also be used in detecting fire and corrosion/erosion.

Science Foundation Ireland

Science Foundation Ireland (SFI) invests in academic researchers and research teams who are most likely to generate new knowledge, leading edge technologies and competitive enterprises in the fields of science and engineering underpinning three broad areas:

* Biotechnology
* Information and communications technology
* Sustainable energy and energy-efficient technologies

SFI makes grants based upon the merit review of distinguished scientists.

SFI also advances co-operative efforts among education, government, and industry that support its fields of emphasis and promotes Ireland’s ensuing achievements around the world.

Shimmer Research

Used in over 50 countries, Shimmer is an extremely extensible platform that enables researchers to be at the leading edge of sensing technology. Shimmer is a small wireless sensor platform that can record and transmit physiological and kinematic data in real-time. Designed as a wearable sensor, Shimmer incorporates wireless ECG, EMG, GSR, Accelerometer, Gyro, PIR, Tilt and Vibration sensors.

Silicon Laboratories

Silicon Laboratories (NASDAQ: SLAB) is an industry leader in the innovation of high-performance, analog-intensive, mixed-signal ICs. Mixed-signal ICs enable the analog world we live in to interact with the digital world of computing in customer products like set-top boxes, televisions, and cell phones. Developed by a world-class engineering team, Silicon Labs’ diverse portfolio of highly-integrated, easy-to-use solutions are designed in CMOS, the most widely available process technology, enabling significant integration advantages without sacrificing performance.

Headquartered in Austin, TX, Silicon Labs is a global enterprise with operations, sales and design activities worldwide. Founded in 1996 on the principles of constant innovation and solid execution, Silicon Labs’ strong business fundamentals and proven track record have resulted in sustained growth throughout the company’s history.

Wiley-Blackwell

Wiley-Blackwell are a leading international publisher of print and electronic products, specialising in scientific and technical books and journals. Visit our stand at SENSOR to view our new and bestselling books in the area. All books on display are available at a special conference discount. Alternatively you can find out about all of our publications online: www.wiley.com
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 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 before the session 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 = Saturday  B = Sunday  C = Monday

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.

Saturday Session A3P
G= SPECIAL SESSION: Sensor Technologies for Environmental Monitoring of Clean and Secure Water Supplies
H= SPECIAL SESSION: Intelligent Wearable Wireless Inertial Measurement II
J= SPECIAL SESSION: Ultrasound Molecular Imaging and Nanosystems II
K= Biosensors II
L= Optical Sensors
M= Mechanical & Physical Sensors

Sunday Session B3P
G= SPECIAL SESSION: Biomimetics: Learning from Nature II
H= SPECIAL SESSION: Nanotechnology and Biosensing II
J= SPECIAL SESSION: Towards Autonomy in Sensor Networks
K= Chemical & Gas Sensors
L= Sensor/Actuator Systems
M= Sensor Networks
N= Open Posters

Monday Session C3P
G= SPECIAL SESSION: From Sensor to Web II
H= SPECIAL SESSION: Acoustic Sensors for Extreme Environments II
J= SPECIAL SESSION: Self-mixing Laser Sensors II
K= SPECIAL SESSION: Self-mixing Laser Sensors II
L= Phenomena, Modeling & Evaluation
M= Applications
1 - Silicon Labs
2 - Science Foundation of Ireland
3 - MCCI/MIDAS
3a - IEEE SENSORS 2012
5 - Shimmer Research
6 - Failte Ireland
7 - OzOptics Limited
9 - Wiley
10 - CST
11 - IEEE SENSORS Council
12 - IEEE Gold
POSTER SESSIONS:

Biosensors II: A3P-K1 through A3P-K17

Optical Sensors: A3P-L1 through A3P-L32

Mechanical & Physical Sensors: A3P-M1 through A3P-M35

SPECIAL SESSIONS:

Sensor Technologies for Environmental Monitoring of Clean and Secure Water Supplies: A3P-G1

Intelligent Wearable Wireless Inertial Measurement II: A3P-H1 through A3P-H2

Ultrasound Molecular Imaging and Nanosystems II: A3P-J1
EGO 10
Main Building
IEEE SENSORS 2011

POSTER SESSIONS:
Chemical & Gas Sensors:
B3P-K1 through B3P-K30

Sensor/Actuator Systems:
B3P-L1 through B3P-L17

Sensor Networks:
B3P-M1 through B3P-M10

OPEN POSTERS:
B3P-N1 through B3P-N20

SPECIAL SESSIONS:
Biomimetics: Learning from Nature II:
B3P-G1 through B3P-G7

Nanotechnology and Biosensing II:
B3P-H1 through B3P-H4

Towards Autonomy in Sensor Networks:
B3P-J1 through B3P-J2
POSTER SESSIONS:

Phenomena, Modeling & Evaluation:
C3P-L1 through C3P-L36

Applications:
C3P-M1 through C3P-M51

SPECIAL SESSIONS:

From Sensor to Web II:
P-G1 through C3P-G5

Acoustic Sensors for Extreme Environments II:
C3P-H1 through C3P-H2

Self-mixing Laser Sensors II:
C3P-J1

Ambient Intelligence Technologies and Applications:
C3P-K1
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<th>TIME</th>
<th>JOHN HOLLAND SENSOR SYSTEMS</th>
<th>CHARLES PARSONS STRAND-2: SENSOR APPLICATIONS</th>
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| 9:00 - 10:30| **1a** ROV LATIS – A next generation smart underwater robot: Motivation, challenges, sensor integration, problems and solutions.  
**Presenter:** Edin Omerdic, University of Limerick | **2a** Optical Sensors for Distance and Displacement Measurement  
**Presenter:** Garry Berkovic, Soreq NRC, Israel |
| 10:30 - 10:45| **BREAK**                                                                                   |                                                                                                         |
| 10:45 - 12:15| **1b** Radio Frequency ID Workshop  
**Presenter:** Joe Dowling, Georgia Tech. | **2b** Smart composite structures with embedded fiber optic sensors  
**Presenter:** Ginu Rajan, Photonics Research Centre, DIT |
| 12:15 - 13:30| **LUNCH**                                                                                   |                                                                                                         |
| 13:30 - 15:00| **1c** Instrumentation Amplifiers: Basics and Recent Developments  
**Presenter:** Michiel Pertijs, Delft University of Technology | **2c** Polymer Optical Fibres in Sensing - Applications & Future Demands.  
**Presenter:** Katerina Krebber, BAM Federal Institute for Materials Research and Testing, Berlin |
| 15:00 - 15:15| **BREAK**                                                                                   |                                                                                                         |
| 15:15 - 16:45| **1d** IC-sensor design for non-IC engineers  
**Presenter:** Tim Cummins, Silicon Labs, Limerick | **2d** MEMs Devices in Healthcare  
**Presenter:** Tom O’Dwyer, Analog Devices, Limerick |
| 16:45 - 17:00| **BREAK**                                                                                   |                                                                                                         |
| 17:00 - 18:30| **1e** Emerging Body Worn Sensor Applications to enable new Community and Home Based Risk Assessments and Therapeutic Interventions  
**Presenter:** Michael J. McGrath, Intel Labs |                                                                                                         |
A1L-A1  
OPTICAL SENSOR SYSTEM DETECTING PPM CONCENTRATIONS OF HYDROGEN AND HYDROCARBON GASES AT LOW TEMPERATURE USING GAN/INGAN NANOWIRES  
Sumit Paul1, Andreas Helwig1, Gerhard Müller1, Pascal Becker2, Florian Furtmayer2, Jörg Teubert2, Martin Eickhoff2  
{1}EADS Innovation Works, Germany; {2}Justus-Liebig-Universität Gießen, Germany;  

A1L-A2  
ULTRA-SENSITIVE HYDROGEN GAS SENSING USING DNA-TEMPLATED PALLADIUM NANOWIRES  
Mariam Al Hinai, Nicholas Wright, Alton Horsfall, Reda Hassanien, Benjamin Horrocks, Andrew Houlton  
Newcastle University, United Kingdom  

A1L-A3  
HYDROGEN SENSOR BASED ON MWNTS/WO3  
Azam Izadi2, Rogheyeh Ghasempour1  
{1}Sharif University of Technology, Iran; {2}Sharif University of Technology, Iran  

A1L-A4  
HYDROGEN GAS SENSORS BASED ON THERMALY EVAPORATED NANOSTRUCTURED MOO3 SCHOTTKY DIODE: A COMPARATIVE STUDY  
Mahnaz Shafiei1, Jerry Yu1, Michael Breedon1, Nunzio Motta1, Qinao Wu2, Zheng Hu2, Liu Qian1, Kourosh Kalantar-Zadeh2, Wojtek Wiódarski1  
{1}Kyushu University, Japan; {2}Nanyang University, China;  

A1L-A5  
HYDROGEN DETECTION USING THERMALLY ACTUATED MEMS RESONATORS  
Babak Tousifar, Amir Rahafrooz, Siavash Pourkamali  
University of Denver, United States  

A1L-B1  
PRECISION MODE MATCHING OF MEMS GYROSCOPE BY FEEDBACK CONTROL  
Zhongxu Hu1, Barry Gallagher1, James Burdess2, C.P. Fell1, K. Townsend1  
{1}Atlantic Inertial Systems LTD, United Kingdom; {2}University of Newcastle upon Tyne, United Kingdom  

A1L-B2  
ELECTROSTATIC REGULATION OF QUALITY FACTOR IN NON-IDEAL TUNING FORK MEMS  
Alexander Trusov, Sergei Zotov, Andrei Shkel  
University of California, Irvine, United States  

A1L-B3  
DEVELOPMENT OF KINETIC ENERGY HARVESTING SYSTEMS FOR VEHICLE APPLICATIONS  
Alan Phipps1, Dung Phung1, Maxwell Kerber1, Brian Dick1, Alicia Powers1, Richard Waters2  
{1}Space and Naval Warfare Systems Center - Pacific, United States; {2}SSEC Pacific, United States  

A1L-B4  
IMPROVED PIEZOELECTRIC MULTIFREQUENCY ENERGY HARVESTING BY MAGNETIC COUPLING  
Jin Yang, Yumei Wen, Ping Li, Xiaoling Bai, Ming Li  
Chongqing University, China  

A1L-B5  
AN ENERGY HARVESTING SYSTEM WITH A NOVEL RECTIFIER CHARGE PUMP  
Tzu-Chia Huang, Fu-Ming Hsu, Paul C.-P. Chao  
National Chiao Tung University, Taiwan  

A1L-C1  
INVITED: TERAHERTZ ELECTRONICS FOR SENSING APPLICATIONS  
Michael Shur  
Rensselaer Polytechnic Institute, United States  

A1L-C2  
NEW SEMICONDUCTOR MATERIALS AND DEVICES FOR TERAHERTZ IMAGING AND SENSING  
Taichi Otsuji1, Tananobu2, K. Akagawa2, Y. Tanimoto2, S. Boubanga Tombet2, T. Suemitsu2, S. Chani3, Dominique Coquillat3, W. Knap4, V. Ryzhii4  
{1}Nano-Japan Rice University, Tohoku University, University of Pennsylvania, United States; {2}Tohoku University, Japan; {3}Université Montpellier 2, France; {4}University of Aizu, Japan  

A1L-C4  
A VERSATILE MILLIMETRE WAVE SCANNER FOR GOODS INSPECTION  
Christian Wagner, Helmut Essen, Alexander Hommes, Dirk Nübler, Paul Warok, Sven Heinen  
Fraunhofer Institute for High Frequency Physics and Radar Techniques, Germany  

A1L-C5  
TERAHERTZ SENSING AND IMAGING USING A QUANTUM CASCADE LASER  
Paul Dean1, Alex Valavanis2, Suraj P. Khanna3, Mohammad Lachhab1, Dragan Indjin2, Zoran Ikonic2, Paul Harrison3, Edmund Linfield3, A. Giles Davies2, Y. Tsao Loo3, Russell Kliese3, Milan Nikolic3, Stephen J. Wilson2, Aleksander Rakic2  
{1}University of Leeds, United Kingdom; {2}University of Queensland, Australia; {3}University of New South Wales, Australia
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<th>SESSION A2L-B: INERTIAL SENSORS (CONT’D)</th>
<th>SPECIAL SESSION A1L-C: THz SENSING: MATERIALS, DEVICES &amp; SYSTEMS II (CONT’D)</th>
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<tr>
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<td>JEAN MONET</td>
<td>JOHN HOLLAND</td>
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<td>SILICON CMOS-BASED THz DETECTION</td>
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<td>Aldo Romani1, Enrico Sangiorgi2, Marco Tartagni2, Rudi Paolo Paganelli1</td>
<td>Alyudas Lisaukas, Sebastian Boppel, Viktor Krozer, Hartmut Roskos</td>
</tr>
<tr>
<td>(1)National Research Council, IEIIT, Italy; (2)Università di Bologna, Italy</td>
<td>Goethe-University, Germany</td>
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BREAK | 11:00- 11:30 | FOUNDATION BUILDING - ATRIUM
SPECIAL SESSION A1L-D: SENSOR & NETWORK DESIGN
Chairs:
Elena Gaura, Coventry University
Youn-Tae Kim, Chosun University

SESSION A1L-E: STRESS SENSORS
Chairs:
Luc Hebrard, IMESS Strasbourg
Walter Lang, Universität Bremen

SESSION A1L-F: FIBER-BASED PHYSICAL SENSORS
Chairs:
Wolfgang Habel, BAM - Berlin
Rosalind Wynne, Villanueva University

CHARLES PARSONS

A1L-D1
INVITED: CHALLENGES AND RESULTS IN CITY-SCALE SENSING
Lisa Amini, Eric Bouillet, Francesco Calabrese, Luca Gasparini, Olivier Verscheure
IBM Research, Ireland

A1L-D3
BARE NECESSITIES-KNOWLEDGE-DRIVEN WSN DESIGN
Elena Gaura, James Brusey, Ross Wilkins
Coventry University, United Kingdom

A1L-E1
MICROFABRICATED SILICON-ON-PIREX PASSIVE WIRELESS WALL SHEAR STRESS SENSOR
Jeremy Sells, Vijay Chandrasekharan, Jessica Meloey, Mark Sheplak, Henry Zmuda, David Arnold
University of Florida, United States

