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## MONDAY, NOVEMBER 3RD

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**8:40 – 9:00**  
**OPENING REMARKS AND TECHNICAL ACHIEVEMENT AWARD**  
**Auditorium 1**

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**9:00 - 9:50**  
**KEYNOTE – CARLO RATTI**  
**Auditorium 1**  
**Session Chair: Càndid Reig (University of Valencia, Spain)**

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**THE SENSEABLE CITY**  
Carlo Ratti  
*MIT Senseable City Lab and Carlo Ratti Association, USA*

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**10:00 - 11:30**  
**A1L-A: SPECIAL SESSION: SMART CITIES SENSORS**  
**Auditorium 1**  
**Session Chair: Michele Penza (ENEA, Italy)**

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*ENEA, Italy*

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<sup>1</sup>*Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy;* <sup>2</sup>*Università degli Studi di Napoli Federico II, Italy*

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<sup>1</sup>*Aoyama Gakuin University, Japan;* <sup>2</sup>*Mie University, Japan*

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<sup>1</sup>Consejo Superior de Investigaciones Cientificas, Spain; <sup>2</sup>ENEA, Italy; <sup>3</sup>Joint Research Center, Italy; <sup>4</sup>Phoenix Sistemi & Automazione s.a.g.l., Switzerland

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10:00 - 11:30

**A1L-B: OPTICAL FIBER SENSORS I**

**Auditorium 2**

**Session Chairs: Elfed Lewis (University of Limerick, Ireland), Jesus M. Corres (Public University of Navarra, Spain)**

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<sup>1</sup>Cyprus University of Technology, Cyprus; <sup>2</sup>University of Limerick, Ireland

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<sup>1</sup>Universidad de Zaragoza, Spain; <sup>2</sup>Universidad Nacional Experimental Politécnica Antonio José de Sucre, Venezuela; <sup>3</sup>Univestitat Autònoma de Barcelona, Spain

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<sup>1</sup>IRCCS Policlinico San Matteo Foundation, Italy; <sup>2</sup>Politecnico di Milano, Italy; <sup>3</sup>Università degli studi di Pavia, Italy; <sup>4</sup>University of Limerick, Ireland

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Session Chairs: Eduard Llobet (Universitat Rovira i Virgili, Spain), Massood Atashbar (Western Michigan University, USA)

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<sup>1</sup>*Rensselaer Polytechnic Institute, USA;* <sup>2</sup>*University of California, Riverside, USA*

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Session Chair: Andrea de Marcellis (Università degli Studi dell'Aquila, Italy)

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<sup>1</sup>*Brookman Technology, Inc., Japan;* <sup>2</sup>*NHK Engineering System, Inc., Shizuoka University, Japan;* <sup>3</sup>*Nippon Hoso Kyokai, Japan;* <sup>4</sup>*Shizuoka University, Japan*

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<sup>1</sup>Samsung Electronics, USA; <sup>2</sup>University of Cambridge, United Kingdom

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<sup>1</sup>Institut d'Electronique Fondamentale, France; <sup>2</sup>Université du Maine, France; <sup>3</sup>Université Paris Sud, France; <sup>4</sup>University of Michigan, France

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<sup>1</sup>*Rensselaer Polytechnic Institute, USA;* <sup>2</sup>*Universitat de Barcelona, Spain;* <sup>3</sup>*Vilnius University, Lithuania*

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**10:00 - 11:30**  
**A1L-F: AGRICULTURE & WATER**  
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**Session Chairs: Aggelos Bletsas (Technical University of Crete, Greece), Daniele Trincheri (Politecnico di Torino, Italy)**

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**A2L-A: SPECIAL SESSION: DISTRIBUTED FIBER-OPTIC SENSORS USING BRILLOUIN SCATTERING**

Auditorium 1

Session Chairs: Avi Zadok (Bar-Ilan University, Israel), Alayn Loayssa (Public University of Navarra, Spain)

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<sup>1</sup>Consejo Superior de Investigaciones Científicas, Spain; <sup>2</sup>Universidad de Alcalá, Spain

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<sup>1</sup>*Samsung Electronics, South Korea*; <sup>2</sup>*University of Cambridge, United Kingdom*

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<sup>1</sup>APIX Technology, France; <sup>2</sup>Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France

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12:00 - 13:30

**A2L-D: DEVICES AND INTERFACES**

**Auditorium 3B**

**Session Chair: Diana Leitao (INESC Microsistemas e Nanotecnologias & IN and Instituto Superior Tecnico, Portugal)**

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<sup>1</sup>Chung-Shan Institute of Science & Technology, Taiwan; <sup>2</sup>National Chiao Tung University, Taiwan

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<sup>1</sup>Broadcom Corporation, Netherlands; <sup>2</sup>Holst Centre/IMEC, Netherlands; <sup>3</sup>Technische Universiteit Delft, Netherlands

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<sup>1</sup>National Chiao Tung University, Taiwan; <sup>2</sup>Sitronix Technology Corp., Taiwan

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<sup>1</sup>Keio University, Japan; <sup>2</sup>Yaguchi Denshi Corp., Japan

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12:00 - 13:30

**A2L-E: FLUIDIC SENSORS**

Rooms 1 & 2

Session Chairs: Istvan Barsony (University of Pannonia), Gary O'Brien (Robert Bosch LLC, United States)

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<sup>1</sup>Forschungszentrum Jülich, Germany; <sup>2</sup>Universität Bonn, Germany

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<sup>1</sup>National Institute of Advanced Industrial Science and Technology, Japan; <sup>2</sup>Vietnam National University, Hanoi, Vietnam

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<sup>1</sup>Technische Universität Wien, Austria; <sup>2</sup>Universidad de Castilla-La Mancha, Spain

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<sup>1</sup>Donau-Universität Krems / Johannes Kepler Universität Linz, Austria; <sup>2</sup>Johannes Kepler Universität Linz, Austria

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<sup>1</sup>Donau-Universität Krems / Johannes Kepler Universität Linz, Austria; <sup>2</sup>Johannes Kepler Universität Linz, Austria;

<sup>3</sup>Université Bordeaux 1, France

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<sup>1</sup>Hiroshima City University, Japan; <sup>2</sup>Nagoya University, Japan

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12:00 - 13:15

**A2L-F: ENABLING TECHNOLOGIES**

Rooms 3 & 4

Session Chairs: Georgios Papadopoulos (University of Strasbourg, France), Dennis Laurijssen (Universiteit Antwerpen, Belgium)

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<sup>1</sup>Hellenic Open University, Greece; <sup>2</sup>Université de Strasbourg, France

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## MONDAY, NOVEMBER 3RD – POSTER SESSION

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**15:00 - 16:20**

**A3P-H: METAL OXIDES AND CARBON NANOMATERIALS FOR GAS SENSING**

Poster Area - Foyer

Session Chair: Roman Beigelbeck (Danube University Krems, Austria)

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<sup>1</sup>Council for Scientific and Industrial Research, South Africa; <sup>2</sup>Universität zu Köln, Germany; <sup>3</sup>University of Pretoria, South Africa

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<sup>1</sup>Technische Universität Dortmund, Germany; <sup>2</sup>Università del Salento, Italy

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**15:00 - 16:20**

**A3P-J: MECHANICAL AND PHOTONIC BIOSENSORS**

Poster Area - Foyer

Session Chairs: Anna G. Mignani (CNR-Institute of Applied Physics 'Nello Carrara', Italy)

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<sup>1</sup>Kyoto Institute of Technology, Japan; <sup>2</sup>Kyoto Institute of Technology, Japan; <sup>3</sup>Niigata University, Japan

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<sup>1</sup>Bhabha Atomic Research Center, India; <sup>2</sup>Conservatoire National des Arts et Métiers, France; <sup>3</sup>Université Ferhat Abbas, Algeria; <sup>4</sup>Université Paris Diderot, France

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**15:00 - 16:20**

**A3P-K: OPTICAL SENSORS I**

**Poster Area - Foyer**

**Session Chairs: Jesus M. Corres (Public University of Navarra, Spain), Carlos Ruiz Zamarreño (Public University of Navarra, Spain)**

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<sup>1</sup>*Institut des Molécules et Matériaux du Mans, France;* <sup>2</sup>*Institut d'Electronique, de Microélectronique et de Nanotechnologie, France;* <sup>3</sup>*Laboratoire de Physique et Chimie Quantique, Algeria;* <sup>4</sup>*Otto-von-Guericke-Universität Magdeburg, Germany;* <sup>5</sup>*Université des Sciences et Technologies de Lille, France*

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15:00 - 16:20

**A3P-L: MECHANICAL AND PHYSICAL SENSORS I**

Poster Area - Foyer

Session Chair: Siavash Pourkamali (University of Texas at Dallas)

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<sup>1</sup>Massachusetts Institute of Technology, United States; <sup>2</sup>Nanyang Technological University, Singapore;

<sup>3</sup>Singapore-MIT Alliance for Research and Technology, Singapore

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**15:00 - 16:20**

**A3P-M: ACTUATION**

**Poster Area - Foyer**

**Session Chairs: Oliver Paul (University of Freiburg, Germany), Gijs Krijnen (University of Twente, Netherlands)**

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**A NOVEL GEOMETRY FOR A CORONA WIND ELECTROHYDRODYNAMIC PUMP ..... B#5**

Olutosin Fawole, Massood Tabib-Azar

University of Utah, United States

**POLYMERIC MULTI-POINT PRESSURE SENSOR AND PLASMA ACTUATOR COUPLED SYSTEM FOR AIRCRAFT ACTIVE FLOW SEPARATION CONTROL ..... B#5**

Luca Francioso, Chiara De Pascali, Giovanni Montagna, Pietro Siciliano

Consiglio Nazionale delle Ricerche, Italy

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<sup>1</sup>Massachusetts Institute of Technology, United States; <sup>2</sup>Nanyang Technological University, Singapore;

<sup>3</sup>Singapore-MIT Alliance for Research and Technology, Singapore

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**15:00 - 16:20**

**A3P-N: SENSOR NETWORKS I**

**Poster Area - Foyer**

**Session Chairs: Konstantin Mikhaylov (University of Oulu, Finland), Spyridon Daskalakis (Technical University of Crete, Greece)**