A1L-E2
SOFT ARTIFICIAL SKIN WITH MULTIMODAL SENSING CAPABILITY USING EMBEDDED LIQUID CONDUCTORS
Yong-Lae Park, Bor-Rong Chen, Robert J. Wood
Harvard University, United States

A1L-E3
ON THE INFLUENCE OF THERMAL TREATMENT ON STRAIN SENSORS BASED ON THE FERROMAGNETIC SHAPE MEMORY ALLOY NIMGA
Jochen Matthias Stephan, Kyle Retan, Patrick Ruther, Oliver Paul
IMTEK, University of Freiburg, Germany

A1L-E4
A NOVEL IN VIVO SENSOR FOR LOOSENING DIAGNOSTICS IN TOTAL HIP REPLACEMENT
Hartmut Ewald, Catherine Ruther, Wolfram Mittelmeier, Rainer Bader, Daniel Kluess
Universität Rostock, Germany

A1L-E5
CMOS-BASED PIEZO-FET STRESS SENSORS IN WHEATSTONE BRIDGE CONFIGURATION
Pascal Gieschke, Bjorn Sbiesski, Oliver Paul
IMTEK, University of Freiburg, Germany

A1L-E6
OPTIMALLY INTERROGATED, MICROFABRICATED WALL SHEAR STRESS SENSOR
Daniel Sullivan, John Kline, Maria Salamon, Sohail Zaidi, Richard Miles
(1)Princeton University, United States; (2)Research Support Instruments, United States

A1L-E7
HIGH-SENSITIVITY MICROFLUIDIC PRESSURE SENSOR USING A MEMBRANE-EMBEDDED RESONANT OPTICAL GRATING
Steven Poliand, Ke Liu, Duncan Macfarlane, Jeong-Bong Lee
University of Texas at Dallas, United States

A1L-E8
SOFT ARTIFICIAL SKIN WITH MULTI-MODAL SENSING CAPABILITY USING EMBEDDED LIQUID CONDUCTORS
Yong-Lae Park, Bor-Rong Chen, Robert J. Wood
Harvard University, United States

A1L-F1
TEMPERATURE COMPENSATED MINIATURE ALL-GLASS FIBRE OPTIC PRESSURE SENSOR
Kurt Bremer, Elfed Lewis, Gabriel Leen, Brian Moss, Steffen Lochmann, Ingo Mueller
(1)Hochschule Wismar, Germany; (2)University of Limerick, Ireland

A1L-F3
TOWARDS MICRO-STRUCTURED OPTICAL FIBER SENSORS FOR TRANSVERSE STRAIN SENSING IN SMART COMPOSITE MATERIALS
Sanne Sulejmani, Camille Sonnenfeld, Thomas Geernaert, Francis Berghmans, Hugo Thienpont, Sophie Eve, Nicolas Lammens, Geert Luyckx, Eli Voet, Joris Degnecker, Wacław Urbanczyk, Pawel Mergo, Martin Becker, Hartmut Bartelt
(1)GRISMAT CNRT/Mat’elvax/ENSICAEN, France; (2)Institute of Photonic Technology, Germany; (3)Marie Curie-Sklodowska University, Poland; (4)Université de Genève, Belgium; (5)Vrije University Brussel, Belgium; (6)Wroclaw University of Technology, Poland

A1L-F4
150-KM LONG DISTANCE FIBER SENSOR SYSTEM BASED ON RAMAN AMPLIFICATION
Junhao Hu, Changyuan Yu, Zhihao Chen
(1)A*STAR Institute of High Performance Computing, I2R, Singapore; (2)National University of Singapore, Singapore

A1L-F5
REFLECTOMETRIC FIBER OPTIC SENSOR FOR DISTRIBUTED MEASUREMENT OF INTENSE MAGNETO-STATIC FIELDS
Luca Palmieri, Andrea Galtarossa
Università degli Studi di Padova, Italy

BREAK | 11:00- 11:30 | FOUNDATION BUILDING - ATRIUM
SESSION A2L-A: GAS SENSORS II

Chair(s):
Mona Zaghloul, George Washington University
Marco Petrovich, University of Southampton

A2L-A1 ELECTRONIC NOSE BASED ON GRAPHENE, NANOTUBE AND NANOWIRE CHEMIRESISTOR ARRAYS ON SILICON
Samuel MacNaughton1, Sameer Sonkusale1, Sumedh Sunwade1, Srikanth Ammu2, Sanjeev Manohar2
(1)Tufts University, United States; (2)University of Massachusetts - Lowell, United States

A2L-A2 HUMIDITY SENSING PROPERTIES OF THE SENSOR BASED ON GRAPHENE OXIDE FILMS WITH DIFFERENT DISPERSION CONCENTRATIONS
Cheng-Long Zhao, Ming Qin, Qing-An Huang
Southeast University, China

A2L-A3 THE INFLUENCE OF GATE BIAS AND STRUCTURE ON THE CO SENSING PERFORMANCE OF SiC BASED FIELD EFFECT SENSORS
Zahfira Darmastuti, Ruth Pearce, Anita Lloyd Spetz, Mike Andersson
Linköping University, Sweden

A2L-A4 HIERARCHICAL STRATEGY FOR QUANTIFICATION OF NOX IN A VARYING BACKGROUND OF TYPICAL EXHAUST GASES
Christian Buri1, Andreas Schütze2, Michael Kraft2, Paolo Gardonio3, Stephen Elliott2, Michele Zilletti2
(1)Linköping University, Sweden; (2)Imperial College London, United Kingdom

A2L-A5 PHYSICAL-BASED CHARACTERIZATION OF LOW FREQUENCY RESPONSES IN METAL-OXIDE GAS SENSORS
Thierry Contaret, Jean-Luc Seguin, Khalifa Aguir
Aix-Marseille Université, IM2NP, CNRS, France

SESSION A2L-B: INERTIAL SENSORS

Chair(s):
Libor Rufor, Tima Lab - Grenoble
Slavash Pourkamali, University of Denver

A2L-B1 IMPROVEMENT OF CMOS-MEMS ACCELEROMETER USING THE SYMMETRIC LAYERS STACKING DESIGN
Ting-Han Yen1, Ming-Han Tsai2, Chun-I Chang2, Yu-Chia Liu2, Sheng-Shian Li2, Rongshun Chen2, Jin-Chern Chiu1, Wei-Leon Fang1
(1)National Chiao Tung University, Taiwan; (2)National Tsing Hua University, Taiwan

A2L-B2 DEMONSTRATION OF A WIDE DYNAMIC RANGE ANGULAR RATE SENSOR BASED ON FREQUENCY MODULATION
Sergei Zolot, Alexander Trusov, Andrei Shkel
University of California, Irvine, United States

A2L-B3 TWO-MASS MEMS VELOCITY SENSOR FEEDBACK CONTROL LOOP DESIGN
Ali Asheghi1, Michael Kraft1, Paolo Gardonio3, Stephen Elliott2, Michele Zilletti2
(1)Università degli Studi di Udine, Italy; (2)University of Southampton, United Kingdom

A2L-B4 A NEW BASEBAND EQUIVALENT MODEL FOR SENSE MODE DYNAMICS AND ITS EFFECTS ON FORCE-FEEDBACK CONTROLLER DESIGN FOR MEMS GYROSCOPES
Burak Eminoglu, Said Alper, Tayfun Akin
Middle East Technical University, Turkey

A2L-B5 RESOLUTION AND START-UP DYNAMICS OF MEMS RESONANT ACCELEROMETERS
Alessandro Tacchio1, Alessandro Caspani1, Giacomo Langfelder1, Antonio Longoni1, Ernesto Lasalmandra1
(1)Politecnico di Milano, Italy; (2)STMicroelectronics, Italy

SESSION A2L-C: THZ SENSING: MATERIALS, DEVICES & SYSTEMS II

Chair(s):
Krikor Ozanyan, The University of Manchester
Martin Kraft, Carinthian Tech Research

A2L-C1 THE USE OF TERAHERTZ SENSORS IN INDUSTRY
Philip Francis Taday
TeraView Limited, United Kingdom

A2L-C2 OPTIMIZATION OF THz ABSORPTION IN THIN FILMS
Dragoslav Grbovic, Fabio Alves, Brian Kearney, Karamitros Apostolos, Gamani Karunasiri
Naval Postgraduate School, United States

A2L-C3 OPTIMIZING MOM DIODE PERFORMANCE VIA THE OXIDATION TECHNIQUE
Linzi Dodd, David Wood, Andrew Gallant
Durham University, United Kingdom

A2L-C4 FREQUENCY METROLOGY OF A CW-THz PHOTOMIXING SOURCE
Francis Hindle, Gael Mouret, Arnaud Cuisset, Robin Bocquet
Université du Littoral Côte d’Opale, France

A2L-C5 ADVANCED MBE LOW TEMPERATURE GROWN MATERIALS FOR CW THz GENERATION AND DETECTION
Mohamed Missous
University of Manchester, United Kingdom

SPECIAL SESSION A2L-D: MEMS FUNDAMENTALS

Chair(s):
Mona Zaghloul, George Washington University
Marco Petrovich, University of Southampton

A2L-D1 ELECTRONIC NOSE BASED ON GRAPHENE, NANOTUBE AND NANOWIRE CHEMIRESISTOR ARRAYS ON SILICON
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Southeast University, China

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Zahfira Darmastuti, Ruth Pearce, Anita Lloyd Spetz, Mike Andersson
Linköping University, Sweden

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Christian Buri1, Andreas Schütze2, Michael Kraft2, Paolo Gardonio3, Stephen Elliott2, Michele Zilletti2
(1)Linköping University, Sweden; (2)Imperial College London, United Kingdom

A2L-D5 PHYSICAL-BASED CHARACTERIZATION OF LOW FREQUENCY RESPONSES IN METAL-OXIDE GAS SENSORS
Thierry Contaret, Jean-Luc Seguin, Khalifa Aguir
Aix-Marseille Université, IM2NP, CNRS, France

LUNCH | 13:00-14:00 | MAIN BUILDING - EDEN, RED RAISON RESTAURANT
A3P-K6

NANOPOROUS ALUMINUM ANODIC OXIDE BASED OPTICAL BIOSENSOR FOR REAL-TIME DETECTION OF TROPTONIN T
Se-Hyuk Yeom1, Byoung-Ho Kang2, Ok-Geun Kim2, Hyoung Yu1, Ok-Geun Kim1, Ma-Eum Han1, Dae-Hyuk Kwon1, Shin-Won Kang2

(1)Kyungil University, Korea, South; (2)Kyungpook National University, Korea, South

A3P-K8

NONCONTACT HUMAN ELECTROPHYSIOLOGICAL MEASUREMENTS USING A NEW DISPLACEMENT CURRENT SENSOR
Lorenzo Faggion1, Abdullhussain Mahdi2

(1)Joint Research Centre of the European Commission, Italy; (2)University of Limerick, Ireland

A3P-K7

SOLID-STATE POTENTIOMETRIC BIOSENSORS FOR PH QUANTIFICATION IN BIOMATERIAL SAMPLES
Manius Ivan, Sjoukje Wiegema, Jorgen Sweisssen, Milian Saelinmink, Arjen Boersma

TNO, Netherlands

A3P-K9

CV CHARACTERISATION OF DNA SENSING IN MICRO-PCR CHIP
Cangran Guo1, Tao Deng1, Zewen Liu1, Jian Qin1

(1)Human University, China; (2)Tsinghua University, China

A3P-K10

A MICROFLUIDIC DEVICE FOR HIGH DENSITY HYDRODYNAMIC CELL TRAPPING, GROWTH AND SUPER-RESOLUTION IMAGING
Laurence Bell, Ashwin Seshia, Ernest Laue, David Lando

University of Cambridge, United Kingdom

A3P-K11

PMMA/Ag45% YY-LINBO3 GUIDED SH-SAW BASED IMMUNOSENSING SYSTEM
Chen-Tung Feng, Chi-Jung Cheng, Massood Zandi Atashbar

Western Michigan University, United States

A3P-K12

NON-LITHOGRAPHICALLY MICROMACHINED CAPACITIVE PRESSURE SENSOR BASED ON STAINLESS STEEL FOR BIOMEDICAL APPLICATIONS
Daniel Brox, Abdolreza Rashidi Mohammadi, Kenichi Takahata

University of British Columbia, Canada

A3P-K13

MAGNETICALLY-ACTUATED BLOOD FILTER FOR A CMOS-BASED NANOWIRE BIOSENSOR
Kwang Hyo Chung, Chang-Geun Ahn, Yo Han Choi, Jong-Heon Yang, Chan Woo Park, Wan-Joong Kim, Chil Seong Ah, Gun Yong Sung

Electronics and Telecommunications Research Institute, Korea, South

A3P-K14

MULTI-PARAMETER ON-LINE CELL HEALTH MONITORING SYSTEM
Eric Moore1, Anna Paschero1, Walter Messina1, Eve McLoughlin1

(1)Tyndall National Institute, Lee Maltings, University College Cork, Ireland; (2)University College Cork, Ireland

A3P-K15

FUNCTIONALISED SILICON MICROCHANNEL IMMUNOSENSOR WITH PORTABLE ELECTRONIC READOUT FOR BACTERIA DETECTION IN BLOOD
Chirasree Roychauhuri1, Ramkrishna Das1, Shubhodip Dey1, Sumantra Das2

(1)Bengal Engineering and Science University, Shibpur, India; (2)Indian Institute of Chemical Biology, India

A3P-K16

A NOVEL FRONT-END FOR IMPEDANCE SPECTROSCOPY
Panagiota Kassanos, Iasonas Triantis, Andreas Demosthenous

University College London, United Kingdom

A3P-K17

SENSITIVITY ENHANCED TECHNIQUE AND ITS APPLICATION ON DETECTION OF TUMOR BIOMARKERS
Xiaoxun Zhou1, Wei Hua Hu1, Chang Ming Li2

(1)A*STAR Institute of High Performance Computing, I2R, Singapore; (2)Nanyang Technological University, Singapore
A3P-L1  LONG PERIOD GRATING IN HOLLOW CORE FIBERS: FABRICATION AND CHARACTERIZATION
Agostino Iadickoz1, Stefania Campopiano2, Antonello Cutolo3, Andrea Cusano4
(1)Università degli Studi di Napoli ‘Federico II’; (2)Earthquake Engineering Research Center, Italy; (3)University of Reading, United Kingdom; (4)University of Naples ‘Parthenope’, Italy

A3P-L2  SAW UV SENSORS USING ZNO NANORODS GROWN ON AlN/Si STRUCTURES
Duy-Thach Phan, Gwiy-Sang Chung
University of Ulsan, Korea, South Korea

A3P-L4  INVESTIGATION OF OPTICAL PROPERTIES OF TISSUE USING AN OPTICAL FIBRE SENSOR
Dennis Warmke1, Elfed Lewis2, Martin Leahy3
(1)King’s College London, United Kingdom; (2)Institute of Analytics and Data Science, University of Cambridge, United Kingdom; (3)Institute for Integrated Sensor Systems, Austrian Academy of Sciences, Austria

A3P-L5  NEW INTERROGATION TECHNIQUE FOR MULTIPLEXING LPG-FIBER LOOP MIRRORS BASED DISPLACEMENT SENSORS USING AN OTDR
Mikel Bravo1, M. López-Amor2, Orlando Frazão3, J. M. Baptista4, J. L. Santos5
(1)INESC Porto, Portugal; (2)INESC Porto & Faculdade de Ciências da Universidade do Porto, Portugal; (3)INESC Porto & Universidade da Madeira, Portugal; (4)University Pública de Navarra, Spain

A3P-L6  ENVELOPE EXTRACTION TECHNIQUE FOR A SELF-MIXING CENTIMETRIC DISPLACEMENT LASER SENSOR
Usman Zabit, Thierry Bosch
Université de Lorraine, CNRS, LAAS, France

A3P-L7  FOREIGN OBJECT IMPACT MONITORING ON WIND TURBINE BLADE USING FBGS
Chow-Shing Shinn1, Bo-Lian Chen1, Shien-Kuei Liao2
(1)National Taiwan University, Taiwan; (2)National Taiwan University of Science and Technology, Taiwan

A3P-L10  PERFORMANCE ANALYSIS AND COMPARISON OF COMPOSITE MATERIALS EMBEDDED WITH DIFFERENT OPTICAL FIBER SENSOR TYPES
Giru Rajan1, Manjusha Ramakrishnan1, Yuliya Semenova1, Gerald Farrell2, Andrzej Domanski3, Anna Boczkowska4, Tomasz Wolinski5
(1)Dublin Institute of Technology, Ireland; (2)Hochschule Wismar, Germany; (3)National University of Ireland, Galway, Ireland; (4)University of Ulsan, Korea, South Korea

A3P-L11  QUASI-DISTRIBUTED MEASUREMENT OF SURROUNDING REFRACTIVE INDEX USING PHOTON-COUNTING TIME DOMAIN REFLECTOMETRY
Damien Kinet, Christophe Caucheteur, Marc Wuilpart, Patrice Mégret
Université de Mons, Belgium

A3P-L12  HIGH DYNAMIC RANGE BACKGROUND LIGHT SUPPRESSION FOR A TOP DISTANCE MEASUREMENT SENSOR IN 180NM CMOS
Milos Davidovic, Michael Hofbauer, Kerstin Schneider-Hornstein, Horst Zimmermann
Vienna University of Technology, Austria

A3P-L13  NOISE CONSIDERATIONS ON HYBRID OPTICAL MEMS DISPLACEMENT SENSORS
Wilfried Hortschitz1, Franz Kohl2, Matthias Sachse3, Michael Stifter4, Thilo Sauter5, Harald Steiner6, Johannes Schalko7, Artur Jachimowicz8, Franz Keplinger9
(1)Austrian Academy of Sciences, Austria; (2)Institute for Integrated Sensor Systems, Austrian Academy of Sciences, Austria; (3)Vienna University of Technology, Austria

A3P-L14  PECVD SIC PHOTONIC CRYSTAL SENSOR
Gregory Pandraud, Yujian Huang, P. M. Sarro, Felipe Bernal Arango
Delft University of Technology, Netherlands

A3P-L15  SIZE EFFECT OF GOLD NANOPARTICLES ON OPTICAL MICROFIBER REFRACTIVE INDEX SENSORS
Ying Cui1, Perry Ping Shum1, Guanghui Wang2, Hong Chang2, Xuan Quyen Dinh1, Meng Jiang2, Georges Humbert3
(1)CIRTA, Nanyang Technological University / CNRS/THALES, Singapore; (2)Nanyang Technological University, Singapore; (3)Xi'an - University of Lomiges/CNRS, France

A3P-L16  FABRICATION OF LONG-PERIOD GRATINGS IN MICRO-STRUCTURE SPECIALTIE FIBER WITH RANDOM HOLES IN CLADDING
Yunqi Liu, Dan Yang, Tingyung Wang
Shanghai University, China

A3P-L17  HIGH PERFORMANCE OPTICAL ANGULAR SENSING AT LOW-COST: A BIO-INSPIRED APPROACH
Raphael Juston1, Stéphane Viollet1, Lubin Kerhuel1, Nicolas Franceschini1
(1)Institute of Movement Sciences, CNRS / University of the Mediterranean, France; (2)Movea, France

A3P-L18  LONG-RANGE BOTDA SENSING USING OPTICAL PULSE CODING AND SINGLE SOURCE BI-DIRECTIONAL DISTRIBUTED RAMAN AMPLIFICATION
Mohammad Taki, Marcelo Soto, Fabrizio Di Pasquale, Gabriele Bolognini
Scuola Superiore Sant‘Anna, Italy

A3P-L19  INTRINSIC FIBER OPTIC ULTRASOUND SENSOR FOR OIL IMMERSED DETECTION OF PARTIAL DISCHARGES
Julio E. Posada-Roman, Jose A. Garcia-Souto, Jesus Rubio-Serrano
Universidad Carlos III de Madrid, Spain

A3P-L20  MULTI-PURPOSE OPTOELECTRONIC INSTRUMENT FOR MONITORING THE ALCOHOLIC FERMENTATION OF WINE
Francisco Jiménez, Javier Vázquez, José Luis Sánchez-Rojas, Nuria Barrañón, Juan Bautista Úbeda
Universidad de Castilla-La Mancha, Spain

A3P-L21  A PRESSURE MAPPING DEVICE WITH BRAGG GRATING SENSORS INSERBED IN BOW-TIE FIBRES
Chunxiao Yan, Eleonora Ferraris, Dominiek Reynaerts
Katholieke Universiteit Leuven, Belgium

A3P-L22  DEVELOPMENT OF GRAPHENE-BASED OPTICAL DETECTORS FOR INFRARED SENSING APPLICATIONS
King Wai Chiu Lai, Ning Xi, Hongzhi Chen, Carmen Kar Man Fung, Liangliang Chen
Michigan State University, United States

A3P-L23  SINGLEMODE HETERO-CORE FIBER BASED REFRACTOMETER DEMODULATED IN A RATIOMETRIC SYSTEM
Qiang Wu, Youqiao Ma, Lin Bo, Pengfei Wang, Yuliya Semenova, Gerald Farrell
Dublin Institute of Technology, Ireland

A3P-L24  PARTICLE CHARACTERIZATION WITH THE TIME-SHIFT-TECHNIQUE
Arno Kretschmer, Stephan Höhne, Nils Damaschke
Universität Rostock, Germany

A3P-L25  PRELIMINARY EVALUATION OF A HIGH PRESSURE, HIGH-TEMPERATURE DOWHOLE OPTICAL SENSOR
Grzegorz Fusiak, Pawel Niewczas, Graeme Burt
University of Strathclyde, United Kingdom
A3P-M6 MEMS RELATIVE PRESSURE SENSOR ON FLEXIBLE SUBSTRATE  
Moinuddin Ahmed, Donald Butler, Zeynep Celik-Butler  
University of Texas at Arlington, United States

A3P-M7 A HOT FILM WIND SENSOR WITH FOUR CONSTANT TEMPERATURE DIFFERENCE ELEMENTS FABRICATED ON CERAMIC SUBSTRATE  
Ziqiang Dong, Jingjing Chen, Yukun Qin, Ming Qin, Qing-An Huang  
Southeast University, China

A3P-M8 SENSITIVITY ENHANCEMENT OF LC SENSORS WITH NOVEL INDUCTOR DESIGN  
Sung-Yueh Wu, Wensyang Hsu  
National Chiao Tung University, Taiwan

A3P-M9 MATCHING OF MAXIMUM GAUGE FACTOR AND TCR ZERO CROSSING OF ME-DLC  
Ulrike Heckmann1, Ralf Bandorf1, Mirjana Petersen2, Virginia Gwzdzi1, Günter Bräuer1  
(1)Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany; (2)Technische Universität Braunschweig, Germany

A3P-M10 LOW DRIFT IN POLYSILICON-OXIDE MICROMACHINED ULTRASONIC TRANSDUCERS  
Christophe Antoine, Sushil Bharatan, Erik Tarvin, Urvi Shah, Michael Judy  
Analog Devices Inc, United States

A3P-M11 EXPERIMENTAL AND ANALYTICAL STUDY ON HYSTERESIS ERROR OF CAPACITIVE LIQUID-LEVEL SENSOR  
Yongjing Peng, Qingsong Chen, Jiangbo Zou  
Beijing Research Institute of Telemetry, China

A3P-M12 PIEZOELASTIC VIBRATORY-CANTILEVER FORCE SENSORS AND AXIAL SENSITIVITY ANALYSIS FOR INDIVIDUAL TRIAXIAL TACTILE SENSING  
Kaoru Yamashita, Yi Yang, Takanori Nishimoto, Kazuya Furukawa, Minoru Noda  
Kyoto Institute of Technology, Japan

A3P-M13 A FLEXURAL PLATE WAVE (FPW) DEVICE WITH LOW INSERTION LOSS AND HIGH ELECTROMECHANICAL COUPLING COEFFICIENT  
I-Yu Huang, Chang-Yu Lin, Chian-Hao Sun  
National Sun Yat-sen University, Taiwan

A3P-M14 ALN/ZNO/SI STRUCTURE - A PACKAGELESS SOLUTION FOR ACOUSTIC WAVE SENSORS  
Ouadra Legrani1, Omar Elmaazia1, Philippe Pigeat1, Aurine Bartasyte1, Frederic Sarry1, Sergei Zhdan2  
(1)Institut Jean Lamour, CNRS-Nancy-Université, France; (2)Moscow Power Engineering Institute, Russia

A3P-M15 A NOVEL MICROMACHINED VISCOSITY AND DENSITY SENSOR BASED ON RESONANT TORSIONAL PADDLE  
Hao Li, Junbo Wang, Xiang Li, Deyong Chen  
Institute of Electronics, Chinese Academy of Sciences, China

A3P-M16 THE LOW POWER 3D-MAGNETOTRANSISTOR BASED ON CMOS TECHNOLOGY  
Chana Leepattaranapong1, Toempong Phetchakul1, Nantchapun Penpond2, Putter Pengpad4, Arckom Sripap4, Ekalak Chaowichart4, Charmed Hirunwan1, Amporn Poyai2  
(1)King Mongkut’s Institute of Technology, Thailand; (2)National Electronics and Computer Technology Center, Thailand

A3P-M17 IMPROVEMENT OF TACTILE CAPACITIVE SENSORS OF THE HUMANOID ROBOT ICUB’S FINGERTIPS  
Alberto Ascia, Maurizio Biso, Alberto Ansaldo, Alexander Schmitz, Davide Ricci, Lorenzo Natale, Giorgio Metta, Giulio Sandini  
Italian Institute of Technology, Italy
A3P-M18 A LOW POWER COMPACT CMOS PROGRAMMABLE TEMPERATURE SWITCH WITH PROCESS COMPENSATION
Zhiqing Geng, Wenfeng Lou, Nanjian Wu
Chinese Academy of Sciences, China

A3P-M19 WIDE-RANGE AC / DC EARTH LEAKAGE CURRENT SENSOR USING FLUXGATE WITH SELF-EXCITATION SYSTEM
Takahiro Kudo¹, Susumu Kurihara¹, Yasuhiro Takahashi²
¹Fuji Electric Co., Ltd., Japan; ²Fuji Electric FA Components & Systems Co., Ltd., Japan

A3P-M20 HIGH OVERTONE BULK ACOUSTIC RESONATORS BUILT ON SINGLE CRYSTAL STACKS FOR SENSORS APPLICATIONS
Sylvain Ballandras¹, Thomas Baron¹, Eric Lebrasseur¹, Gilles Martin¹, Sébastien Alzuaga¹, Jean-Michel Friedt¹, Jean-Claude Ponçot², Cédric Guichard²
¹FEMTO-ST Institute, France; ²Institut Pierre Vernier, France; ³SENISeOR SAS, France

A3P-M21 EXPERIMENTAL STUDY OF SINGLE LOOP SIGMA-Delta AND MULTI STAGE NOISE SHAPING (MASH) MODULATORS FOR MEMS ACCELEROMETER
Bader Almutairi, Michael Kraft
University of Southampton, United Kingdom

A3P-M22 A NOVEL WIRELESS PASSIVE TEMPERATURE SENSOR UTILIZING MICROFLUIDIC PRINCIPLES IN MILLIMETER-WAVE FREQUENCIES
Anya Traille², Sofiene Bouaziz², Herve Aubert¹, Patrick Pons¹, Manos Tentzeris²
¹CNRS-LAAS University of Toulouse, France; ²Georgia Institute of Technology, United States; ³Université de Toulouse, CNRS, LAAS, France

A3P-M23 A COIL-FREE DC MAGNETIC SENSOR UTILIZING MAGNETO-MECHANICAL DAMPING IN GIANT MAGNETOSTRICTIVE MATERIAL
Jitao Zhang¹, Ping Li¹, Yumei Wen¹, Xian Huang²
¹Chongqing University, China; ²College of Optoelectronic Engineering, Chongqing University, China

A3P-M24 MODELING AND DESIGN OF A PLANAR 3-AXIS MEMS RATE GYRO
Iannis Roland², Stève Masson², Olivier Ducloux², Olivier Le Traon², Nathalie Isac¹, Alain Bosseboeuf¹
¹Institut d’Electronique Fondamentale, France; ²Géona - The French Aerospace Lab, France

A3P-M25 DEVELOPMENT OF A SMART RFID-BASED CORROSION SENSOR
Walter Leon-Salas, Sirisha Kanneganti, Ceki Halmen
University of Missouri-Kansas City, United States