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**15:00 - 16:20**

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**Poster Area - Foyer**

**Session Chairs: Giuseppe Barillaro (University of Pisa, Italy), Olga Conde (University of Cantabria, Spain)**

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<sup>1</sup>NanoLambda, Inc., South Korea; <sup>2</sup>National Taipei University of Technology, Taiwan

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<sup>1</sup>HIPSITEC, S.A, Spain; <sup>2</sup>Universidad de Oviedo, Spain

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**Poster Area - Foyer**

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*<sup>1</sup>Dresden University of Technology, Germany; <sup>2</sup>Infineon Technologies Dresden GmbH, Germany; <sup>3</sup>Infineon Technologies Dresden GmbH / Technische Universität Dresden, Germany*

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*<sup>1</sup>German Aerospace Center, Germany; <sup>2</sup>Technische Universität Braunschweig, Germany*

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**A3P-R: PHENOMENA, MODELING AND EVALUATION**

**Poster Area - Foyer**

**Session Chairs: Srinivas Tadigadapa (The Pennsylvania State University, United States), Bernhard Jakoby (Johannes Kepler University Linz, Austria)**

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*<sup>1</sup>Chevron Energy Technology Co., United States; <sup>2</sup>Marquette University, United States; <sup>3</sup>Stanford University, United States*

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*<sup>1</sup>Chinese Academy of Sciences, China; <sup>2</sup>Peking University, China*

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<sup>3</sup>*Université Bordeaux 1, France*

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<sup>1</sup>*Cambridge CMOS Sensors Ltd, United Kingdom;* <sup>2</sup>*University of Cambridge, United Kingdom*

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**16:30 - 18:15**

**A4L-A: SPECIAL SESSION: TIME OF FLIGHT IMAGING, SENSORS & ALGORITHMS**

**Auditorium 1**

**Session Chairs: Erez Tadmor (Microsoft, Israel), Micha Feigin (Massachusetts Institute of Technology, United States)**

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**16:30**

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<sup>1</sup>*Massachusetts Institute of Technology, United States;* <sup>2</sup>*Microsoft R&D, United States*

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<sup>1</sup>*Fondazione Bruno Kessler, Italy;* <sup>2</sup>*Università degli Studi di Trento, Italy*

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Session Chairs: Anna G. Mignani (CNR-Institute of Applied Physics 'Nello Carrara', Italy), Olga Conde (University of Cantabria, Spain)

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<sup>1</sup>Infineon Technologies Austria AG, Austria; <sup>2</sup>Johannes Kepler Universität Linz, Austria; <sup>3</sup>Technische Universität Wien, Austria; <sup>4</sup>University of Oxford, United Kingdom

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<sup>1</sup>Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France; <sup>2</sup>III-V Lab, France

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Auditorium 3A

Session Chair: Eduard Llobet (Universitat Rovira i Virgili, Spain)

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**A4L-D: MEDICAL APPLICATIONS II**

**Auditorium 3B**

**Session Chairs: Alper Bozkurt (North Carolina State University, United States), Jurgen Kosel (King Abdullah University of Science and Technology, Saudi Arabia)**

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<sup>1</sup>*Università Campus Bio-Medico, Italy;* <sup>2</sup>*Università Campus Bio-Medico di Roma, Italy;* <sup>3</sup>*Università Cattolica del Sacro Cuore, Italy;* <sup>4</sup>*Università degli Studi di Roma Tor Vergata, Italy;* <sup>5</sup>*University of Amsterdam, Netherlands*

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<b>17:30</b>	<b>MAGNETO-TRANSPORT BEHAVIOR OF DOUBLE EXCHANGE MAGNETIC TUNNEL JUNCTION SENSORS.....</b>	<b>718</b>
	Ana V. Silva <sup>2</sup> , Diana C. Leitao <sup>2</sup> , Elvira Paz <sup>3</sup> , Zhiwei Hou <sup>1</sup> , Ricardo Ferreira <sup>3</sup> , Susana Cardoso <sup>2</sup> , Paulo P. Freitas <sup>1</sup> <sup>1</sup> <i>INESC Microsistemas e Nanotecnologias, Portugal;</i> <sup>2</sup> <i>INESC Microsistemas e Nanotecnologias &amp; IN and Instituto Superior Tecnico, Portugal;</i> <sup>3</sup> <i>International Iberian Nanotechnology Laboratory, Portugal</i>	



**17:45**  
**FIBER OPTIC MAGNETOMETER WITH SUB-PICO TESLA SENSITIVITY FOR MAGNETO-ENCEPHALOGRAPHY .....722**  
 Pradeep Pai<sup>2</sup>, Lingyao Chen<sup>1</sup>, Massood Tabib-Azar<sup>2</sup>  
<sup>1</sup>*Inven Sense, United States*; <sup>2</sup>*University of Utah, United States*

**16:30 - 18:00**  
**A4L-F: LOW POWER SOLUTIONS**  
**Rooms 3 & 4**  
**Session Chairs: Francisco Alvarez (Arquimea Ingeniería S.L.U., Spain), Francesco Giuseppe Della Corte (Università degli Studi Mediterranea di Reggio Calabria, Italy)**

**16:30**  
**NEW APPROACHES IN LOW POWER AND MASS PAYLOAD FOR WIRELESS SENSOR NETWORKS (WSNS) FOR LUNAR SURFACE EXPLORATION .....726**  
 Francisco Álvarez<sup>1</sup>, David Millen<sup>1</sup>, Cayetano Rivera<sup>1</sup>, Carlos Benito<sup>1</sup>, Jesus Lopez<sup>1</sup>, Diego Fernández<sup>1</sup>, Luis Moreno<sup>2</sup>  
<sup>1</sup>*Arquimea Ingeniería S.L.U, Spain*; <sup>2</sup>*Universidad Carlos III de Madrid, Spain*

**16:45**  
**REMOTE IMAGE CAPTURING WITH LOW-COST AND LOW-POWER WIRELESS CAMERA NODES .....730**  
 Sebastian Bader, Matthias Krämer, Najeem Lawal, Mattias O'Nils, Bengt Oelmann  
*Mid Sweden University, Sweden*

**17:00**  
**A CARD SIZE ENERGY HARVESTING ELECTRIC POWER SENSOR FOR IMPLEMENTING EXISTING ELECTRIC APPLIANCES INTO HEMS .....734**  
 Yuki Tsunoda<sup>3</sup>, Chikara Tsuchiya<sup>2</sup>, Yuji Segawa<sup>2</sup>, Hajime Sawaya<sup>1</sup>, Minoru Hasegawa<sup>1</sup>, Koichiro Ishibashi<sup>3</sup>  
<sup>1</sup>*REVSONIC Corporation, Japan*; <sup>2</sup>*TM Link Co.,Ltd., Japan*; <sup>3</sup>*University of Electro-Communications, Japan*

**17:15**  
**PERFORMANCE ASSESSMENT OF AN ENHANCED RFID SENSOR TAG FOR LONG-RUN SENSING APPLICATIONS .....738**  
 Massimo Merenda, Ivan Farris, Corrado Felini, Leonardo Militano, Silverio Carlo Spinella, Francesco Giuseppe Della Corte, Antonio Iera  
*Università degli Studi Mediterranea di Reggio Calabria, Italy*

**17:30**  
**THIN FILM BASED FLEXIBLE CURRENT CLAMP SENSOR FOR GREEN WIRELESS SENSOR NETWORKS .....742**  
 Takahiro Yamashita, Yi Zhang, Hironao Okada, Toshihiro Itoh, Ryutaro Maeda  
*National Institute of Advanced Industrial Science and Technology, Japan*

**17:45**  
**WDM SENSOR NETWORK APPROACH: BRIDGING THE GAP TOWARDS POF-BASED PHOTONIC SENSING .....746**  
 Alberto Tapetado<sup>2</sup>, David Sánchez Montero<sup>2</sup>, Carmen García Vázquez<sup>2</sup>, David J. Webb<sup>1</sup>  
<sup>1</sup>*Aston University, United Kingdom*; <sup>2</sup>*Universidad Carlos III de Madrid, Spain*

## TUESDAY, NOVEMBER 4TH

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9:00 - 9:50

**KEYNOTE – HERRE VAN DER ZANT**

Auditorium 1

Session Chair: Lina Sarro (TUDelft, The Netherlands)

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**GRAPHENE SENSORS IN THE EUROPEAN GRAPHENE FLAGSHIP**

Herre van der Zant

*Kavli Institute of Nanoscience, Delft University of Technology, The Netherlands*

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9:40 - 9:50

**Early Career Award**

Auditorium 1

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10:00 - 11:45

**B1L-A: SPECIAL SESSION: LASER SELF-MIXING SENSORS**

Auditorium 1

Session Chairs: Thierry Bosch (Tsinghua Laboratory of Analysis and Architecture of Systems- CNRS, France),  
Santiago Royo (Universitat Politècnica de Catalunya, Spain)

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10:00

**INVITED TALK: PLENOPTIC MICROSCOPE BASED ON LASER OPTICAL**

**FEEDBACK IMAGING (LOFI) .....750**

Wilfried Glastre, Olivier Hugon, Olivier Jacquin, Hugues Guillet de Chatellus, Eric Lacot

*Université Joseph Fourier, France*

10:30

**CARRIERS DENSITY IMAGING BY SELF-MIXING INTERFEROMETRY IN A THZ QUANTUM**

**CASCADE LASER .....754**

Lorenzo Luigi Columbo<sup>2</sup>, Francesco Paolo Mezzapesa<sup>2</sup>, Maurizio Dabbicco<sup>2</sup>, Massimo Brambilla<sup>2</sup>,  
Gaetano Scamarcio<sup>2</sup>, Miriam Serena Vitiello<sup>1</sup>

<sup>1</sup>*Istituto Nanoscienze and Scuola Normale Superiore, Italy;* <sup>2</sup>*Università degli Studi di Bari Aldo Moro, Italy*