A3P-M26 DIFFERENT ELECTROSTATIC VOLTAGE SENSITIVITY IN THICKNESS AND LATERAL FIELD EXCITATION FILM BULK ACOUSTIC RESONATORS
X. Qiu, R. Tang, H. Huang, H. Yu, J. Oiler
Arizona State University, United States

A3P-M27 ANALYSIS OF THE EFFICIENCY OF SPINNING CURRENT TECHNIQUES THRU COMPACT MODELING
Morgan Madec, Jean-Baptiste Kammerer, Luc Hébrard, Christophe Lallement
InESS, France
**SATURDAY PROGRAM**

**SPECIAL SESSION A4L-D: AMBIENT INTELLIGENCE TECHNOLOGIES & APPLICATIONS**
Chairs: Javier Alonso & Joan G. Haro
Technical University of Cartagena

**SESSION A4L-E: FLEXIBLE SENSORS**
Chairs: Patrick Ponts, CNRS LAAS
Lei Wei, Massachusetts Institute of Technology

**SESSION A4L-F: OPTICAL BIOSENSORS**
Chairs: Shin-Won Kang, Kyungpook National University
Huikai Xie, University of Florida

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**16:00**

### A4L-D1
**INVITED: PERSUASIVE COMPUTING AT SCALE: CHALLENGES AND RESEARCH DIRECTIONS**
Paolo Bellavista
Università di Bologna, Italy

### A4L-E1
**FLEXIBLE FABRIC KEYBOARD WITH CONDUCTIVE POLYMER-COATED FIBERS**
Seiichi Takamatsu1, Takahiko Imai1, Takahiro Yamashita1, Takeshi Kobayashi2, Koji Miyake2, Toshihiko Itoh1
(1)Beans Laboratory, Japan; (2)National Institute of Advanced Industrial Science and Technology, Japan

### A4L-F1
**PHASE-BASED 3D OPTICAL FLOW SENSORS FOR MOTION DETECTION**
Albert Wang, Alyosha Molnar
Cornell University, United States

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**16:15**

### A4L-D2
**FLEXIBLE SILICON TRIAXIAL TACTILE IMAGER WITH INTEGRATED 800μM-PITCH SENSOR PIXEL STRUCTURES ON A DIAPHRAGM**
Hidekuni Takao1, Hiroki Okada2, Makoto Ishida2, Takasaiki Suzuki1, Fumikazu Oohira1
(1)Kagawa University, Japan; (2)Toyohashi University of Technology, Japan

### A4L-E2
**ANALYSIS, SIMULATION AND FABRICATION OF CURVED MULTIMORPHS THAT UNDERGO BENDING AND TWISTING**
Sagnik Pal, Huikai Xie
University of Florida, United States

### A4L-F2
**A NOVEL 1-GRAM INSECT BASED DEVICE MEASURING VISUAL MOTION ALONG 5 OPTICAL DIRECTIONS**
Frédéric Louis Roubieu1, Fabien Expert1, Marc Boyron2, Benoît-Jérémie Fuschloch2, Stéphane Viollet1, Franck Ruffier1
(1)CNRS / Aix-Marseille University, France; (2)CNRS/Aix-Marseille University, France; (3)Institute of Movement Sciences, CNRS / University of the Mediterranean, France

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**16:30**

### A4L-D3
**A FRAMEWORK FOR THE CONNECTIVITY OF AN INTERNET OF THINGS**
Daniel Corujo, Marcelo Lebre, Diogo Gomes, Rui Aguilar
Instituto de Telecomunicações, Portugal

### A4L-E3
**ANALYSIS, SIMULATION AND FABRICATION OF CURVED MULTIMORPHS**
Rui Aguiar, Daniel Corujo, Marcelo Lebre, Diogo Gomes, Rui Aguilar
Instituto de Telecomunicações, Portugal

### A4L-F3
**ULTRA-SMALL IMAGING SYSTEM FOR CELL PHONE CAMERA USING BIREFRINGENT LENSES**
Yupeng Zhang, Toshitsugu Ueda
Waseda University, Japan

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**16:45**

### A4L-D4
**MULTIMODAL BIOSENSOR DATA HANDLING FOR EMOTION RECOGNITION**
Filipe Canento1, Ana Fred1, Hugo Silva1, Hugo Gamboa1, André Lorencz1
(1)Instituto de Telecomunicações, Portugal; (2)Instituto de Telecomunicações, DEETC, ISEL-IPL, Portugal; (3)Instituto Superior Técnico, Portugal; (4)FLUX & CEFITEC, FCT-UNL, Portugal

### A4L-E4
**POLYMER MICRO-CANTILEVERS FOR THERMAL SENSING**
Lucy Williamson Hodge1, Richard Dunn2, Robert Ibbotson3, Eijaz Huq4, Ajoy Kar4
(1)Kingston University, United Kingdom; (2)Science and Technology-Facilities Council, United Kingdom

### A4L-F4
**OPTICAL SENSOR SYSTEM FOR PERIPHERAL VASCULAR DIAGNOSTICS OF THE PATIENTS BASED ON PULSE SPECTROSCOPY METHOD**
Sergej Andruschenko2, Ulrich Timm1, Sebastian Kobal1, Michael Hinze1, Jens Kraut1, Elfed Lewis1, Hartmut Ewald1
(1)University of Limerick, Ireland; (2)University of Rostock, Germany; (3)Universität Rostock, Germany

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**17:00**

### A4L-D5
**COLLABORATION OF SENSORS AND ACTUATORS THROUGH triple SPACES**
Altar Gómez-Góiri, Pablo Orduña, David Ausín, Miguel Emaldi, Diego López-De-Ipíña
DeustoTech - Universidad de Deusto, Spain

### A4L-E5
**DESIGN OF A PRINTABLE MULTIFUNCTIONAL SENSOR FOR REMOTE MONITORING**
Yi Feng, Qiang Chen, Li-Rong Zheng
Royal Institute of Technology, iPack Vinn Excellence Center, Sweden

### A4L-F5
**DEVELOPMENT OF WEARABLE SENSITIVE GLOVE EMBEDDED WITH HETERO-HORE FIBER-OPTIC NERVES FOR MONITORING FINGER JOINTS**
Kaori Onodera2, Kazuhiro Watanabe2, Michiko Nishiyama1
(1)Airframes and Structures Group, Aerospace Project Research Associate - JAXA, Japan; (2)SOKA University, Japan

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**17:15**

### A4L-D6
**LIMITED RESOURCES IN AMBIENT SYSTEMS FOR DISASTER SCENARIOS**
Pawel Kulakowski
AGH University of Science and Technology, Poland

### A4L-E6
**ORGANICALLY MODIFIED SILICATE FILM PH SENSOR FOR CONTINUOUS WOUND MONITORING**
Dietmar Puchberger-Engel1, Christian Krutzler2, Michael Vellekoop2
(1)Austrian Center for Medical Innovation and Technology, Austria; (2)Vrije University of Technology, Austria

### A4L-F6
**SPECTRA OPTICAL DETECTION OF BIOMOLECULES USING A WHITE LIGHT SPECTRUM BASED SPECTROPHOTOMETRIC PLATFORM**
Susana Cardoso1, Paulo Freitas1, Debora Ferreira2, Graça Minas2, Adélia Miranda2
(1)INESC-Microsistemas e Nanotecologias (INESC-MN)&Instituto Superior Técnico, Portugal; (2)INESC-Microsistemas e Nanotecologias (INESC-MN)&Instituto de Nanociências e Nanotecnologias(IN), Portugal; (3)International Iberian Nanotechnology Laboratory INL, Portugal; (4)Universidade do Minho, Portugal

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**OPTIONAL ENTERTAINMENT & DINNER | 20:45 - 22:15**
### SPECIAL SESSION B1L-A: NANO TECHNOLOGY AND BIOSENSING
**Chairs:**
Aime Lay-Ekuakille, University of Salento
Alessandro Massaro, Italian Institute of Technology

<table>
<thead>
<tr>
<th>B1L-A1</th>
<th>INVITED: DESIGN OF NANO STRUCTURED SOL-GEL COATINGS FOR (BIO)SENSING APPLICATIONS</th>
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<tr>
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<td>Emmanuel Scolan, Rolf Steiger, Raphaël Pugin, Bastien Schyr, Stéphanie Pasche, Bernard Wenger, Guy Voirin</td>
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<td>CSEM SA, Switzerland</td>
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### SESSION B1L-B: MECHANICAL PARTICLE SENSORS
**Chairs:**
Hans JFL Goosen, TU Delft
Mina Rais-Zadeh, University of Michigan

<table>
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<tr>
<th>B1L-B1</th>
<th>SELF-EXCITING AND SELF-SENSING RESONANT CANTILEVER SENSORS FOR IMPROVED MONITORING OF AIRBORNE NANO PARTICLES EXPOSURE</th>
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<tbody>
<tr>
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<td>Hutomo Suryo Wasisto1, Lutz Doering2, Stephan Merzsch3, Andreas Waag4, Erwin Peiner5</td>
</tr>
<tr>
<td></td>
<td>(1)Fraunhofer Institute for Wood Research - Wilhelm-Klauditz-Institut, Germany; (2)Physikalisch-Technische Bundesanstalt, Germany; (3)Technische Universität Braunschweig, Germany</td>
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### SESSION B1L-C: INTEGRATED SENSOR INTERFACES
**Chairs:**
Michiel Pertijs, TU Delft
Saí-Wen Sin, University of Macau

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<th>B1L-C1</th>
<th>STANDARD 0.18UM 1P6M CMOS IC FOUNDRY FLOW FOR ACCELEROMETER, ANALOG READOUT CIRCUIT AND WAFER LEVEL CAPPING PACKAGE INTEGRATION</th>
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<td>Chien-Jo Huang1, Che-Sheng Chien2, Kuei-Ann Wen3, Yu-Ting Cheng4, Jen-Yi Chen5, Chao-Sen Chang6, Wen-Chieh Chou7</td>
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<tr>
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<td>(1)Global Sensing Core, Inc., Taiwan; (2)National Chiao Tung University, Taiwan</td>
</tr>
</tbody>
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### Sunday Program

#### B1L-A:
**9:00**
**SESSION B1L-B:**
**9:30**
**SESSION B1L-C:**

#### B1L-A3
**HIGHLY DISPERSED PT NANO PARTICLES DECORATED CARBON NANO COMPOSITE (PT20/C80) FOR SENSITIVE NONENZYMATIC GLUCOSE DETERMINATION AND FORMIC ACID OXIDATION**
Baijt Singh, Eithne Dempsey
ITT Dublin, Institute of Technology Tallaght, Ireland

#### B1L-B3
**ENHANCED AIRBORNE NANO PARTICLES MASS SENSING USING A HIGH-MODE RESONANT SILICON CANTILEVER SENSOR**
Hutomo Suryo Wasisto1, Stephan Merzsch2, Andreas Waag3, Ina Kirsch4, Erwin Peiner5
(1)Fraunhofer Institute for Wood Research - Wilhelm-Klauditz-Institut, Germany; (2)Technische Universität Braunschweig, Germany

#### B1L-C3
**VOLTAGE-TO-FREQUENCY CONVERTER FOR LOW-POWER SENSOR INTERFACES**
Cristina Azcona, Belén Calvo, Nicolás Medrano, Santiago Celma
Universidad de Zaragoza, Spain

### A Single Chip Fluorometer for Fluorescence Lifetime Spectroscopy in 65nm CMOS
Jian Guo, Sameer Sonkusale
Tufts University, United States
SPECIAL SESSION B1L-A: NANOTECHNOLOGY AND BIOSENSING
(CONT’D)

CONCERT HALL

SESSION B1L-B: MECHANICAL PARTICLE SENSORS
(CONT’D)

JEAN MONET

SESSION B1L-C: INTEGRATED SENSOR INTERFACES
(CONT’D)

JOHN HOLLAND

B1L-A6
NOVEL IMAGING METHOD AND OPTIMIZED DEMODULATION PIXELS FOR WIDE-FIELD FLUORESCENCE LIFETIME IMAGING MICROSCOPY
Lysandre-Edouard Bonjour1, Amandev Singh1, Thomas Baechler1, Maher Kayal2
(1)CSEM SA, Switzerland; (2) École Polytechnique Fédérale de Lausanne, Switzerland

B1L-C6
SIC BASED FIELD EFFECT TRANSISTOR FOR H2S DETECTION
Zhaflira Darmastuti2, Mike Andersson1, Mikael Larsson1, Niclas Lindqvist1, Lars Ojamae1, Anita Lloyd Spetz2
(1)Alstom Power, Sweden; (2) Linköping University, Sweden

B1L-B6
VOLATILE-BASED RATIOMETRIC INFOCHEMICAL COMMUNICATION SYSTEM USING POLYMER-COATED PIEZOELECTRIC SENSOR ARRAYS
Zoltan Rácz, Julian Gardner, Marina Cole, Yang Jian
University of Warwick, United Kingdom

BREAK | 10:30- 11:00 | FOUNDATION BUILDING - ATRIUM
INVITED: NANOCOMPOSITES FOR MULTIMODAL MOLECULAR IMAGING
Sergio Casciaro¹, Antonio Greco¹, Ernesto Casciaro¹, Francesco Conversano¹, Aimé Lay-Ekuakille²
¹National Research Council, IFC, Italy; ²Università del Salento, Italy

EXPERIMENTAL ASSESSMENT OF GOLD NANORODS FOR OPTOACOUSTIC IMAGING IN A TISSUE-MIMICKING PHANTOM
Giulia Soloperto², Francesco Conversano², Antonio Greco², Sergio Casciaro², Andrea Ragusa¹
¹National Nanotechnology Laboratory, CNR-NANO, Italy; ²National Research Council, IFC, Italy

A NOVEL DUAL-FREQUENCY METHOD FOR SELECTIVE ULTRASOUND IMAGING OF TARGETED NANOPARTICLES
Francesco Conversano¹, Antonio Greco¹, Ernesto Casciaro¹, Sergio Casciaro², Aimé Lay-Ekuakille¹
¹National Research Council, IFC, Italy; ²Università del Salento, Italy

THE USE OF THERMAL EFFECTS FOR INCREASING THE RESPONSIVITY OF PYROELECTRIC DETECTORS
Yvonne Querner, Volkmar Norkus, Gerald Gerlach
Technische Universität Dresden, Germany

LOW-FREQUENCY ULTRASOUND CONTRAST ENHANCEMENT BEHAVIOR OF A NEW NANO-SYSTEM
Antonio Greco, Francesco Conversano, Giulia Soloperto, Roberto Franchini, Sergio Casciaro, Luca Menichetti
National Research Council, IFC, Italy

A NOVEL SINGLE SLOPE ADC DESIGN FOR WIDE DYNAMIC RANGE CMOS IMAGE SENSORS
Shang-Fu Yeh², Chih-Cheng Hsieh², Chiao-Jen Cheng¹, Chun-Kai Liu¹
¹Elan Microelectronics Corporation, Taiwan; ²National Tsing Hua University, Taiwan

DIFFERENTIAL PULSE-WIDTH PAIR BOTDA WITH FAST FALLTIME PULSES
Aldo Minardo², Luigi Zeni³, Romeo Bernini¹
¹National Research Council, IREA, Italy; ²Second University of Naples, Italy; ³Università degli Studi di Napoli Federico II, Italy

THE USE OF THERMAL EFFECTS FOR INCREASING THE RESPONSIVITY OF PYROELECTRIC DETECTORS
Yvonne Querner, Volkmar Norkus, Gerald Gerlach
Technische Universität Dresden, Germany

LIGHT-EMITTING DIODE JUNCTION-TEMPERATURE SENSING USING DIFFERENTIAL VOLTAGE/CURRENT MEASUREMENTS
Folkert Roscam Abbing, Michiel Pertijs
Delft University of Technology, Netherlands

TEMPERATURE MAPPING FROM MOLECULAR ABSORPTION TOMOGRAPHY
Michael Wood, Krikor Ozanyan
University of Manchester, United Kingdom

A 53.4 UW CMOS TEMPERATURE SENSOR WITH AN INACCURACY OF ±1.9°C FROM -65°C TO 165°C
Mitchell Sheng-Cheng Lee, Teng-Cheng Chen, Chia-Yi Liou, Herming Chiueh
NCTU, Taiwan

DIFFERENTIAL PULSE-WIDTH PAIR BOTDA WITH FAST FALLTIME PULSES
Aldo Minardo², Luigi Zeni³, Romeo Bernini¹
¹National Research Council, IREA, Italy; ²Second University of Naples, Italy; ³Università degli Studi di Napoli Federico II, Italy

THE USE OF THERMAL EFFECTS FOR INCREASING THE RESPONSIVITY OF PYROELECTRIC DETECTORS
Yvonne Querner, Volkmar Norkus, Gerald Gerlach
Technische Universität Dresden, Germany
WEB-BASED SENSOR STREAMING WEARABLE FOR RESPIRATORY MONITORING APPLICATIONS
Carlos Rovira1, Shirley Coyle2, Brian Corcoran2, Dermot Diamond2, Tomas Ward2, Aaron McCoy4, Florin Stroiescu4, Kieran Daly4
{1}Clarity Centre for Sensor Web Technologies / Tyndall National Institute, Ireland; {2}Dublin City University, Ireland; {3}National University of Ireland Maynooth, Ireland; {4}Shimmer Research, Ireland

OVERCOMING BODY OBSTRUCTION FOR ROBUST DATA COMMUNICATION IN WIRELESS BODY SENSOR NETWORKS BY PLACING RELAY NODES
Chun-Yu Lin, Yi-Yin Chang, Kuan-Chung Ding, Chung-Ta King
National Tsing Hua University, Taiwan

ON-BODY TO ON-BODY CHANNEL CHARACTERIZATION
Fabio Di Franco, Christos Tachtatzis, Ben Graham, David Tracey, Nick Timmons, Jim Morrison
Letterkenny Institute of Technology, Ireland

ENERGY-EFFICIENT TIME-STAMPLESS ADAPTIVE NONUNIFORM SAMPLING
Soheil Feizi, Georgios Angelopoulos, Vivek Goyal, Muriel Médard
Massachusetts Institute of Technology, United States

CONFIDENCE LEVEL ANALYSIS OF SENSING SPATIAL COVERAGE IN WIRELESS SENSOR NETWORKS
Hamid Rafei Karkvandi, Efraim Pecht, Orly Yadid-Pecht
University of Calgary, Canada

B2L-D1
WEB-BASED SENSOR STREAMING WEARABLE FOR RESPIRATORY MONITORING APPLICATIONS
Carlos Rovira1, Shirley Coyle2, Brian Corcoran2, Dermot Diamond2, Tomas Ward2, Aaron McCoy4, Florin Stroiescu4, Kieran Daly4
{1}Clarity Centre for Sensor Web Technologies / Tyndall National Institute, Ireland; {2}Dublin City University, Ireland; {3}National University of Ireland Maynooth, Ireland; {4}Shimmer Research, Ireland

B2L-D2
OVERCOMING BODY OBSTRUCTION FOR ROBUST DATA COMMUNICATION IN WIRELESS BODY SENSOR NETWORKS BY PLACING RELAY NODES
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1) Analog Devices Inc, Ireland; 2) Quadrant Engineering, United States

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<td><strong>B4L-A5</strong> NANOELECTRODE ARRAYS FOR MEASURING SYMPATHETIC NERVOUS ACTIVITY Aamer Mahmood2, Peng-Sheng Chen1, A. George Akkinga1</td>
<td><strong>B4L-B5</strong> A 105-NW CMOS THERMAL SENSOR FOR POWER-AWARE APPLICATIONS Toshi Nagayama, Tetsuya Hirose, Yui Osaki, Nobutaka Kuroki, Masahiro Numa Kobe University, Japan</td>
<td><strong>B4L-C6</strong> INCORPORATION OF OPTICAL ENZYMATIC SENSING CHEMISTRY INTO BIODEGRADABLE HYDROGELS Jason Roberts, Bradley Collier, Michael McShane Texas A&amp;M University, United States</td>
</tr>
<tr>
<td>(1)Indiana University, United States; (2)Purdue University, United States</td>
<td></td>
<td><strong>B4L-B6</strong> THERMAL HISTORY SENSING INSIDE HIGH-EXPLOSIVE ENVIRONMENTS USING THERMOLUMINESCENT MICROPARTICLES Merlin Mah1, Philip Armstrong1, Sangho Kim2, Joel Carney1, James Lightstone1, Joseph Talghader2</td>
</tr>
<tr>
<td></td>
<td>(1)Naval Surface Warfare Center, United States</td>
<td>(1)Idaho Head Division, Naval Surface Warfare Center, United States; (2)University of Minnesota, United States</td>
</tr>
</tbody>
</table>

**SUNDAY PROGRAM**

**CONCERT HALL**

15:15

**B4L-C1** A STEP TOWARDS THE PREDICTION OF A ROCK COLLAPSE: ANALYSIS OF MICRO-ACOUSTIC BURSTS Cesare Alippi, Giacomo Boracchi, Antonio Marullo, Manuel Roveri Politecnico di Milano, Italy

15:30

**B4L-C2** MONITORING OF MINING INDUCED SUBSIDENCE THROUGH MEASUREMENT OF GROUND STRAINS WITH FIBER BRAGG GRATING SENSORS Giorgio Nosenzo Monitor Optics Systems, Ireland

15:45

**B4L-C3** AN ULTRA-LOW NOISE MEMS ACCELEROMETER FOR SEISMIC IMAGING Don Milligan, Brian Homeijer, Robert Walmsley Hewlett-Packard, United States

16:00

**B4L-C4** REMOTE SENSOR FOR WINTER ROAD SURFACE STATUS DETECTION Patrik Jonsson Mid Sweden University, Sweden

16:15

**B4L-C5** A MINIATURISED ARROW BALLISTIC MEASUREMENT SYSTEM John Barton2, Jan Vcelak2, Javier Torres-Sanchez2, Brendan O’Flynn1, Cian O’Mathuna1, Robert Donahoe1

16:30

**B4L-C6** INCORPORATION OF OPTICAL ENZYMATIC SENSING CHEMISTRY INTO BIODEGRADABLE HYDROGELS Jason Roberts, Bradley Collier, Michael McShane Texas A&M University, United States
SESSION B4L-D: WIRELESS INTERFACES
Chair: Peter S.-K. Liao, National Taiwan University of Science & Technology
Tiqiang Ning, Beijing Jiaotong University

15:15

B4L-D1
POWERING WIRELESS SENSORS: MICROTECHNOLOGY-BASED LARGE-AREA THERMOELECTRIC GENERATOR FOR MASS APPLICATIONS
Gunnar Pasold1, P. Ettin2, Marcus Hahn3, Uwe Muster4, Váhe Nersessian5, Donato Bonfrate6, Rudolf Buser1, Marco Cucinelli1, Martin Gutsche1, Marcel Kehl1, Nicolas Zäch1, Roger Hazelden1
(1)Untersuchungskonzentrale Hochschule für Technik Buchs NTB, Switzerland; (2)TRW Conkul, United Kingdom; (3)TRW Switzerland GmbH, Switzerland

B4L-D2
ELECTROMAGNETIC CONTACTLESS INTERROGATION TECHNIQUE FOR QUARTZ RESONATOR SENSORS
Marco Baú1, Marco Ferrari1, Vittorio Ferrari1, Emanuele Tonoli1
Università degli Studi di Brescia, Italy

15:30

B4L-D3
A POWER SENSOR UNIT FOR THE LOCALIZATION OF GSM MOBILE PHONES FOR SEARCH AND RESCUE APPLICATIONS
Stefani Zorn1, Gabor Bozsik1, Richard Rose1, Alexander Goetz1, Robert Weigel1, Alexander Koelpin1
Universität Erlangen-Nürnberg, Germany

B4L-D4
A NOVEL MICROWAVE POWER SENSOR USING MEMS FIXED-FIXED BEAM
Yan Cui1, Xiao Ping Liao2, Zheng Zhu1
(1)Key Laboratory of MEMS of Ministry of Education, Southeast University, China; (2)Southeast University, China

16:00

B4L-D5
NOVEL NARROWBAND ACOUSTIC SENSORS FOR SUB-GHZ WIRELESS MEASUREMENTS
David Rabus1, Thomas Baron1, Eric Lebrasseeur2, Sébastien Azuaga3, Gilles Martin3, Sylvain Ballandras3, Jean-Michel Friedt1
(1)FEMTO-ST Institute, France; (2)SENSeOR SAS, France

B4L-D6
MAGNETOELECTRIC EFFECT IN COMPOSITE OF FERROMAGNETIC CONSTANT-ELASTICITY ALLOY PIEZOELECTRIC CERAMIC AND FESIB RIBBON
Caiijang Lu, Ping Li, Yumei Wen, Aichao Yang
Chongqing University, China

DINNER | 19:00 - 22:00 | THOMAND PARK
**SPECIAL SESSION C1L-D: INTELLIGENT WEARABLE WIRELESS INERTIAL MEASUREMENT**

**Chairs:** Michael Walsh & Clán O’Mathúna, Tyndall National Institute

**Invited: Wearable Wireless Sensing for Sports and Ubiquitous Interactivity**
Michael Lapinski, Mark Feldmeier, Joseph Paradiso
Massachusetts Institute of Technology, United States

**An Inertial Smart-Sensor Based on Silicon Nanowires for Wireless Sportive Activity Monitoring**
Olivier Leman², El Mehdi Boujamaa², Wenceslas Rahajandraibe², Edith Kussener², Stephane Meillère², Hervé Barthélémy², Guillaume Jourdan¹, Patrice Rey¹
{¹}CEA-Leti, France; {²}IM2NP - CNRS / Aix-Marseille University, France

**Two Stage Kalman Filtering for Position Estimation Using Dual Inertial Measurement Units**
Nagesh Yadav, Chris Bleakley
University College Dublin, Ireland

**A Microfabricated Platform for Three-Dimensional Microsystems**
Grant McCallum, Rasa Lahiji, Mehran Moghaddam
Case Western Reserve University, United States

**Design and Fabrication of Electro-Thermally Activated Micro Gripper with Large Tip Opening and Holding Force**
Jay Jamshid Khazaai, Hongwei Qu, Meir Shillor, Lorenzo Smith
Oakland University, United States

**Multi-Axis Flexible Force Sensor for Tactile Display**
Baekchul Kim, Seunghoon Shin, Yungkwan Lee, Jaedo Nam, Hyok Ryed Choi, Hyungpil Moon, Jachoon Koo
Sungkyunkwan University, Korea, South

**Proposed Digital, Auto Ranging, Self Calibrating Inertial Sensor**
Paul Swanson, Charles Tally, Richard Waters
S3C Pacific, United States

**A Physiological Camera Shake Model for Image Stabilization Systems**
Fabien Gavant, Laurent Alacoque, Antoine Dupret, Dominique David
CEA-Leti, France

**Multi-Sensor Classification of Tennis Strokes**
Damien Connaghan², Phillip Kelly², Noel E. O’Connor², Mark Gaffney², Michael Walsh¹, Cian O’Mathúna¹
{¹}(1)Clarity Centre for Sensor Web Technologies / Tyndall National Institute, Ireland; (2)Dublin City University, Ireland; (3)Tyndall National Institute, Ireland

**Capturing the Overarm Throw in Darts Employing Wireless Inertial Measurement**
Michael Walsh¹, John Barton³, Brendan O’Flynn¹, Cian O’Mathúna¹, Magdelena Tyndyk²
{¹}(1)Clarity Centre for Sensor Web Technologies / Tyndall National Institute, Ireland; (2)MEDIC Cork Institute of Technology, Ireland; (3)Tyndall National Institute, Ireland

**A User-Independent Sensor Gesture Interface for Embedded Device**
Xiaoyan Dang², Wei Wang², Kevin Wang², Mingzhong Dong¹, Liang Yin¹
(1)Beijing University of Posts and Telecommunications, China; (2)Intel Labs China, China

**Fiber Bragg Distributed Chemical Sensor**
Arjen Boersma, Marco Consales⁴, Antonello Cutolo⁴, Andrea Cusano⁴, Giovanni Breglio⁵, Salvatore Buontempo⁵, Paolo Petagna¹, Michele Gigando⁵
{¹}(1)European Organization for Nuclear Research, Switzerland; (2)Istituto Nazionale di Fisica Nucleare, Italy; (3)National Research Council, IMCB, Italy; (4)Università degli Studi del Sannio, Italy; (5)Università degli Studi di Napoli Federico II, Italy