10:45

**MEASUREMENT OF RELATIVE VELOCITY OF INDEPENDENT TARGETS BY A QUANTUM**

**CASCADE LASER SUBJECT TO OPTICAL FEEDBACK .....758**

Francesco Paolo Mezzapesa, Lorenzo Luigi Columbo, Massimo Brambilla, Maurizio Dabbicco,  
Vincenzo Spagnolo, Gaetano Scamarcio

*Università degli Studi di Bari Aldo Moro, Italy*

11:00

**ANALYTIC PHASE RETRIEVAL OF DYNAMIC OPTICAL FEEDBACK SIGNALS**

**FOR LASER VIBROMETRY .....762**

Antonio Luna Arriaga, Francis Bony, Thierry Bosch

*LAAS / CNRS / Université de Toulouse, France*

**11:15**  
**TOWARDS ATOMIC FORCE MICROSCOPY MEASUREMENTS USING DIFFERENTIAL SELF-MIXING INTERFEROMETRY** .....766  
Francisco Javier Azcona, Santiago Royo, Ajit Jha  
*Universitat Politècnica de Catalunya, Spain*

**11:30**  
**ULTIMATE ERROR SOURCES IN SELF-MIXING INTERFEROMETRY** .....771  
Giuseppe Martini<sup>2</sup>, Silvano Donati<sup>2</sup>, Tiziana Tambosso<sup>1</sup>  
<sup>1</sup>Dayeh University, Taiwan; <sup>2</sup>Università degli Studi di Pavia, Italy

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**10:00 - 11:15**  
**B1L-B: SENSORS & SENSING SYSTEMS I**  
**Auditorium 2**  
**Session Chairs: Libor Rufer (TIMA IMAG, France), Oliver Paul (University of Freiburg, Germany)**

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**10:00**  
**MICROFLUIDIC-BASED REAL-TIME DETECTOR FOR FINE PARTICULATE MATTER** .....775  
Leon Yuen<sup>2</sup>, Winnie Chu<sup>1</sup>, Boris Stoeber<sup>2</sup>  
<sup>1</sup>Nanozen Inc., Canada; <sup>2</sup>University of British Columbia, Canada

**10:15**  
**A NOVEL SMART PRODDER WITH SENSOR FEEDBACK FOR MATERIAL RECOGNITION IN HUMANITARIAN DEMINING APPLICATIONS** .....779  
Salvatore Baglio, Luciano Cantelli, Fabio Giusa, Giovanni Antonio Muscato, Alessio Noto  
*Università degli Studi di Catania, Italy*

**10:30**  
**THE DEVELOPMENT OF MAGNETIC POWDERY SENSOR**.....783  
Shunsuke Nagahama<sup>2</sup>, Yosuke Kimura<sup>2</sup>, Chyon.Hae Kim<sup>1</sup>, Shigeki Sugano<sup>2</sup>  
<sup>1</sup>Iwate University, Japan; <sup>2</sup>Waseda University, Japan

**10:45**  
**DUAL TOUCH AND GESTURE RECOGNITION IN 4-WIRE RESISTIVE TOUCHSCREENS** .....787  
Javier Calpe-Maravilla<sup>1</sup>, Italo Medina<sup>2</sup>, Mariajose Martínez<sup>1</sup>, Alberto Carbajo<sup>1</sup>  
<sup>1</sup>Analog Devices Inc., Spain; <sup>2</sup>Analog Devices, Inc, Ireland

**11:00**  
**NOVEL HIGH RESOLUTION TACTILE ROBOTIC FINGERTIPS**.....791  
Alin Drimus, Vince Jankovics, Matija Gorsic, Stefan Mátéfi-Tempfli  
*University of Southern Denmark, Denmark*

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**10:00 - 11:30**  
**B1L-C: METAL OXIDE GAS SENSORS**  
**Auditorium 3A**  
**Session Chair: Eduard Llobet (Universitat Rovira i Virgili, Spain)**

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**10:00**  
**ENERGY-EFFICIENT ATMOSPHERIC CO CONCENTRATION SENSING WITH ON-DEMAND OPERATING MOX GAS SENSOR** .....795  
Dinko Oletic, Vana Jelcic, Dario Antolovic, Vedran Bilas  
*University of Zagreb, Croatia*

<b>10:15</b>	<b>INTERPLAY BETWEEN ACTIVE SITES OF MODIFIED NANOCRYSTALLINE TIN DIOXIDE AND SELECTIVITY TO CO AND NH<sub>3</sub> GASES .....</b>	<b>799</b>
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<b>10:30</b>	<b>ZNO AS FUNCTIONAL MATERIAL FOR SUB-PPM ACETONE DETECTION .....</b>	<b>803</b>
	Ambra Fioravanti <sup>1</sup> , Antonino Bonanno <sup>1</sup> , Maria Cristina Carotta <sup>1</sup> , Sandro Gherardi <sup>2</sup> , Stefano Lettieri <sup>1</sup> , Pasqualino Maddalena <sup>3</sup> , Emanuele Orabona <sup>3</sup> , Deborah Katia Pallotti <sup>3</sup> , Roberto Paoluzzi <sup>1</sup> <sup>1</sup> Consiglio Nazionale delle Ricerche, Italy; <sup>2</sup> Università degli Studi di Ferrara, Italy; <sup>3</sup> Università degli Studi di Napoli Federico II, Italy	
<b>10:45</b>	<b>SELECTIVE HYDROGEN DETECTION WITH TiO<sub>2</sub> NANOFILM VIA THE POROUS-ALUMINA-ASSISTED ANODIZING OF TITANIUM LAYERS.....</b>	<b>807</b>
	Rosa Maria Vázquez <sup>2</sup> , Francesc Gispert-Guirado <sup>2</sup> , Eduard Llobet <sup>2</sup> , Alexander Mozalev <sup>1</sup> <sup>1</sup> Brno University of Technology, Czech Rep.; <sup>2</sup> Universitat Rovira i Virgili, Spain	
<b>11:00</b>	<b>A COMPARATIVE STUDY ON METHANOL SENSING PERFORMANCE OF ZNO NANOFLOWER AND NANOROD BASED RESISTIVE DEVICES.....</b>	<b>811</b>
	Debanjan Acharyya, Nabaneeta Banerjee, Partha Bhattacharyya <i>Indian Institute of Engineering Science and Technology Shibpur, India</i>	
<b>11:15</b>	<b>THERMAL METHOD OF GAS SEPARATION WITH MICRO-PORES.....</b>	<b>815</b>
	Shoeji Nakaye <sup>1</sup> , Hiroshi Sugimoto <sup>1</sup> , Naveen Gupta <sup>2</sup> , Yogesh Gianchandani <sup>2</sup> <sup>1</sup> Kyoto University, Japan; <sup>2</sup> University of Michigan, United States	

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**10:00 - 11:30**

**B1L-D: NOVEL SENSORS - PHENOMENA AND EVALUATION**

**Auditorium 3B**

**Session Chair: Bernhard Jakoby (Johannes Kepler University Linz, Austria)**

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<b>10:00</b>	<b>QUANTIZED CURRENT CONDUCTION IN MEMRISTORS AND ITS PHYSICAL MODEL .....</b>	<b>819</b>
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<b>10:15</b>	<b>STUDY OF A PIEZORESISTIVE CANTILEVER USED AS A TEMPERATURE SENSING STRUCTURE IN LOW TEMPERATURE ENVIRONMENTS .....</b>	<b>823</b>
	Jian-Qiu Huang <sup>2</sup> , Qing-Hai Liu <sup>2</sup> , Chun-Hua Cai <sup>1</sup> <sup>1</sup> Hohai University, China; <sup>2</sup> Southeast University, China	
<b>10:30</b>	<b>ELECTRO-THERMAL SIMULATION AND CHARACTERIZATION OF VERTICALLY ALIGNED CNTS DIRECTLY GROWN ON A SUSPENDED MICROHOPLATE FOR THERMAL MANAGEMENT APPLICATIONS.....</b>	<b>827</b>
	Cinzia Silvestri, Paolo Picciafoco, Bruno Morana, Fabio Santagata, Kouchi Zhang, Pasqualina M. Sarro <i>Technische Universiteit Delft, Netherlands</i>	

**10:45**  
**TIME DOMAIN RESONANCE FREQUENCY MEASUREMENT OF INDUCTIVELY COUPLED RESONANT SENSORS USING THE MATRIX PENCIL METHOD.....831**  
 Sebastian Sauer, Wolf-Joachim Fischer  
*Technische Universität Dresden, Germany*

**11:00**  
**INVESTIGATION OF AN ENCIRCLING PULSED EDDY CURRENT PROBE FOR CORROSION DETECTION .....835**  
 Shiva Majidnia<sup>1</sup>, Rajogopal Nilavalan<sup>1</sup>, John Rudlin<sup>2</sup>  
<sup>1</sup>*Brunel University, United Kingdom;* <sup>2</sup>*TWI Ltd., United Kingdom*

**11:15**  
**RFID-BASED SENSING TECHNOLOGY WITH MICROSTRIP LINES .....839**  
 Hiroshi Fukuda, Keishi Kosaka, Wataru Hattori  
*NEC Corporation, Japan*

**10:00 - 11:30**  
**B1L-E: MEDICAL FORCE SENSORS**  
**Rooms 1 & 2**  
**Session Chairs: Seong Ho Kong (Kyungpook National University, South Korea), Mitsuhiro Shikida (Hiroshima City University, Japan; Nagoya University, Japan)**

**10:00**  
**A MULTIPOINT THIN FILM POLYMER PRESSURE/FORCE SENSOR TO VISUALIZE TRADITIONAL MEDICINE PALPATIONS .....843**  
 Xiaoyu Mi, Fumihiko Nakazawa  
*Fujitsu Laboratories Ltd., Japan*

**10:15**  
**A FLEXIBLE SKIN PILOERECTION MONITORING SENSOR .....847**  
 Jaemin Kim, Dae Geon Seo, Young-Ho Cho  
*Korea Advanced Institute of Science and Technology, South Korea*

**10:30**  
**ON-CHIP FLEXIBLE MULTI-LAYER SENSORS FOR HUMAN STRESS MONITORING.....851**  
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*Korea Advanced Institute of Science and Technology, South Korea*