Gaia Berruti¹, Marco Consales⁴, Antonello Cutolo⁴, Andrea Cusano⁴, Giovanni Breglio⁵, Salvatore Buontempo⁵, Paolo Petagna¹, Michele Gigando⁵
{¹}(1)European Organization for Nuclear Research, Switzerland; (2)Istituto Nazionale di Fisica Nucleare, Italy; (3)National Research Council, IMCB, Italy; (4)Università degli Studi del Sannio, Italy; (5)Università degli Studi di Napoli Federico II, Italy

**Miniaturized Photonic Crystal Fiber Tip Sensor for Refractive Index Sensing**
Dora Juan Juan Hu¹, Jun Long Lim¹, Yixin Wang¹, Perry Ping Shum¹
{¹}(1)A*STAR Institute of High Performance Computing, I2R, Singapore; (2)Nanyang Technological University, Singapore

**Simultaneous Measurement of Temperature and Strain Distribution Using Brillouin Scattering in Dispersion-Shifted Fibers**
Aleskander Wosniok, Katerina Krebber
BAM Federal Institute for Materials Research and Testing, Germany

**SESSION C1L-E: MULTI-AXIS SENSORS**

**Chairs:** Maryam Ziaei-Moayyed, Sandia National Labs
Marco Grassi, University of Pavia

**SESSION C1L-C: OPTICAL SENSORS & SYSTEMS I**

**Chairs:** Nan-Kuang Chen, National United University
Olga Conde, Universidad de Cantabria

**MONDAY PROGRAM**

**9:00**

**C1L-D1**
Invited: Wearable Wireless Sensing for Sports and Ubiquitous Interactivity
Michael Lapinski, Mark Feldmeier, Joseph Paradiso
Massachusetts Institute of Technology, United States

**C1L-E1**
A Microfabricated Platform for Three-Dimensional Microsystems
Grant McCallum, Rasa Lahiji, Mehran Moghaddam
Case Western Reserve University, United States

**C1L-F1**
Resonance-Based Optical Fiber Refractometers
Carlos Ruiz Zamarreño, Sergio Lopez, Miguel Hernaez, Ignacio Del Villar, Ignacio Raul Matias, Francisco Javier Arregui
Universidad Pública de Navarra, Spain

**9:15**

**C1L-D2**
Design and Fabrication of Electro-Thermally Activated Micro Gripper with Large Tip Opening and Holding Force
Jay Jamshid Khazaai, Hongwei Qu, Meir Shillor, Lorenzo Smith
Oakland University, United States

**C1L-E2**
Multi-Axis Flexible Force Sensor for Tactile Display
Baekchul Kim, Seunghoon Shin, Yungkwan Lee, Jaedo Nam, Hyok Ryed Choi, Hyungpil Moon, Jachoon Koo
Sungkyunkwan University, Korea, South

**C1L-F2**
Curved Tapered Optical Fibre Surface Pressure Sensor
Matthew Partridge, Renata Jarzewska, Séamus Higson, Frank Davis, Stephen James, Ralph Tatam
Cranfield University, United Kingdom

**9:30**

**C1L-D3**
An Inertial Smart-Sensor Based on Silicon Nanowires for Wireless Sportive Activity Monitoring
Olivier Leman², El Mehdi Boujamaa², Wenceslas Rahajandraibe², Edith Kussener², Stephane Meillère², Hervé Barthélémy², Guillaume Jourdan¹, Patrice Rey¹
{¹}(1)CEA-Leti, France; {²}IM2NP - CNRS / Aix-Marseille University, France

**C1L-E3**
Multi-Axis Flexible Force Sensor for Tactile Display
Baekchul Kim, Seunghoon Shin, Yungkwan Lee, Jaedo Nam, Hyok Ryed Choi, Hyungpil Moon, Jachoon Koo
Sungkyunkwan University, Korea, South

**C1L-F3**
Simultaneous Measurement of Temperature and Strain Distribution Using Brillouin Scattering in Dispersion-Shifted Fibers
Aleskander Wosniok, Katerina Krebber
BAM Federal Institute for Materials Research and Testing, Germany

**9:45**

**C1L-D4**
Two Stage Kalman Filtering for Position Estimation Using Dual Inertial Measurement Units
Nagesh Yadav, Chris Bleakley
University College Dublin, Ireland

**C1L-E4**
Proposed Digital, Auto Ranging, Self Calibrating Inertial Sensor
Paul Swanson, Charles Tally, Richard Waters
S3C Pacific, United States

**C1L-F4**
Fiber Bragg Distributed Chemical Sensor
Arjen Boersma, Milan Saalmink, Timme Lucassen, Sjojke Wiegersma, Rob Jansen, Rik Jansen, Lun Cheng
TNO, Netherlands

**10:00**

**C1L-D5**
Multi-Sensor Classification of Tennis Strokes
Damien Connaghan², Phillip Kelly², Noel E. O’Connor², Mark Gaffney², Michael Walsh¹, Cian O’Mathúna¹
{¹}(1)Clarity Centre for Sensor Web Technologies / Tyndall National Institute, Ireland; (2)Dublin City University, Ireland; (3)Tyndall National Institute, Ireland

**C1L-E5**
A Physiological Camera Shake Model for Image Stabilization Systems
Fabien Gavant, Laurent Alacoque, Antoine Dupret, Dominique David
CEA-Leti, France

**C1L-F5**
Gaia Berruti¹, Marco Consales⁴, Antonello Cutolo⁴, Andrea Cusano⁴, Giovanni Breglio⁵, Salvatore Buontempo⁵, Paolo Petagna¹, Michele Gigando⁵
{¹}(1)European Organization for Nuclear Research, Switzerland; (2)Istituto Nazionale di Fisica Nucleare, Italy; (3)National Research Council, IMCB, Italy; (4)Università degli Studi del Sannio, Italy; (5)Università degli Studi di Napoli Federico II, Italy

**10:15**

**C1L-D6**
Capturing the Overarm Throw in Darts Employing Wireless Inertial Measurement
Michael Walsh¹, John Barton³, Brendan O’Flynn¹, Cian O’Mathúna¹, Magdelena Tyndyk²
{¹}(1)Clarity Centre for Sensor Web Technologies / Tyndall National Institute, Ireland; (2)MEDIC Cork Institute of Technology, Ireland; (3)Tyndall National Institute, Ireland

**C1L-E6**
A User-Independent Sensor Gesture Interface for Embedded Device
Xiaoyan Dang², Wei Wang², Kevin Wang², Mingzhong Dong¹, Liang Yin¹
(1)Beijing University of Posts and Telecommunications, China; (2)Intel Labs China, China

**C1L-F6**
Miniaturized Photonic Crystal Fiber Tip Sensor for Refractive Index Sensing
Dora Juan Juan Hu¹, Jun Long Lim¹, Yixin Wang¹, Perry Ping Shum¹
{¹}(1)A*STAR Institute of High Performance Computing, I2R, Singapore; (2)Nanyang Technological University, Singapore

**BREAK | 10:30- 11:00 | FOUNDATION BUILDING - ATRIUM**
<table>
<thead>
<tr>
<th>SESSION C2L-A: BIOMEDICAL MONITORS</th>
<th>SESSION C2L-B: INTEGRATED SENSORS</th>
<th>SESSION C2L-C: FLUID PROPERTY SENSORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairs: Jin-Chern Chio, National Chiao Tung University Rosalind Wynne, Villanova University</td>
<td>Chairs: Michel Pertjls, TU Delft Sai-Weng Sin, University of Macau</td>
<td>Chairs: Qing-An Huang, Southeast University-Nanjing Colin Fitzpatrick, University of Limerick</td>
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</tbody>
</table>

### C2L-A1
**SELF-POWERED WIRELESS URINARY INCONTINENCE SENSOR FOR DISPOSABLE DIAPERS**
Ami Tanaka, Takahiro Yamanaka, Hirofumi Yoshioka, Kensuke Kobayashi, Takakuni Douseki

**University of California, Los Angeles, United States**

### C2L-A2
**A POCKET-SIZED COLORIMETRIC URINE READER FOR TELEMEDICINE IN THE DEVELOPING COUNTRIES**
Owe-Sik Lee1, Won Ick Jang1, Mun Yeon Jung1, Byung Gu Jeon3, Chunhua Ihm2

**Tsing Hua University, Taiwan**

### C2L-A3
**EMBEDDED MULTIPLEXED POLYMER OPTICAL FIBER SENSOR FOR ESOPHAGEAL MANOMETRY**
Bram Van Hoe1, Erwin Bosman3, Jeroen Missinne2, Geert Van Steenberge3, Peter Van Daele3, Wei Zhang1, Ian Johnson1, Kate Sugden1, David J. Webb1, Kyriacos Kalli2

**University of California, Los Angeles, United States**

### C2L-A4
**AN INFORMATION SENSOR WITH IN-PIXEL-PROCESSING FOR GERIATRIC NURSING**
Chin Yin1, Chih-Cheng Hei2h, Wen-Hsu Chang1, Ying-Zong Juang1, Chin-Fong Chiu1

**National Chiao Tung University**

### C2L-A5
**MEDICAL DIAGNOSTIC-BASED SENSOR SELECTION**
James Bradley Wendt, Miodrag Potkonjak

**University of California, Los Angeles, United States**

### C2L-A6
**A MICRO-POWER HIGH-RESOLUTION SIGMA-DELTA CMOS TEMPERATURE SENSOR**
Souha Hacine, Tanik El Khach, Frederick Maillly, Laurent Latombe, Pascal Nouet

**LIRMM, France**

### C2L-B1
**AN IMPLANTABLE HUMIDITY-TO-FREQUENCY SENSOR IN CMOS TECHNOLOGY**
Dominik Cimrakir, Andreas Demosthenous, Nooshin Saeidi, Anne Vanhoest, Nick Donaldson

**University College London, United Kingdom**

### C2L-B2
**CW METAL DETECTOR BASED ON AMR SENSOR ARRAY**
Michal Janosek, Jan Vyhnanek, Pavel Ripka

**Aston University, United Kingdom**

### C2L-B3
**A NOVEL APPROACH FOR ACHIEVING BULK SILICON MEMS ON CMOS SUBSTRATE BY AU-AU BONDING**
Chun-Hua Cai, Ming Qin

**Southeast University, China**

### C2L-B4
**A WIRELESS PASSIVE SENSOR FOR PH MONITORING EMPLOYING TEMPERATURE COMPENSATION**
Sharmistha Bhadra, Greg Bridges, Douglas Thomson, Michael Freund

**University of Manitoba, Canada**

### C2L-B5
**SILICON MULTI-STAGE CURRENT-MODE PIEZORESISTIVE PRESSURE SENSOR WITH ANALOG TEMPERATURE COMPENSATION**
Guilherme Coraucci1, Fabiano Fruett2, Saulo Finco1

**Center for Information and Technology Renato Archer, Brazil**

### C2L-B6
**A MICRO-POWER HIGH-RESOLUTION SIGMA-DELTA CMOS TEMPERATURE SENSOR**
Souha Hacine, Tanik El Khach, Frederick Maillly, Laurent Latombe, Pascal Nouet

**LIRMM, France**

### C2L-B7
**A VISCOSITY SENSOR UTILIZING AN ELECTROMAGNETICALLY ACTUATED OSCILLATING SPHERE**
Stefan Clara, Hannes Antlinger, Bernhard Jakoby

**Johannes Kepler Universitit, Austria**

### C2L-B8
**A NOVEL APPROACH FOR ACHIEVING BULK SILICON MEMS ON CMOS SUBSTRATE WITH ANALOG TEMPERATURE COMPENSATION**
Chun-Hua Cai, Ming Qin

**Southeast University, China**

### C2L-C1
**DENSITY SENSITIVE DRIVING MODE OF A DOUBLE MEMBRANE VISCOMETER**
Bernard Weiss1, Martin Heinisch1, Bernhard Jakoby2, Erwin K. Reichel3

**Institute for Automation and Communication, Germany**

### C2L-C2
**INVESTIGATION OF FABRICATING A LINDBORG ULTRASONIC PHASED ARRAY TRANSUDER OF MORE THAN 100 MHZ**
Jinying Zhang1, Wei-jang Xu2, Julien Carlier4, Kinning Ji, Bertrand Maugillard1, Samuel Queste5, Yiping Huang6

**University of Macau**

### C2L-C3
**INFLUENCE OF NON-NEWTONIAN FLUID DYNAMICS ON SAW INDUCED ACOUSTIC STREAMING IN VIEW OF BIOLOGICAL APPLICATIONS**
Subramaniam Kamakaranarayanan1, Reetu Singh2, Venkat Bhethanabotla3

**University of Limerick, Ireland**

### C2L-C4
**A DOUBLE MEMBRANE VISCOMETER**
Ke1, Martin Heinisch1, Bernhard Jakoby2, Erwin K. Reichel3

**University of Macau**

### C2L-C5
**A MODIFIED 3D FAST MARCHING SIMULATION FOR THICK PHOTORESISTS LITHOGRAPHY**
Lai-Fa Zhou1, Wei-Hua Li2, Bei Chen1, Xiao-Qian Li1, Qing-An Huang2

**Key Laboratory of MEMS of Ministry of Education, Southeast University, China**

### C2L-C6
**DETERMINING LIQUID PROPERTIES BY EXTRAORDINARY ACOUSTIC TRANSMISSION THROUGH PHONONIC CRYSTALS**
Ralf Lucklum1, Mikhail Zubtsov2, Manzhu Ke3, Alexander Oseev2, Ulrike Hempel1, Bernd Hennig1

**Institute for Automation and Communication, Germany**

### LUNCH | 12:30-13:30 | MAIN BUILDING - EDEN, RED RAISON RESTAURANT
C3P-J1  INFLUENCE OF AMBIENT TEMPERATURE ON THE PERFORMANCE OF VCSEL BASED SELF-MIXING SENSORS: FLOW MEASUREMENTS
Ranveer Matharu1, Julien Perchoux2, Aleksandar Rakic2
1Université de Toulouse, CNRS, LAAS, France; 2University of Queensland, Australia