**10:45**  
**FLEXIBLE 3-AXES CAPACITIVE PRESSURE SENSOR ARRAY FOR MEDICAL APPLICATIONS .....855**  
 Thi-Hong-Nhung Dinh, Pierre-Yves Joubert, Emile Martincic, Elisabeth Dufour-Gergam  
*Université Paris Sud, France*

**11:00**  
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 Shenshen Zhao, Chang Liu  
*Northwestern University, United States*

**11:15**  
**CONFORMABLE TACTILE SENSING USING SCREEN PRINTED P(VDF-TRFE) AND MWCNT-PDMS COMPOSITES .....862**  
 Saleem Khan<sup>2</sup>, Ravinder Singh Dahiya<sup>4</sup>, Sajina Tinku<sup>3</sup>, Leandro Lorenzelli<sup>1</sup>  
<sup>1</sup>*Fondazione Bruno Kessler, Italy;* <sup>2</sup>*Università degli Studi di Trento, Italy;* <sup>3</sup>*Università degli Studi di Trento & Fondazione Bruno Kessler, Italy;* <sup>4</sup>*University of Glasgow, United Kingdom*

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10:00 - 11:30

**B1L-F: NANOBIOSENSORS**

Rooms 3 & 4

Session Chair: Avi Zadok (Bar-Ilan University, Israel)

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10:00

**HIGH SENSITIVE DETECTION IN TUMOR EXTRACTS WITH SINW-FET IN-AIR BIOSENSORS.....866**

Francesca Puppo<sup>1</sup>, Marie-Agnès Doucey<sup>3</sup>, Jean-François Delaloye<sup>4</sup>, Thomas Moh<sup>2</sup>, Gregory Pandraud<sup>2</sup>, Pasqualina M. Sarro<sup>2</sup>, Giovanni De Micheli<sup>1</sup>, Sandro Carrara<sup>1</sup>

<sup>1</sup>*École Polytechnique Fédérale de Lausanne, Switzerland*; <sup>2</sup>*Technische Universiteit Delft, Netherlands*; <sup>3</sup>*Université de Lausanne, Switzerland*; <sup>4</sup>*University Hospital of Lausanne, Switzerland*

10:15

**FLUIDICALLY AND ELECTRICALLY INTEGRATED SOLID STATE NANOPORE ARRAYS**

**FOR BIOCHEMICAL SENSING .....870**

Mate Varga<sup>2</sup>, Zsófia Bérczes<sup>2</sup>, Levente Illés<sup>2</sup>, György Sáfrány<sup>2</sup>, István Bársony<sup>2</sup>, Péter Fürjes<sup>2</sup>, Robert Gyurcsányi<sup>1</sup>, Gyula Jágerszki<sup>1</sup>

<sup>1</sup>*Budapest University of Technology and Economics, Hungary*; <sup>2</sup>*Hungarian Academy of Sciences, Hungary*

10:30

**TIO<sub>2</sub> AND SHRINK INDUCED TUNABLE GRAPHENE COMPOSITES BASED ON NANO**

**SELF ASSEMBLY FOR BIOSENSORS.....873**

Peng Li<sup>2</sup>, Gaoshan Jing<sup>1</sup>, Tianhong Cui<sup>4</sup>, Bo Zhang<sup>3</sup>

<sup>1</sup>*Tsinghua University, China*; <sup>2</sup>*Tsinghua University & University of Minnesota, China*; <sup>3</sup>*University of Minnesota, United States*; <sup>4</sup>*University of Minnesota & Tsinghua University, United States*

10:45

**A PARYLENE-C BASED 16 CHANNELS FLEXIBLE BIO-ELECTRODE FOR ECG RECORDING .....877**

Lei-Chun Chou, Shang-Wei Tsai, Wun-Lun Chang, Jin-Chern Chiou, Tzai-Wen Chiu

*National Chiao Tung University, Taiwan*

11:00

**MICROFLUIDIC ELISA FOR SENSING OF PROSTATE CANCER BIOMARKERS USING**

**INTEGRATED A-SI:H P-I-N PHOTODIODES .....881**

Narayanan Madaboosi<sup>1</sup>, Catarina R. Pedrosa<sup>1</sup>, Miguel F. Reis<sup>2</sup>, Ruben R.G. Soares<sup>2</sup>, Virginia Chu<sup>1</sup>, João Pedro Conde<sup>3</sup>

<sup>1</sup>*INESC Microsistemas e Nanotecnologias, Portugal*; <sup>2</sup>*Instituto Superior Tecnico, Universidade de Lisboa, Portugal*; <sup>3</sup>*Universidade de Lisboa, Portugal*

11:15

**INTEGRATED POINT-OF-CARE SINW BIOSENSORS .....885**

Mohd Azraie Mohd Azmi, Zari Tehrani, Daniel Thomas, Gareth Blayney, Owen Guy

*Swansea University, United Kingdom*

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12:00 - 13:45

**B2L-A: SPECIAL SESSION: PHOTONIC & PHONONIC CRYSTAL SENSORS**

Auditorium 1

Session Chair: Ralf Lucklum (Otto von Guericke Universitaet, Germany), Giuseppe Barillaro (Univerisity of Pisa, Italy)

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12:00

**INVITED TALK: PHOTONIC CRYSTAL BIOSENSORS .....paper not available**

Brian Cunningham

*University of Illinois at Urbana-Champaign, United States*

**12:30**  
**PHOTONIC CRYSTAL CAVITIES FOR INTEGRATED SENSING ..... 889**

Mark G. Scullion<sup>2</sup>, Thomas F. Krauss<sup>2</sup>, Andrea Di Falco<sup>1</sup>  
<sup>1</sup>University of St Andrews, United Kingdom; <sup>2</sup>University of York, United Kingdom

**12:45**  
**HIGH SENSITIVITY GAS DETECTION USING HOLLOW CORE PHOTONIC BANDGAP FIBRES  
DESIGNED FOR MID-IR OPERATION ..... 891**

Marco Petrovich, Natalie Wheeler, Alexander Heidt, Naveen Baddela, Seyed Reza Sandoghchi, Yong Chen,  
Francesco Poletti, David J. Richardson  
University of Southampton, United Kingdom

**13:00**  
**Impulsively Excited Surface Phononic Crystals: a Route Towards Novel Sensing Schemes ..... 895**

Damiano Nardi<sup>3</sup>, Margaret Murnane<sup>3</sup>, Henry Kapteyn<sup>3</sup>, Marco Travaglini<sup>1</sup>, Gabriele Ferrini<sup>2</sup>, Claudio Giannetti<sup>2</sup>,  
Francesco Banfi<sup>2</sup>  
<sup>1</sup>Scuola Normale Superiore and Istituto Nanoscienze / Consiglio Nazionale delle Ricerche, Italy; <sup>2</sup>Università Cattolica  
del Sacro Cuore, Italy; <sup>3</sup>University of Colorado Boulder, United States

**13:15**  
**DETECTION OF BIOMOLECULES WITH 1D PHOTONIC CRYSTALS BASED ON POROUS SILICON ..... 899**

Claudia Pacholski  
Max-Planck-Gesellschaft zur Förderung der Wissenschaften e. V., Germany

**13:30**  
**PHONONIC CRYSTAL SENSOR FOR MEDICAL APPLICATIONS ..... 903**

Ralf Lucklum<sup>2</sup>, Mikhail Zubtsov<sup>2</sup>, Ralf Grundmann<sup>2</sup>, Simon Villa Arango<sup>1</sup>  
<sup>1</sup>Escuela de Ingeniería de Antioquia, Colombia; <sup>2</sup>Otto-von-Guericke-Universität Magdeburg, Germany

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**12:00 - 13:30**  
**B2L-B: INTERFACING & RESONANT SENSORS**

**Auditorium 2**

**Session Chairs: Michael Maharbiz (UC Berkeley, United States), Patrick Pons (CNRS LAAS, Toulouse, France)**

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**12:00**  
**COMPACT DDS-BASED SYSTEM FOR CONTACTLESS INTERROGATION OF RESONANT  
SENSORS BASED ON TIME-GATED TECHNIQUE ..... 907**

Marco Ferrari, Marco Baù, Manuel Pagnoni, Vittorio Ferrari  
Università degli Studi di Brescia, Italy

**12:15**  
**CMOS 0.18  $\mu\text{m}$  STANDARD PROCESS CAPACITIVE MEMS HIGH-Q OSCILLATOR WITH ULTRA  
LOW-POWER TIA READOUT SYSTEM ..... 911**

Fu-Yen Kuo, Chia-Fong Chang, Kuei-Ann Wen  
National Chiao Tung University, Taiwan

**12:30**  
**A ROTATIONAL CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCER (RCMUT) ..... 915**

Donghwan Kim, Michael Kuntzman, Neal Hall  
University of Texas at Austin, United States

**12:45**  
**NONLINEARITY CHARACTERISTIC OF DISK RESONATOR ..... 918**

Wei Luo, Hui Zhao, Bohua Peng, Jicong Zhao, Quan Yuan, Jinling Yang, Fuhua Yang  
Chinese Academy of Sciences, China

**13:00**  
**BACKGROUND CALIBRATED MEMS GYROSCOPE.....922**  
Burak Eminoglu<sup>2</sup>, Mitchell Kline<sup>1</sup>, Igor Izyumin<sup>2</sup>, Yu-Ching Yeh<sup>2</sup>, Bernhard Boser<sup>2</sup>  
<sup>1</sup>Nest Labs, United States; <sup>2</sup>University of California, Berkeley, United States

**13:15**  
**MUTUAL INDUCTANCE SUPPRESSED STACKED INDUCTORS FOR PASSIVE WIRELESS  
MULTI-PARAMETER SENSORS .....926**  
Ralf Lei Dong, Li-Feng Wang, Qing-Ying Ren, Qing-An Huang  
Southeast University, China

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**12:00 - 13:30**  
**B2L-C: OPTICAL CHEMICAL SENSOR SYSTEMS**  
**Auditorium 3A**  
**Session Chairs: Eduard Llobet (Universitat Rovira i Virgili, Spain)**

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**12:00**  
**FUNCTIONALIZED NANOPOROUS MATERIALS FOR VOLATILE METABOLITES MONITORING  
WITH DIRECT OPTICAL TRANSDUCTION .....930**  
Marjorie Vrignaud, Zoé Buniazet, Pierre Marcoux, Jean Hue, Isabelle Texier-Nogues, Florence Ricoul  
Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France

**12:15**  
**LOW POWER NDIR CO2 SENSOR BASED ON CMOS IR EMITTER FOR BOILER APPLICATIONS .....934**  
Syed Zeeshan Ali<sup>1</sup>, Andrea De Luca<sup>3</sup>, Zoltan Racz<sup>4</sup>, Piers Tremlett<sup>2</sup>, Tracy Wotherspoon<sup>2</sup>, Julian William Gardner<sup>5</sup>,  
Florin Udrea<sup>3</sup>  
<sup>1</sup>Cambridge CMOS Sensors Ltd, United Kingdom; <sup>2</sup>Microsemi Ltd, United Kingdom; <sup>3</sup>University of Cambridge, United Kingdom; <sup>4</sup>University of Durham, United Kingdom; <sup>5</sup>University of Warwick, United Kingdom

**12:30**  
**DESIGN OF A MULTILAYERED ABSORBER STRUCTURE BASED ON SU-8 EPOXY  
FOR BROAD AND EFFICIENT ABSORPTION IN MID-IR SENSITIVE THERMAL DETECTORS .....938**  
Shakeel Ashraf<sup>1</sup>, Claes Mattsson<sup>1</sup>, Göran Thungström<sup>1</sup>, Henrik Rödjegård<sup>2</sup>  
<sup>1</sup>Mid Sweden University, Sweden; <sup>2</sup>SenseAir AB, Sweden

**12:45**  
**LINEAR SENSOR FOR AREAL SUBSURFACE GAS MONITORING - CALIBRATION ROUTINE  
AND VALIDATION EXPERIMENTS .....942**  
Matthias Bartholmai<sup>1</sup>, Patrick Paul Neumann<sup>1</sup>, Klaus-Dieter Werner<sup>1</sup>, Sebastian Ebert<sup>1</sup>, Detlef Lazik<sup>2</sup>  
<sup>1</sup>Federal Institute for Materials Research and Testing, Germany; <sup>2</sup>Helmholtz Centre for Environmental Research, Germany

**13:00**  
**FUNCTIONLIZED AUNPS BY DYE MATERIALS FOR CHEMICAL SENSOR APPLICATION .....946**  
Masashi Watanabe, Rhohei Yokoyama, Ayana Oiwa, Chuanjun Liu, Kenshi Hayashi  
Kyushu University, Japan

**13:15**  
**OPTOCHEMICAL SENSORS BASED ON POLYMER NANOFIBERS WITH ULTRA-FAST RESPONSE  
CHARACTERISTICS .....950**  
Christian Wolf<sup>1</sup>, Martin Tscherner<sup>1</sup>, Stefan Köstler<sup>1</sup>, Volker Ribitsch<sup>2</sup>  
<sup>1</sup>Joanneum Research Forschungsgesellschaft mbH, Austria; <sup>2</sup>Karl-Franzens-Universität Graz, Austria



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12:00 - 13:30

**B2L-D: SENSOR MODELING AND OPTIMIZATION**

Auditorium 3B

Session Chairs: Srinivas Tadigadapa (The Pennsylvania State University, United States), Sebastian Wöckel (Institute for Automation and Communication, Magdeburg, Germany)

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12:00

**MODELLING OF A MICRO CORIOLIS MASS FLOW SENSOR FOR SENSITIVITY IMPROVEMENT .....954**

Jarno Groenesteijn<sup>1</sup>, Bert van de Ridder<sup>1</sup>, Joost Lötters<sup>2</sup>, Remco Wiegerink<sup>1</sup>

<sup>1</sup>Universiteit Twente, Netherlands; <sup>2</sup>Universiteit Twente & Bronkhorst High-Tech BV, Netherlands

12:15

**EFFICIENT NUMERICAL MODELING OF OSCILLATORY FLUID-STRUCTURE INTERACTION .....958**

Erwin K. Reichel<sup>2</sup>, Martin Heinisch<sup>2</sup>, Bernhard Jakoby<sup>2</sup>, Thomas Voglhuber-Brunnmaier<sup>1</sup>

<sup>1</sup>Donau-Universität Krems / Johannes Kepler Universität Linz, Austria; <sup>2</sup>Johannes Kepler Universität Linz, Austria

12:30

**ANALYSIS OF ENERGY CONSUMPTION FOR WEARABLE ECG DEVICES .....962**

Jungyoon Kim<sup>2</sup>, Chao-Hsien Chu<sup>1</sup>

<sup>1</sup>Pennsylvania State University, United States; <sup>2</sup>Singapore Management University, Singapore

12:45

**ALN SHEAR MODE SOLIDLY MOUNTED RESONATOR WITH TEMPERATURE COMPENSATION FOR IN-LIQUID SENSING .....966**

Mario DeMiguel-Ramos, Jimena Olivares, Marta Clement, Teona Mirea, Jesús Sangrador, Enrique Iborra, Mariano Barba

Universidad Politécnica de Madrid, Spain

13:00

**EVALUATION OF GAS PERMEABILITY FOR MICRO-SCALE THIN POLYMER FILM WITH ENCAPSULATED MEMS DAMPED OSCILLATOR .....970**

Ryunosuke Gando, Naofumi Nakamura, Yumi Hayashi, Daiki Ono, Kei Masunishi, Yasushi Tomizawa, Hiroaki Yamazaki, Tamio Ikehashi, Yoshiaki Sugizaki, Hedeki Shibata

Toshiba Corporation, Japan

13:15

**CONTACT RESISTANCE, STICTION FORCE, AND FIELD-ASSISTED GROWTH AND MIGRATION IN MEMS AND NEMS METALS .....974**

Massood Tabib-Azar, Nazmul Hassan, Hoorad Pourzand, Pradeep Pai

University of Utah, United States

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12:00 - 13:30

**B2L-E: MEMS RESONANT TRANSDUCERS**

Rooms 1 & 2

Session Chairs: Ajit Sharma (Texas Instruments, United States), Michiel Pertjjs (Technische Universiteit Delft, Netherlands)

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12:00

**DESIGN OF A NOVEL MICROMACHINED NON-CONTACT RESONANT VOLTAGE SENSOR FOR POWER DISTRIBUTION SYSTEMS .....978**

Chunrong Peng<sup>1</sup>, Pengfei Yang<sup>2</sup>, Xiaolong Wen<sup>1</sup>, Dongming Fang<sup>1</sup>, Shanhong Xia<sup>1</sup>

<sup>1</sup>Chinese Academy of Sciences, China; <sup>2</sup>Peking University, China

<b>12:15</b>	<b>SUBWAVELENGTH PLASMONIC ABSORBERS FOR SPECTRALLY SELECTIVE RESONANT INFRARED DETECTORS.....</b>	<b>982</b>
	Vikrant Gokhale, Paul Myers, Mina Rais-Zadeh <i>University of Michigan, United States</i>	
<b>12:30</b>	<b>HIGH RESOLUTION CALORIMETRIC SENSING BASED ON ALUMINUM NITRIDE MEMS RESONANT THERMAL DETECTORS.....</b>	<b>986</b>
	Zhenyun Qian, Raul Vyas, Yu Hui, Matteo Rinaldi <i>Northeastern University, United States</i>	
<b>12:45</b>	<b>AN ULTRA HIGH-Q MICROMECHANICAL IN-PLANE TUNING FORK.....</b>	<b>990</b>
	Xiaobo Guo, Emad Mehdizadeh, Varun Kumar, Alireza Ramezany, Siavash Pourkamali <i>University of Texas at Dallas, United States</i>	
<b>13:00</b>	<b>OUT-OF-PLANE ELECTRODE ARCHITECTURE FOR FUSED SILICA MICRO-GLASSBLOWN 3-D WINEGLASS RESONATORS.....</b>	<b>994</b>
	Doruk Senkal, Mohammed Ahamed, Mohammad Asadian, Sina Askari, Andrei Shkel <i>University of California, Irvine, United States</i>	
<b>13:15</b>	<b>ELECTROSTATIC STABILIZATION OF THERMAL VARIATION IN QUALITY FACTOR USING ANCHOR LOSS MODULATION.....</b>	<b>998</b>
	Jie Han, Sergei A. Zotov, Brenton R. Simon, Igor P. Prikhodko, Gunjana Sharma, Alexander Trusov, Andrei Shkel <i>University of California, Irvine, United States</i>	

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**12:00 - 13:15**  
**B2L-F: ELECTROCHEMICAL BIOSENSORS AND APPLICATIONS**  
**Rooms 3 & 4**  
**Session Chair: Stefan Rupitsch (Erlangen University, Germany)**

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<b>12:00</b>	<b>LOW-COST AND HIGH-PERFORMANCE MICRO-CHANNEL INTEGRATED BIOSENSOR SYSTEMS .....</b>	<b>1002</b>
	Peng Li <sup>1&amp;2</sup> , Gaoshan Jing <sup>1</sup> , Tianhong Cui <sup>1&amp;2</sup> , Bo Zhang <sup>2</sup> <sup>1</sup> Tsinghua University, China; <sup>2</sup> University of Minnesota, United States	

<b>12:15</b>	<b>CONVECTION-BASED REALTIME POLYMERASE CHAIN REACTION (PCR) UTILIZING TRANSPARENT GRAPHENE HEATERS.....</b>	<b>1006</b>
	Kwang Hyo Chung, Yo Han Choi, Hong Kyw Choi, Jin Tae Kim, Young-Jun Yu, Jin Sik Choi, Doo-Hyeb Youn, Choon-Gi Choi <i>Electronics and Telecommunications Research Institute, South Korea</i>	

<b>12:30</b>	<b>DNA DETECTION USING MICROBEADS-BASED DIELECTROPHORETIC IMPEDANCE MEASUREMENT.....</b>	<b>1010</b>
	Michihiko Nakano, Zhenhao Ding, Hiromichi Kasahara, Junya Suehiro <i>Kyushu University, Japan</i>	