C3P-G1  DOPPELLAB: TOOLS FOR EXPLORING AND HARNESSING MULTIMODAL SENSOR NETWORK DATA
Gershon Dublon, Laurel Pardue, Brian Mayton, Noah Swartz, Nicholas Joliat, Patrick Hurst, Joseph Paradiso
Massachusetts Institute of Technology, United States

C3P-G2  MONITORING PHYSICAL SPACE USING MOBILE PHONES FOR INFERRING SOCIAL AND CONTEXTUAL INTERACTIONS
Athanasios Antoniou, Evangelos Theodoridis, Ioannis Chatzigiannakis, Georgios Mylonas
Computer Technology Institute and Press, Greece

C3P-G3  WEB-BASED MONITORING OF YEAR-LENGTH DEPLOYMENT OF AUTONOMOUS GAS SENSING PLATFORMS ON LANDFILL SITES
Flachra Collins, Dylan Orpen, Cormac Fajy, Colum Foley, Alan Smeaton, Dermot Diamond
Dublin City University, Ireland

C3P-G4  INTEGRATION OF SMART HOUSE SENSORS INTO A FULLY NETWORKED (WEB) ENVIRONMENT
Daniele Trinchero1, Riccardo Stefanelli1, Davide BrunaZZi1, A. Casalegno2, M. Durando2, A. Galardini1
(1)Politecnico di Torino, Italy; (2)Torino Piemonte Internet Exchange, Italy

C3P-G5  ENABLING GLOBALLY UNIQUE SENSOR ID WITH DUAL-INTERFACE RF TAG
Jin Mitsugi1, Hisakazu Hada1, Tatsuya Inaba1, Katsumasa Iharari1, Goushi Kojima1, Tomonori Kondo1
1Auto-ID Laboratory / Keio University, Japan; 2Keio University, Japan; 3Toppan Printing Co., LTD, Japan

C3P-L1  SPECTROSCOPIC STUDY AND ANALYSIS OF THE IMPACT OF ALCOHOL INTAKE ON BIO-IMPEDANCE OF THE HUMAN BODY
Yasuhiro Omura, Kazuma Kojima
Kansai University, Japan

C3P-L3  SIZE OPTIMIZATION FOR HIGH FREQUENCY QUARTZ RESONATOR USING FINITE ELEMENT VIBRATION ANALYSIS
Jing Ji, Hiroshi Oigawa, Hsin Hui Chen, Meng Zhao, Toshisugu Ueda
Waseda University, Japan

C3P-L4  PARALLEL DATA PROCESSING FOR SPARSE DATA TOMOGRAPHY SENSORS
Jose Cantoral Ceballos, Kikior Ozanyan
University of Manchester, United Kingdom

C3P-L5  USE OF ELECTRO-MAGNETIC ANALYSIS TO MONITOR ACTIVITY OF A DIGITAL CIRCUIT IN A NON-INTRUSIVE WAY
Sebastien Thomas1, David Faurea, Guillaume Duc1, Jean-Luc Danger1, Didier Regis1, Marc Gatti4
(1)Telecom ParisTech, France; (2)Thales Avionics, France; (3)Thales Avionics & Institut Telecom / Télécom ParisTech, France; (4)Thales Systèmes Aéroportés, France

C3P-L6  THE MODELING OF THE ALIGNMENT SENSITIVITY OF A SAW STRAIN SENSOR TO APPLIED STRAIN
Brian Donohoe, Brian McCormack, Dermot Geraghty, Garrett O’Donnell
Trinity College Dublin, Ireland

C3P-L7  THEORETICAL MODELING OF THERMAL EXPANSION OF CRYSTALLINE SILICON BY USING THE STRAIN PHONON SPECTRA
Wei-Wei Zhang, Shuang-Ying Lei, Hong Yu, Qing-An Huang
Southeast University, China

C3P-L8  CHARACTERIZATION OF IRON OXIDE-GOLD CORE-SHELL MULTIFUNCTIONAL NANO partiCLES IN BIOMEDICAL IMAGING
Luca Menichetti2, Daniela Arosio2, Daniela Demarchi2, Luigi Paduano3, Alessandra Flori4, Francesco Conversano1, Sergio Casciaro2, Vincenzo Positano1, Leonardo Manzoni1
(1)CNR-Regione Toscano Fondazione G.Montanari, Italy; (2)National Research Council, IFC, Italy; (3)Research Council, ISTM, Italy; (4)Scuola Superiore Sant’Anna, Italy; (5)Università degli Studi di Napoli Federico II, Italy

C3P-L9  A METHODOLOGY FOR RELIABILITY PREDICTION: THERMAL AND RF MEMS CASE OF STUDIES
Mohamed Matmat, Hamza Boukabache, Antoine Marty, Daniel Esteve, Christophe Escriva, Jean-Yves Fourniols
Université de Toulouse, CNRS, LAAS, France

C3P-L10  SIMULATION OF A MEMS CORIOLIS GYROSCOPE WITH CLOSED-LOOP CONTROL FOR ARBITRARY INERTIAL FORCE, ANGULAR RATE, AND QUADRATURE INPUTS
Charles Tally, Richard Waters, Paul Swanson
SSC Pacific, United States

C3P-L11  ALLAN VARIANCE ANALYSIS ON MEMS TILT SENSORS WITH DIFFERENT PRINCIPLES OF OPERATION
Zdenek Havranek, Stanislav Klusacek, Petr Benes, Martin Vagner
Brno University of Technology, Czech Rep.

C3P-L12  CROSSFALL EFFECTS OF AVALANCHE CMOS PHOTODIODES
Meng-Lin Hsia, Zhe Ming Liu, Chieh Ning Chan, Oscal T.-C. Chen
National Chung Cheng University, Taiwan
**C3P-L13**  
APPLICATION OF A 2-D ANISOTROPIC ETCHING SIMULATOR ON PERFORATED ETCHING OF QUARTZ WAFER  
Meng Zhao, Hiroshi Oigawa, Jing Ji, Toshtisugu Ueda  
Waseda University, Japan

**C3P-L14**  
A NOVEL METHOD FOR EVALUATING TRIAXIAL STRAIN GAGES USED IN PRINTED CIRCUIT BOARD ASSEMBLIES (PCBA) STRAIN MONITORING  
Hongbin Shi, Satoshi Ikezawa, Toshtisugu Ueda  
Waseda University, Japan

**C3P-L15**  
A NOVEL VELOCITY SENSOR BASED ON ELECTROMAGNETIC INDUCTION  
Hajun Han¹, Yanjie Liu¹, Tao Liu², Yoshio Inoue², Kyoko Shibata²  
¹Harbin Institute of Technology, China; ²Kochi University of Technology, Japan

**C3P-L16**  
MULTI-SCALE MODELING TO STUDY MECHANISM OF BIOFOULING ELIMINATION IN A SURFACE ACOUSTIC WAVE BIOSENSOR  
Subramanian Sankaranarayanan¹, Reetu Singh¹, Venkat Bheethanabotla¹  
¹Argonne National Laboratory, United States; ²University of South Florida, United States

**C3P-L36**  
LUMINESCENT NANOPARTICLE-BASED INTRACELLULAR SENSING  
Barbara Korzeniowska, Anja Schulz, Dorota Wencel, Colette McDonagh  
Dublin City University, Ireland

**C3P-M1**  
AN EXTENSIBLE FRAMEWORK FOR THE MANAGEMENT OF REMOTE SENSOR DATA  
Michael McGrath, John Delaney  
Intel Ireland Ltd, Ireland

**C3P-M2**  
ADVANCED THERMAL SENSORS FOR PRECISION AC VOLTAGE METROLOGY  
Thomas Lipe, Joseph Kinard, Donald Novotny, June Sims  
National Institute of Standards and Technology, United States

**C3P-M3**  
EMBEDDED PATTERN RECOGNITION SYSTEMSFOR LIQUIDS CLASSIFICATION: A COMPARISON STUDY  
Luis Gil-Sánchez¹, Eduardo García-Breijo¹, José Garrigues¹, Nicolás Llaguarta¹, Rafael Masot¹, Javier Ibáñez¹, John Atkinson¹, Monika Gianc¹  
¹Universidad Politécnica de Valencia, Spain; ²University of Southampton, United Kingdom

**C3P-M4**  
DESIGN AND DEVELOPMENT OF MOBILE CARDIAC MARKER MONITORING SYSTEM FOR PREVENTION OF ACUTE CARDIOVASCULAR DISEASE  
Jiwhan Lee, Jaehyo Jung, Yoon Tae Kim  
Chosun University, Korea, South

**C3P-M5**  
OMNI-DIRECTIONAL RAIN SENSOR UTILIZING SCATTER RED LIGHT REFLECTION BY WATER PARTICLE ON AUTOMOTIVE WINDSHIELD GLASS  
Kyoo Nam Choi  
University of Incheon, Korea, South

**C3P-M6**  
FABRICATION OF BECU MODULE PROBE ARRAY USING HEATING AND FUSING CURRENTS  
Dongin Lee¹, Sangwon Kim¹, Daeyoung Kong², Chanseob Cho³, Bonghwan Kim³, Byeunguil Lee³, Jonghyun Lee³  
¹Catholic University of Daegu, Korea, South; ²Korea University of Technology and Education, Korea, South; ³Kyungpook National University, Korea, South

**C3P-M7**  
APPLICATION OF CONTINUOUS WAVELET TRANSFORMATION TO MONITOR DIABETIC NEUROPATHY AND VASOMOTION REACTION PATTERNS  
Jens Krall, Ulrich Timm, Hartmut Ewald  
Universität Rostock, Germany

**C3P-M8**  
IMPACT OF FUNCTIONAL CROSS-LINKER ON RECOGNITION PROPERTIES OF A BISPHENOL-A IMPRINTED POLYMER FILM FOR COATING A QUARTZ CRYSTAL MICROBALANCE  
Maria Concepcion Cela-Pérez, Jose Manuel López-Vilariño, María Victoria González-Rodríguez  
Universidad de Córdoba, Spain

**C3P-M9**  
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Jung Ho Kim, Dernot Diamond, King Tong Lau  
Dublin City University, Ireland

**C3P-M10**  
BIOMCOMPATIBLE POLYMERIC WIRELESS PRESSURE SENSOR FOR INTRAOCULAR PRESSURE SENSING APPLICATION  
Ning Xue¹, Jeong-Bong Lee², Steven Foland², Sung Pil Chang³  
¹Inha University, Korea, South; ²University of Texas at Dallas, United States

**C3P-M11**  
ACCURATE SENSOR FOR LAPI5 HYDROGEN STORAGE DEVICES  
Denis Marcotte, Frédéric Domingue  
Université du Québec à Trois-Rivières, Canada

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NON-INVASIVE LOW COST METHOD FOR LINEAR AND ANGULAR ACCELERATION MEASUREMENT IN BIPED LOCOMOTION MECHANISMS  
Viacheslav Khomenko¹, Olivier Bruneau², Fethi Ben Ouezdou³, Patrick Henaff¹, Artem Melnyk¹, Volodymyr Borysenko²  
¹Cergy-Pontoise University, France; ²Dnepot National Technical University, Ukraine; ³Versailles Saint Quentin-en-Yvelines University, France

**C3P-M13**  
A DIRECTIONAL GAMMA RAY DETECTOR USING A SINGLE CHIP COMPUTATIONAL SENSOR  
Nathan Scherm, Sina Balkir, Michael Hoffman, Mark Bauer  
University of Nebraska-Lincoln, United States

**C3P-M14**  
STUDY AND EVALUATION OF A SINGLE DIFFERENTIAL SENSOR DESIGN BASED ON ELECTRO-TEXTILE ELECTRODES FOR ECG BIOMETRICS APPLICATIONS  
Hugo Silva¹, André Lourenço², Renato Lourenço³, Paulo Leite⁴, David Coutinho³, Ana Fred³  
¹Instituto de Telecomunicações, Portugal; ²Instituto de Telecomunicações, DEETC, ISEL-IPL, Portugal; ³ISEL-IPL, CC, Portugal; ⁴ISEL-IPL, DEECT, Portugal

**C3P-M15**  
A MAGNETOSTRICTIVE/PIEZOELECTRIC LAMINATE TRANSDUCER BASED VIBRATION ENERGY HARVESTER WITH RESONANCE FREQUENCY TUNABILITY  
Ming Li, Yumei Wen, Ping Li, Jin Yang  
Chongqing University, China

**C3P-M16**  
A FEASIBILITY STUDY OF THE OPTOACOUSTIC IMAGING OF MICROCALCIFICATION FOR EARLY BREAST CANCER DETECTION  
Te-Chi Chiu¹, Tsai-Chau Hsiao¹, Shih-Bin Luo¹, Wanting Tien¹, Yao-You Cheng¹, Meng-Lin Li²  
¹Industrial Technology Research Institute, Taiwan; ²National Tsing Hua University, Taiwan
**APPLICATIONS**

**C3P-M28** MILLIMETER SIZE PATCH BEHAVIOR OF GECKO-INSPIRED REVERSIBLE ADHESIVE
John Tameller, Sathya Chary, Kimberly Turner, Jing Yu, Saurabh Das, Jacob Israelachvili
University of California, Santa Barbara, United States

**C3P-M29** SENSING MILLIMETER-SCALE DYNAMICS IN CORTICAL SURFACE POTENTIALS FOR NEURAL PROSTHETICS
Spencer Kellis, Bradley Greger, Sara Hannahan, Paul House, Richard Brown
University of Utah, United States

**C3P-M30** DEVELOPMENT OF PROBES FOR COCHLEAR IMPLANTS
Nishtar Lawand1, P. J. French1, Jeroen Briaire2, Johan Frjins2
(1)Delft University of Technology, Netherlands; (2)Leiden University Medical Center, Netherlands

**C3P-M31** A SAW PASSIVE WIRELESS SENSOR SYSTEM FOR MONITORING THE TEMPERATURE OF AN ELECTRIC CORD CONNECTOR AT LONG DISTANCE
Ping Li, Hua Xie, Yumei Wen, Chuan Wang, Shiyuan Huang, Zhiwei Ren, Junjie He, Dang Lu
Chongqing University, China

**C3P-M32** INERTIAL SENSOR ORIENTATION FOR CRICKET BOWLING MONITORING
Andrew Wixted1, Daniel James1, Marc Portus2
(1)Griffith University, Australia; (2)Praxis Sport Science Pty Ltd, Australia