**12:45**  
**RESPONSE PREDICTION OF AN INSECT'S OLFACTORY RECEPTOR NEURON BY USING STRUCTURAL PARAMETERS OF ODORANT AND SELF-ORGANIZING MAP ..... 1014**  
Yuki Harada<sup>1</sup>, Tomoki Kazawa<sup>2</sup>, Ryohei Kanzaki<sup>2</sup>, Takamichi Nakamoto<sup>1</sup>  
<sup>1</sup>Tokyo Institute of Technology, Japan; <sup>2</sup>University of Tokyo, Japan

**13:00**  
**FLEXIBLE MICROFLUIDIC BIO-LAB-ON-A-CHIP MULTI-SENSOR PLATFORM FOR ELECTROCHEMICAL MEASUREMENTS..... 1018**  
Ana Moya<sup>1</sup>, Xavier Illa<sup>1</sup>, Elisabet Prats-Alfonso<sup>1</sup>, Nadia Zine<sup>2</sup>, Gemma Gabriel<sup>1</sup>, Abdelhamid Errachid<sup>2</sup>, Rosa Villa<sup>1</sup>  
<sup>1</sup>Consejo Superior de Investigaciones Científicas, Spain; <sup>2</sup>Université Claude-Bernard Lyon 1, France

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**12:00 - 13:30**  
**B2L-G: LATE NEWS: OTHER SENSING APPLICATIONS**  
**Rooms 6 & 7**  
**Session Chair: Francisco Falcone (Universidad Pública de Navarra, Spain)**

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**12:00**  
**A NOVEL APPROACH FOR ATTITUDE ESTIMATION USING MEMS INERTIAL SENSORS ..... 1022**  
Zheming Wu, Zhenguo Sun, Wenzeng Zhang, Qiang Chen  
Tsinghua University, China

**12:15**  
**ULTRASOUND-BASED AIR LEAK DETECTION USING A RANDOM MICROPHONE ARRAY AND SPARSE REPRESENTATIONS ..... 1026**  
Jan Steckel, Herbert Peremans  
Universiteit Antwerpen, Belgium

**12:30**  
**ROTATION AND TRANSLATION INVARIANT OBJECT RECOGNITION WITH A TACTILE SENSOR..... 1030**  
Shan Luo<sup>1</sup>, Wenxuan Mou<sup>2</sup>, Min Li<sup>1</sup>, Kaspar Althoefer<sup>1</sup>, Hongbin Liu<sup>1</sup>  
<sup>1</sup>King's College London, United Kingdom; <sup>2</sup>Queen Mary University, United Kingdom

**12:45**  
**AUTOMATIC DETECTION OF TRANSMISSION TOWERS..... 1034**  
Olivier Steiger, Erwan Lucas, Yannick Maret  
ABB Ltd., Switzerland

**13:00**  
**SUPER RESOLUTION INFRARED CAMERA USING SINGLE CARBON NANOTUBE PHOTODETECTOR..... 1038**  
Liangliang Chen, Zhanxin Zhou, Ning Xi, Ruiguo Yang, Bo Song, Zhiyong Sun, Chengzhi Su  
Michigan State University, United States

**13:15**  
**A CARBON NANOTUBE BASED RESETTABLE SENSOR FOR MEASURING FREE CHLORINE IN DRINKING WATER ..... 1042**  
Leo Huan-Hsuan Hsu, Enamul Houque, Ravi Selvaganapathy, Peter Kruse  
McMaster University, Canada

## TUESDAY, NOVEMBER 4TH – POSTER SESSION

15:00 - 16:20

### B3P-H: OPTICAL AND TRACE LEVEL DETECTION

Poster Area - Foyer

Session Chair: Bernhard Jakoby (Johannes Kepler University Linz, Austria)

#### IMPROVEMENT OF ADSORPTION PERFORMANCE OF MICROPRECONCENTRATOR BY USING CNT FOR TRACE LEVEL BIOMARKER DETECTION .....1046

Koji Oyama<sup>2</sup>, Naoki Kakita<sup>2</sup>, Hidetoshi Miyashita<sup>2</sup>, Satoru Kishida<sup>2</sup>, Jeong-O Lee<sup>1</sup>, Sang-Seok Lee<sup>2</sup>  
<sup>1</sup>Korea Research Institute of Chemical Technology, South Korea; <sup>2</sup>Tottori University, Japan

#### VIBRATION SENSITIVITY REDUCTION OF PHOTOACOUSTIC GAS ANALYZERS .....1050

Yannick Maret, Daniele Angelosante, Olivier Steiger, Detlef Pape, Miklos Lenner  
ABB Ltd., Switzerland

#### OPTICAL GAS SENSOR BASED ON AN ANDROID APPLICATION FOR REAL-TIME, RECONFIGURABLE SPECTROSCOPIC DATA ANALYSIS .....1054

Dmitry Duda, Pedro Martín-Mateos, Borja Jerez, Marta Ruiz-Llata, Pablo Acedo  
Universidad Carlos III de Madrid, Spain

#### DETECTION OF VAPOUR EXPLOSIVES BY A MULTI-SENSOR PROTOTYPE-PERFORMANCE EVALUATION UNDER LABORATORY AND REAL CONDITIONS .....1057

Celine Frenois, Christelle Barthet, Franck Pereira, Benoit Minot, Florian Veignal, Stephanie Besnard, Rodrigue Rousier, Aurelien Mayoue  
Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France

#### MACROPOROUS SILICON FOR SPECTROSCOPIC CO<sub>2</sub> DETECTION .....1061

Didac Vega, Ferran Martí, Angel Rodriguez, Trifon Trifonov  
Universitat Politècnica de Catalunya, Spain

#### REDOX CHEMO-CHROMIC SENSORS FOR DETECTING BLOOD GLUCOSE LEVELS IN DIABETICS .....1065

Rakesh Nair, Akhil Moorthi  
Technische Universität Chemnitz, Germany

#### DETECTION OF 2,4-DINITROTOLUENE (DNT) USING GRAVURE PRINTED SURFACE ENHANCEMENT RAMAN SPECTROSCOPY (SERS) FLEXIBLE SUBSTRATE .....1069

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

#### NO<sub>2</sub> OPTICAL FIBER SENSOR BASED ON TFBG COATED WITH LUPC<sub>2</sub> .....1073

Antonio Bueno<sup>2</sup>, Marc Debliquy<sup>2</sup>, Driss Lahem<sup>1</sup>, Alexandre Van Baekel<sup>2</sup>, Patrice Mégret<sup>2</sup>, Christophe Caucheteur<sup>2</sup>  
<sup>1</sup>MateriaNova ASBL, Belgium; <sup>2</sup>Université de Mons, Belgium

#### MICROPLASMA CHAMBER FOR MOLECULAR EMISSION SPECTROSCOPY .....1077

Tamás Kárpáti, István Bársony, Péter Fürjes  
Hungarian Academy of Sciences, Hungary

#### ALL-FIBER MACH-ZEHNDER INTERFEROMETER USING A TAPERED PHOTONIC CRYSTAL FIBER FOR REFRACTIVE INDEX MEASUREMENT .....1080

Yong Zhao, Di Wu, Qi Wang  
Northeastern University, China

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15:00 - 16:20

**B3P-J: ELECTROCHEMICAL BIOSENSORS**

Poster Area - Foyer

Session Chairs: Cecilia Jimenez (IMB-CNM (CSIC), Spain), Francesco Giuseppe Della Corte (Università degli Studi Mediterranea di Reggio Calabria, Italy)

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**A THREE SENSOR EYE TRACKING SYSTEM BASED ON ELECTROOCULOGRAPHY .....1084**

Natasha Steinhausen, Robert Prance, Helen Prance  
*University of Sussex, United Kingdom*

**INKJET PRINTING OF ORGANIC ELECTROCHEMICAL IMMUNOSENSORS .....1088**

Rita Faddoul, Romain Coppard, Thomas Berthelot  
*Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France*

**MULTICHANNEL MULTIMODAL NANO-WATT CMOS IMPLANTABLE BIOSENSOR FOR SIMULTANEOUS NEUROCHEMICAL AND AP RECORDING WITH RESOURCE SHARING .....B#5**

Mohammad Poustinchi, Sam Musallam  
*McGill University, Canada*

**CMOS POTENTIOSTAT AND SENSOR WITH MULTILAYER MEMBRANE FOR WIDE RANGE MEASUREMENTS OF GLUCOSE CONCENTRATIONS .....1096**

Stefan Mross, Peter Fürst, Sebastien Pierrat, Tom Zimmermann, Michael Kraft  
*Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, Germany*

**INKJET PRINTED SILVER PATTERNING ON PDMS TO FABRICATE MICROELECTRODES FOR MICROFLUIDIC SENSING.....1100**

Jianwei Wu<sup>1</sup>, Robert Roberts<sup>2</sup>, Norman C. Tien<sup>2</sup>, Dachao Li<sup>1</sup>  
*<sup>1</sup>Tianjin University, China; <sup>2</sup>University of Hong Kong, Hong Kong*

**DEVELOPMENT OF A NOVEL ISONIAZID-MEMBRANE-FIELD-EFFECT TRANSISTOR.....1104**

Safae Merzouk<sup>4</sup>, Michael Lee<sup>4</sup>, Nicole Jaffrezic-Renault<sup>3</sup>, Abdelhamid Errachid<sup>3</sup>, Nadia Zine<sup>3</sup>, Joan Bausells<sup>2</sup>, Clara Vinas<sup>1</sup>, Francesc Teixidor<sup>1</sup>  
*<sup>1</sup>Institut de Ciència de Materials de Barcelona, Consejo Superior de Investigaciones Científicas, Spain; <sup>2</sup>Instituto de Microelectronica de Barcelona, Spain; <sup>3</sup>Université Claude-Bernard Lyon 1, France; <sup>4</sup>Université de Lyon, France*

**CIRCUIT MODELS FOR NON-FARADAIC CMOS ELECTROCHEMICAL SENSING .....1107**

Philip Gordon<sup>2</sup>, Krishna Jayant<sup>1</sup>, Yingqui Cao<sup>2</sup>, Kshitij Auluck<sup>2</sup>, Joshua Phelps<sup>2</sup>, Edwin Kan<sup>2</sup>  
*<sup>1</sup>Columbia University, United States; <sup>2</sup>Cornell University, United States*