**C3P-M33** OPTICAL MEASUREMENTS OF VIBRATION OF MEDIUM VOLTAGE TRANSFORMERS
Letizia De Maria, D. Bartalesi, G. Pirovano, P. Serragli
RSE Spa, Italy

**C3P-M34** A SELF-POWERED AC CURRENT SENSOR EMPLOYING MAGNETOSTRICTIVE PIEZOELECTRIC CYLINDRICAL COMPOSITE
Jitao Zhang, Ping Li, Yumei Wen, Aichao Yang
Chongqing University, China

**C3P-M35** SELECTIVE GROWTH OF MWCNT ON PATTERNED TUNGSTEN AT ROOM TEMPERATURE USING OXYGEN PLASMA AND PHOTO-RESIST
Faisal Chowdhury, Karumbaih Chappanda, Massood Tabib-Azar
University of Utah, United States

**C3P-M36** FRAME BY FRAME WAVELET DECOMPOSITION OF ELECTRICAL CAPACITANCE VALUES FOR REAL TIME TOMOMETRIC APPLICATIONS
Ru Yan1, Saba Mylvaganam2
(1)Telemark University College, Norway; (2)Telemark University College & Telemark Technological R&D Institute, Norway

**C3P-M37** A LOW-POWER 12-BIT CAPACITANCE-TO-DIGITAL CONVERTER FOR CAPACITIVE MEMS PRESSURE SENSOR
Sagnik Kar, Walter Leon-Salas
University of Missouri-Kansas City, United States

**C3P-M38** INTEGRATED MICROSYSTEM WITH HUMIDITY, TEMPERATURE AND LIGHT SENSORS FOR MONITORING THE PRESERVATION CONDITIONS OF FOOD
Davide Cartasegna1, Fabrizio Conso1, Achille Donida1, Davide Mandelli1, Marco Grassi1, Luca Piccoli1, Gabriele Rescio1, Piero Malcovati1, Giuseppe Perretti1, Gian Franco Regnicoli2
(1)Università degli Studi di Pavia, Italy; (2)Università degli Studi di Perugia, Italy

**C3P-M39** A SELF-POWERED HIGH SENSITIVE SENSOR FOR AC ELECTRIC CURRENT
Wei He, Ping Li, Yumei Wen, Caijiang Lu
Chongqing University, China

**C3P-M40** A 3V SINGLE SUPPLY LIA FOR PORTABLE SENSING SYSTEMS
Javier Aguirre, Nicolás Medrano, Belén Calvo, Santiago Celma
Universidad de Zaragoza, Spain
C3P-M41  A FREQUENCY DOMAIN BURST DETECTION TECHNIQUE FOR WATER DISTRIBUTION SYSTEMS  
Thaw Tar Thein Zan1, Kai-Juan Wong1, Hock Beng Lim2, Andrew J. Whittle1  
(1) Massachusetts Institute of Technology, United States; (2) Nanyang Technological University, Singapore

C3P-M42  NEGATIVE-DIELECTROPHORESIS SEPARATION MODULES BASED HIGH THROUGHPUT AND HIGH EFFICIENT CELL SORTING PLATFORM FOR LEUKEMIA CELL  
Junghun Lee1, Youngwoong Kim1, Minchurl Kim1, Byungkyu Kim1, Ji Yoon Kang2  
(1) Korea Aerospace University, Korea, South; (2) Korea Institute of Science and Technology, Korea, South

C3P-M43  A PORTABLE SENSING SYSTEM FOR WATER QUALITY MONITORING  
Karen Twomey1, Meyrick Stephens1, Greg Jasionek2, Dimitri Papkovsky2, Vladimir Ogurtsov1  
(1) Tyndall National Institute, Ireland; (2) University College Cork, Ireland

C3P-M44  BENEFITS OF A HYPERSPECTRAL MICROWAVE SENSOR  
Sid Ahmed Boukabara1, Kevin Garrett1  
(1) IMSG Inc., United States; (2) NOAA/NESDIS, United States

C3P-M45  TIME DELAY ESTIMATION FOR ACOUSTIC SOURCE LOCATION BY MEANS OF SHORT-TIME CROSS-CORRELATION  
Alain Le Duff1, Seif Eddine Hamdi2, Guy Plantier1, Bertrand Lascoup2  
(1) ESEO, France; (2) ESTACA, France

C3P-M46  SENSOR ARRAY FOR PV SHADING MEASURMENTS  
Carlos Barreiro, Ari Bross, John Schmalzel, Peter Jansson  
Rowan University, United States

C3P-M47  EMBEDDED PROCESS FOR FLEXIBLE CONDUCTIVE ELECTRODES FOR APPLICATIONS IN TISSUE ELECTRICAL IMPEDANCE SCANNING (EIS)  
Daehan Chung1, Ajit Khosla2, Sam Seyfollahi3, Bonnie Gray1, Ash Parameswaran2, Ramani Ramaseshan1, Kirpal Kohli2  
(1) BC Cancer Agency-Abbotsford Centre, Canada; (2) Fraser Valley Cancer Centre, Canada; (3) Simon Fraser University, Canada

C3P-M49  PRECISION NAVIGATION SENSORS FACILITATE FULL AUTO PILOT CONTROL OF SMART ROV FOR OCEAN ENERGY APPLICATIONS  
Daniel Toal, Edin Omerdic, Gerard Dooly  
University of Limerick, Ireland

C3P-M50  MULTI-CYCLE 0.35-UM CMOS INTEGRATED ELECTRONIC INTERFACE CIRCUIT FOR ENERGY HARVESTING SYSTEMS  
Enrico Dallago, Alberto Danioni, Marco Grassi, Piero Malcovati, Marco Marchesi, Giuseppe Venchi  
University of Pavia, Italy

C3P-M51  A METHOD OF MOTHER WAVELET FUNCTION LEARNING FOR DWT-BASED ANALYSIS USING EEG SIGNALS  
Won-Seok Kang, Kookrae Cho, Seung-Hyun Lee  
Daegu Gyeongbuk Institute of Science & Technology, Korea, South

C3P-M52  AN INVESTIGATION ON THE RESPONSIVITY AND NOISE OF A WIRE-BONDED CMOS MICRO-FLUXGATE SENSOR  
Won-Seok Kang, Yu-Ting Liu  
Taiwan
HIGH-PERFORMANCE MULTICAPILLARY GAS SEPARATION COLUMNS WITH MPG STATIONARY PHASES
Hamza Shakeel, Masoud Agah
Virginia Polytechnic Institute and State University, United States

ONLINE MEASUREMENT OF CORNEA DEFORMATION DURING NON-CONTACT TONOMETRY
Tim Krijger1, Makoto Kaneko2
{1}Delft University of Technology, Netherlands; {2}Osaka University, Graduate School of Engineering, Japan

DNA HYBRIDIZATION DETECTION BASED ON AN ORGANIC CHARGE MODULATED FIELD EFFECT TRANSISTOR
Monia Demelas, Stefano Lai, Massimo Barbaro, Annalisa Bonfiglio
University of Cagliari, Italy

STEERING WHEEL PHOTONIC CRYSTAL FIBER FOR MONOCLONAL ANTIBODY DETECTION
Rosalind Wynne, Emily Battinelli, Francis Anuszewski, Mark Reimlinger, William Kelly
Villanova University, United States

UNCONSTRAINED PULSE PRESSURE SENSING FOR HEALTH MANAGEMENT BASED ON A HETERO-CORE FIBER OPTIC SENSOR
Michiko Nishiyama1, Kazuhiro Watanabe2
(1)Japan Aerospace Exploration Agency, Japan; (2)Soka University, Japan

SENSING MECHANISM IN RECEPTOR-MODIFIED ORGANIC FIELD EFFECT TRANSISTOR BASED VAPOR SENSORS
Davianne Duarte1, Bradley Holliday2, Ananth Dodabalapur1
(1)Microelectronics Research Center, The University of Texas at Austin, United States; (2)The University of Texas at Austin, United States

15:45
C4L-A1
HIGH-PERFORMANCE MULTICAPILLARY GAS SEPARATION COLUMNS WITH MPG STATIONARY PHASES
Hamza Shakeel, Masoud Agah
Virginia Polytechnic Institute and State University, United States

C4L-B1
A SECOND GENERATION 3D INTEGRATED FEATURE-EXTRACTING IMAGE SENSOR
Xiangyu Zhang1, Shoushun Chen1, Eugenio Culurciello2
(1)Nanyang Technological University, Singapore; (2)Yale University, United States

C4L-C1
AN 8-12GHZ CAPACITIVE POWER SENSOR BASED ON MEMS CANTILEVER BEAM
Zhenxiang Yi1, Xiao Ping Liao2, Zheng Zhu3
(1)Key Laboratory of MEMS of Ministry of Education, Southeast University, China; (2)Southeast University, China

16:00
C4L-A2
ONLINE MEASUREMENT OF CORNEA DEFORMATION DURING NON-CONTACT TONOMETRY
Tim Krijger1, Makoto Kaneko2
(1)Delft University of Technology, Netherlands; (2)Osaka University, Graduate School of Engineering, Japan

C4L-B2
INTEGRATED FILTER-LESS BICMOS SENSOR FOR RGB-LED COLOR DETERMINATION
Andreas Polzer, Wolfgang Gaberl, Milos Davidovic, Horst Zimmermann
Vienna University of Technology, Austria

C4L-C2
CAPACITIVELY COUPLED ATMOSPHERIC RF MICROPLASMA DEVICES
Wen Yuan, Massood Tabib-Azar
University of Utah, United States

16:15
C4L-A3
DNA HYBRIDIZATION DETECTION BASED ON AN ORGANIC CHARGE MODULATED FIELD EFFECT TRANSISTOR
Monia Demelas, Stefano Lai, Massimo Barbaro, Annalisa Bonfiglio
University of Cagliari, Italy

C4L-B3
A TWO-STEP READOUT CMOS IMAGE SENSOR ACTIVE PIXEL ARCHITECTURE
Tsung-Hsuen Tsai, Richard Hornsey
VISOR Lab, York University, Canada

C4L-C3
CAPACITIVE LEVEL SENSOR FOR LAYERED FILLINGS IN TANKS AND VESSELS BASED ON METAMATERIAL TRANSMISSION LINE
Martin Schüßler, Margarita Puentes, Christian Mandel, Rolf Jakoby
Technische Universität Darmstadt, Germany

16:30
C4L-A4
STEERING WHEEL PHOTONIC CRYSTAL FIBER FOR MONOCLONAL ANTIBODY DETECTION
Rosalind Wynne, Emily Battinelli, Francis Anuszewski, Mark Reimlinger, William Kelly
Villanova University, United States

C4L-B4
OPTICAL SPECTROSCOPY AND PATTERN RECOGNITION TECHNIQUES FOR DISCRIMINATING AND CLASSIFYING SCOTCH WHISKIES
Anna Grazia Mignani1, Leonardo Ciacci1, A.A. Mencaglia1, Belén Gordillo2, Maria Lourdes Gonzalez-Miret2, Francisco Jose Heredia2, Brian Culshaw1
(1)National Research Council, IFAC, Italy; (2)Universidad de Sevilla, Spain; (3)University of Strathclyde, United Kingdom

C4L-C4
AN EFFICIENT METHOD FOR MODELING PLANAR INTERDIGITATED ELECTRODES FOR CAPACITIVE SENSING
Stefan Schaur, Bernhard Jakoby
Johannes Kepler Universität, Austria

16:45
C4L-A5
UNCONSTRAINED PULSE PRESSURE SENSING FOR HEALTH MANAGEMENT BASED ON A HETERO-CORE FIBER OPTIC SENSOR
Michiko Nishiyama1, Kazuhiro Watanabe2
(1)Japan Aerospace Exploration Agency, Japan; (2)Soka University, Japan

C4L-B5
NOVEL SENSOR CELL DESIGN AND ALGORITHM TO ONLINE REALIZE STABLE AND COST EFFECTIVE OPTICAL CONCENTRATION MEASUREMENTS AT FLUCTUATING LIGHT SOURCE SITUATIONS
Martin Degner2, Hartmut Ewald2, Elfed Lewis1
(1)University of Limerick, Ireland; (2)Universität Rostock, Germany

C4L-C5
A SYSTEM LEVEL MODELING FOR DISTRIBUTED RF MEMS DEVICES CONSIDERING THERMALLY INDUCED PACKAGING EFFECT
Cheng Zhao, Jing Song, Qing-An Huang
Southeast University, China

17:00
C4L-A6
SENSING MECHANISM IN RECEPTOR-MODIFIED ORGANIC FIELD EFFECT TRANSISTOR BASED VAPOR SENSORS
Davianne Duarte1, Bradley Holliday2, Ananth Dodabalapur1
(1)Microelectronics Research Center, The University of Texas at Austin, United States; (2)The University of Texas at Austin, United States

C4L-B6
ALL ALD TI02-AL2O3-TI02 HORIZONTAL SLOT WAVEGUIDES FOR OPTICAL SENSING
A. Purniawan, P. J. French, Gregory Pandraug, Yujian Huang, P. M. Sarro
Delft University of Technology, Netherlands

C4L-C6
A SURFACE-MICROMACHINED MEMS ACOUSTIC SENSOR WITH BACK-PLATE ANCHORS OF 100 MM DEPTH
Cheng Zhao, Jing Song, Qing-An Huang
Southeast University, China
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<td>Chairs: Olga Conde, Universidad de Cantabria, Andrea Cusano, Università degli Studi del Sannio</td>
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<td>Bell Labs Ireland, Alcatel-Lucent, Ireland</td>
<td>(1)École Polytechnique Fédérale de Lausanne, Switzerland; (2)Key Laboratory of MEMS of Ministry of Education, Southeast University, China; (3)Southeast University, China</td>
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<td>Sonn Perricone1, Andrew Miller-Brodl2, Albert Domeiche1, Markus Fritton2, Josef B chler3, Thomas Holzschuh4</td>
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<td>University of California, Berkeley, United States</td>
<td>(1)Fraunhofer Institute for Applied Solid State Physics, Germany; (2)Fraunhofer Institute for High Frequency Physics and Radar Techniques, Germany</td>
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<td>Conférence Adjourns</td>
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