**A NON-INVASIVE FLEXIBLE MULTI-CHANNEL ELECTRODE FOR IN VIVO MOUSE EEG RECORDING .....1111**

Donghyeon Kim, Chanmi Yeon, Euiheon Chung, Kiseon Kim  
*Gwangju Institute of Science and Technology, South Korea*

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15:00 - 16:20

**B3P-K: OPTICAL SENSORS II**

Poster Area - Foyer

Session Chairs: Anna G. Mignani (CNR-Institute of Applied Physics 'Nello Carrara', Italy), Francisco J. Arregui (Public University of Navarra, Spain)

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**VERY HIGH SENSITIVITY ELECTRICALLY MODULATED SI-PHOTODIODE IN PHOTOVOLTAIC-MODE AS PHASE-SENSITIVE DETECTOR OF LIGHT POWER.....1115**

Andrea De Marcellis, Elia Palange, Riccardo Giuliani, Mohammed Janneh  
*Università degli Studi dell'Aquila, Italy*

**MICRO-X-RAY SOURCES FROM FLOWING GASES AND PZT CRYSTALS.....1118**

Olutosin Fawole, Massood Tabib-Azar  
*University of Utah, United States*

**RELIABILITY OF AN ALL-OPTICAL DIFFERENTIAL CURRENT DETECTION TECHNIQUE DURING ENVIRONMENTAL TEMPERATURE PERTURBATIONS.....1121**

Grzegorz Fusiek, Philip Orr, Pawel Niewczas  
*University of Strathclyde, United Kingdom*

**USING THE TAGUCHI METHOD TO OPTIMIZE THE INSPECTION EQUIPMENT FOR HUMAN CHORIONIC GONADOTROPIN DETECTION .....1125**

Chia-Hsien Yeh<sup>2</sup>, Zi-Qi Zhao<sup>2</sup>, Yu-Cheng Lin<sup>2</sup>, Pi-Lan Shen<sup>1</sup>  
<sup>1</sup>*Firststep Bioresearch, Inc., Taiwan;* <sup>2</sup>*National Cheng Kung University, Taiwan*

**TEMPERATURE GRADIENT MEASUREMENTS BASED ON A LONG FIBER BRAGG GRATING AND TIME-DOMAIN ANALYSIS .....1128**

Amelia Lavinia Ricchiuti<sup>2</sup>, David Barrera<sup>2</sup>, Salvador Sales<sup>2</sup>, Koji Nonaka<sup>1</sup>  
<sup>1</sup>*Kochi University of Technology, Japan;* <sup>2</sup>*Universitat Politècnica de València, Spain*

**DESIGN OF A HYBRID OPTOFLUIDIC RING RESONATOR.....1131**

Genni Testa, Gianluca Persichetti, Romeo Bernini  
*Consiglio Nazionale delle Ricerche, Italy*

**DEVELOPMENT AND CHARACTERIZATION OF A FIBRE BRAGG GRATING TEMPERATURE PROBE FOR MEDICAL LASER ABLATION THERAPY.....1134**

Davide Polito<sup>2</sup>, Emiliano Schena<sup>2</sup>, Paola Saccomandi<sup>2</sup>, Sergio Silvestri<sup>2</sup>, Andrea Polimadei<sup>1</sup>, Michele A Caponero<sup>1</sup>  
<sup>1</sup>*Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy;* <sup>2</sup>*Università Campus Bio-Medico di Roma, Italy*

**UNDERWATER LASER-BASED STRUCTURED LIGHT SYSTEM FOR ONE-SHOT 3D RECONSTRUCTION .....1138**

Miquel Massot-Campos, Gabriel Oliver-Codina  
*Universitat de les Illes Balears, Spain*

**EXHALED BREATH OPTICAL FIBER SENSOR BASED ON LMRS FOR RESPIRATION MONITORING.....1142**

Pedro Sanchez, Carlos Ruiz Zamarreño, Miguel Hernaez, Ignacio Raúl Matías, Francisco Javier Arregui  
*Universidad Pública de Navarra, Spain*

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Adolfo Josue Rodríguez Rodríguez<sup>1</sup>, Daniel Alberto May-Arrijoja<sup>1</sup>, Rene Fernando Domínguez Cruz<sup>1</sup>, Carlos Ruiz Zamarreño<sup>2</sup>, Ignacio Raúl Matías<sup>2</sup>, Francisco Javier Arregui<sup>2</sup>  
<sup>1</sup>*Universidad Autónoma de Tamaulipas, Mexico;* <sup>2</sup>*Universidad Pública de Navarra, Spain*

**FLUID TURBULENCE MONITORING BY MEANS OF FBG MESH .....1150**

Carlos Ruiz Zamarreño<sup>1</sup>, Francisco Javier Arregui<sup>1</sup>, Ignacio Raúl Matías<sup>1</sup>, Cicero Martelli<sup>2</sup>,  
Virginia Helena Baroncini<sup>2</sup>, Eduardo dos Santos<sup>2</sup>, Marco Jose da Silva<sup>2</sup>, Rigoberto Eleazar Morales<sup>2</sup>  
<sup>1</sup>Universidad Pública de Navarra, Spain; <sup>2</sup>Universidade Tecnológica Federal do Paraná, Brazil

**AN INFRARED DETECTOR BASED ON SWNT FILM SUSPENDED ON DOUBLE-CANTILEVER .....1153**

Seongho Han, Donggeon Jung, Seongho Kong  
Kyungpook National University, South Korea

**A HIGH-SPEED/POWER LASER TRANSMITTER FOR SINGLE PHOTON IMAGING APPLICATIONS .....1157**

Lauri Hallman, Jaakko Huikari, Juha Kostamovaara  
University of Oulu, Finland

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**15:00 - 16:20**

**B3P-L: MECHANICAL AND PHYSICAL SENSORS II**

Poster Area - Foyer

Session Chair: Seong Ho Kong (Kyungpook National University, South Korea)

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**WEARABLE DISPLACEMENT SENSOR SYSTEM BASED ON ELEVATING TUBE FOR MEASURING BREATHING PATTERN .....1161**

Ryota Ono<sup>2</sup>, Miyoko Matsushima<sup>2</sup>, Tsutomu Kawabe<sup>2</sup>, Mitsuhiro Shikida<sup>1</sup>  
<sup>1</sup>Hiroshima City University, Japan; <sup>2</sup>Nagoya University, Japan

**WIRELESS PASSIVE HIGH-DOSES RADIATION SENSOR .....1165**

Emilie Debourg<sup>1</sup>, Ayoub Rifai<sup>1</sup>, Hervé Aubert<sup>1</sup>, Patrick Pons<sup>1</sup>, Izabela Augustyniak<sup>4</sup>, Pawel Knapkiewicz<sup>4</sup>, Jan Dziuban<sup>4</sup>, Michal Matusiak<sup>2</sup>, Michal Olszacki<sup>2</sup>, D. Lavielle<sup>3</sup>, C. Chatry<sup>3</sup>  
<sup>1</sup>LAAS / CNRS / Université de Toulouse, France; <sup>2</sup>National Centre for Nuclear Research, Poland; <sup>3</sup>TRAD, France; <sup>4</sup>Wroclaw University of Technology, Poland

**HUMAN STEP DETECTION FROM A PIEZOELECTRIC POLYMER FLOOR SENSOR USING NORMALIZATION ALGORITHMS .....1169**

Renan Serra<sup>2</sup>, Pascal Di Croce<sup>1</sup>, Richard Peres<sup>1</sup>, Dominique Knittel<sup>2</sup>  
<sup>1</sup>Tarkett GDL, Luxembourg; <sup>2</sup>Université de Strasbourg, France

**MAGNETICALLY COUPLED RESONATORS FOR RATE INTEGRATING GYROSCOPES .....1173**

Pradeep Pai, Hoorad Pourzand, Massood Tabib-Azar  
University of Utah, United States

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Bruno Andò, Salvatore Baglio, Angela Beninato, Vincenzo Marletta  
Università degli Studi di Catania, Italy

**STABILITY CHARACTERISTICS OF THE DOUBLE POLE WHEEL FOR ACCURATE MAGNETIC SPEED SENSING .....1180**

Vidya Sagar Kantamneni<sup>1</sup>, Nitin Goyal<sup>1</sup>, Tobias Werth<sup>2</sup>, Michael Ortner<sup>1</sup>  
<sup>1</sup>Carinthian Tech Research AG, Austria; <sup>2</sup>Infineon Technologies AG, Austria

**THE EFFECT OF BACK-CHAMBER VOLUME ON THE SURFACE MICROMACHINED ACOUSTIC SENSOR .....1184**

Chang Han Je, Jaewoo Lee, Sung Q Lee, Woo Seok Yang  
Electronics and Telecommunications Research Institute, South Korea

**PULSED EDDY CURRENT IMAGER FOR THE ENHANCED NON DESTRUCTIVE EVALUATION OF AERONAUTICAL RIVETED ASSEMBLIES.....1188**

Pierre-Yves Joubert<sup>2</sup>, Yohan Le Diraison<sup>1</sup>  
<sup>1</sup>Université de Cergy Pontoise, France; <sup>2</sup>Université Paris Sud, France

**SCREEN PRINTED FLEXIBLE CAPACITIVE PRESSURE SENSOR .....1192**

Ali Eshkeiti, Sepehr Emamian, Sai Guruva Reddy Avathu, Binu Baby Narakathu, Michael Joyce, Margaret Joyce, Brad Bazuin, Massood Zandi Atashbar  
Western Michigan University, United States

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**15:00 - 16:20**

**B3P-M: ELECTRONICS & INTERFACING**

**Poster Area - Foyer**

**Session Chairs: Oliver Paul (University of Freiburg, Germany), Gijs Krijnen (University of Twente, Netherlands)**

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**LOW-POWER COLUMN-PARALLEL ADC FOR CMOS IMAGE SENSOR BY LEVERAGING SPATIAL LIKELIHOOD IN NATURAL SCENE .....1196**

Lifen Liu, Hang Yu, Shoushun Chen  
Nanyang Technological University, Singapore

**A MULTI-MODE INTERFACE FOR MEMS VIBRATORY GYROSCOPE WITH SELF-TUNED FILTER ..... B#5**

Tao Yin<sup>1</sup>, Huanming Wu<sup>2</sup>, Guocheng Huang<sup>1</sup>, Haigang Yang<sup>1</sup>  
<sup>1</sup>Chinese Academy of Sciences, China; <sup>2</sup>Ningbo University, China

**SOI CMOS MULTI-SENSORS MEMS CHIP FOR AEROSPACE APPLICATIONS.....1204**

Mohtashim Mansoor<sup>1</sup>, Ibraheem Haneef<sup>1</sup>, Suhail Akhtar<sup>1</sup>, Muhammad Aftab Rafiq<sup>3</sup>, Syed Zeeshan Ali<sup>2</sup>, Florin Udrea<sup>4</sup>  
<sup>1</sup>Air University, Pakistan; <sup>2</sup>Cambridge CMOS Sensors Ltd, United Kingdom; <sup>3</sup>Pakistan Institute of Engineering and Applied Sciences, Pakistan; <sup>4</sup>University of Cambridge, United Kingdom

**AN AUTONOMOUS AND ENERGY EFFICIENT SMART SENSOR PLATFORM .....1208**

Massimo Merenda, Corrado Felini, Francesco Giuseppe Della Corte  
Università degli Studi Mediterranea di Reggio Calabria, Italy

**A READOUT SYSTEM FOR PELLISTORS WITH PULSED THERMAL FEEDBACK .....1212**

Olivier Leman, Mangleshwar Srivastava, Johann Hauer  
Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, Germany

**ACCURATE ANALOG TEMPERATURE CONTROL OF A THIN FILM MICROHEATER ON GLASS SUBSTRATE FOR LAB-ON-CHIP APPLICATIONS .....1216**

Andrea Scorzoni<sup>1</sup>, Michele Tavernelli<sup>1</sup>, Pisana Placidi<sup>1</sup>, Paolo Valigi<sup>1</sup>, Augusto Nascetti<sup>2</sup>  
<sup>1</sup>Italian Università degli Studi di Perugia, Italy; <sup>2</sup>Sapienza - Università di Roma, Italy

**ELECTRICAL INTERFERENCE SUPPRESSION TECHNIQUE FOR 26 X 26 HIGH-DENSITY GROUND REACTION SENSOR ARRAY .....1220**

Qingbo Guo, Carlos Mastrangelo, Darrin Young  
University of Utah, United States



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15:00 - 16:20

**B3P-N: SENSOR NETWORKS II**

Poster Area - Foyer

Session Chairs: Takahiro Yamashita National Institute of Advanced Industrial Science and Technology, Japan), Spyridon Daskalakis (Technical University of Crete, Greece)

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**ANALOG COMPUTATION OVER THE WIRELESS CHANNEL: A PROOF OF CONCEPT.....1224**

Andreas Kortke, Mario Goldenbaum, Slawomir Stanczak  
*Technische Universität Berlin, Germany*

**A SECURITY AND NFC ENHANCED WIRELESS SENSOR NETWORK NODE..... B#5**

Antonio Jonjic<sup>2</sup>, Jasmin Grosinger<sup>1</sup>, Wolfgang Bösch<sup>1</sup>, Thomas Herndl<sup>3</sup>, Rainer Matischek<sup>3</sup>, Gerald Holweg<sup>3</sup>  
<sup>1</sup>Graz University of Technology, Austria; <sup>2</sup>Graz University of Technology & Infineon Technologies AG, Austria; <sup>3</sup>Infineon Technologies AG, Austria

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*National Institute of Advanced Industrial Science and Technology, Japan*

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<sup>1</sup>Keimyung University, South Korea; <sup>2</sup>Pukyong National University, South Korea; <sup>3</sup>Sunway University, Malaysia

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*National Taiwan University, Taiwan*

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Kannan Govindan  
*Samsung Advanced Institute of Technology, India*

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*University of California, Los Angeles, United States*

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*University of California, Los Angeles, United States*

**AN EFFICIENT PARTICLE FILTER-BASED POTENTIAL GAME METHOD FOR DISTRIBUTED SENSOR NETWORK MANAGEMENT .....1256**

Su-Jin Lee, Han-Lim Choi  
*Korea Advanced Institute of Science and Technology, South Korea*

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15:00 - 16:20

**B3P-P: AUTOMATION AND SENSING PLATFORMS**

Poster Area - Foyer

Session Chairs: Salvatore Baglio (Dipartimento di Ingegneria Elettrica Elettronica e Informatica University of Catania, Italy), Ettore Massera (Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy)

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- A CMOS DIGITIZED WIND TRANSDUCER WITH NOISE INSENSITIVITY FOR FLOWERS  
IN GREENHOUSE APPLICATIONS** ..... 1260  
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*National Chiayi University, Taiwan*
- EOG-BASED SYSTEM FOR MOUSE CONTROL** ..... 1264  
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*Tsinghua University, China*
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<sup>1</sup>Commonwealth Scientific and Industrial Research Organisation, Australia; <sup>2</sup>University of Tasmania, Australia
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*University of Manchester, United Kingdom*
- IRRADIATION EFFECTS OF THE INLINE PACKAGED RF MEMS POWER SENSOR** ..... 1284  
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*Southeast University, China*
- SENSOR FUSION OF VISION, FORCE AND ACCELERATION FOR COMPLIANT  
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*Universidad de Jaén, Spain*
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*Universität Bremen, Germany*
- INSTRUMENTATION FOR MONITORING ANIMAL MOVEMENTS** ..... 129\*  
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*Cardiff University, United Kingdom*
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Markus Neumayer, Thomas Bretterkieber  
*Graz University of Technology, Austria*

**TRANSIENT MEASUREMENT METHOD FOR THE THERMAL PROPERTIES OF THE THIN-FILM MEMBRANE IN A MULTI-PARAMETER WIND SENSOR ..... 1304**

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<sup>1</sup>Albert-Ludwigs-Universität Freiburg, Germany; <sup>2</sup>Donau-Universität Krems, Austria; <sup>3</sup>Donau-Universität Krems / Johannes Kepler Universität Linz, Austria; <sup>4</sup>Johannes Kepler Universität Linz, Austria

**MINIMIZE WIRELESS SENSOR NODE BUILT-IN 3-AXIS ACCELERATION METER FOR COW'S RUMEN MONITORING SYSTEM ..... B#5**

Hirofumi Nogami<sup>1</sup>, Hironao Okada<sup>2</sup>, Shozo Arai<sup>3</sup>, Ryutaro Maeda<sup>2</sup>, Toshihiro Itoh<sup>2</sup>

<sup>1</sup>Kyushu University & National Institute of Advanced Industrial Science and Technology, Japan; <sup>2</sup>National Institute of Advanced Industrial Science and Technology, Japan; <sup>3</sup>National Institute of Animal Health, Japan

**MICROFABRICATED IMPEDANCE SENSORS FOR CONCURRENT TACTILE, BIOPOTENTIAL, AND WETNESS DETECTION ..... 1312**

Feiyan Lin, Michael McKnight, James Dieffenderfer, Eric Whitmire, Tushar Ghosh, Alper Bozkurt  
North Carolina State University, United States

**WEARABLE GAIT ANALYSIS SYSTEM FOR AMBULATORY MEASUREMENT OF KINEMATICS AND KINETICS ..... 1316**

Guangyi Li<sup>3</sup>, Tao Liu<sup>3</sup>, Linyi Gu<sup>3</sup>, Yoshio Inoue<sup>2</sup>, Haojie Ning<sup>1</sup>, Meimei Han<sup>1</sup>

<sup>1</sup>Insenco R&D Lab Inc., Japan; <sup>2</sup>Kochi University of Technology, Japan; <sup>3</sup>Zhejiang University, China

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15:00 - 16:20

**B3P-Q: SENSOR MATERIALS AND DEVICES II**

Poster Area - Foyer

Session Chairs: Srinivas Tadigadapa (Pennsylvania State University, United States), Michele Penza (ENEA, Italy)

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**HIGH LEVEL MODELING AND SIMULATION OF A SENSOR SYSTEM FOR VAPOR TRACE DETECTION OF EXPLOSIVES ..... 1320**

Drago Strle

University of Ljubljana, Slovenia

**GLUCOSE WAVEGUIDE SENSOR BASED ON GRAPHENE ..... 1324**

Taehyun Hwang, Jang Ah Kim

Sungkyunkwan University, South Korea

**FUNCTIONAL GRAPHENE COMPOSITE FILMS FOR SURFACE PLASMON RESONANCE SENSOR TECHNOLOGY ..... 1328**

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Sungkyunkwan University, South Korea

**CHARACTERIZATION OF A RESISTIVE VOLTAGE DIVIDER DESIGN FOR WIDEBAND POWER MEASUREMENTS ..... 1332**

Michael Grubmüller, Bernhard Schweighofer, Hannes Wegleiter

Graz University of Technology, Austria

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<sup>1</sup>Aix-Marseille University, France; <sup>2</sup>Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France

**TEST ENVIRONMENT FOR CHARACTERIZATION OF A NANOSCALE SENSOR SYSTEM CONSISTING OF FLUID FLOW SENSORS BASED ON THE THERMAL-TIME-OF-FLIGHT (TTOF) PRINCIPLE AND ABSOLUTE PRESSURE SENSORS ..... 1340**

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*Technische Universität Dortmund, Germany*

**FUNCTIONALIZED MICROMOLDED NANOPARTICLES TOWARDS GAS SENSOR ARRAYS ..... 1344**

Kristen Dorsey, David Rolfe, Gordon Hoople, Albert Pisano  
*University of California, San Diego, United States*

**A FAST TUNABLE SEMICONDUCTOR LASER FOR FBG SENSOR INTERROGATION SYSTEMS ..... 1348**

Jinyu Mo<sup>2</sup>, Logan He<sup>2</sup>, Chao Lu<sup>1</sup>  
<sup>1</sup>*Hong Kong Polytechnic University, Hong Kong;* <sup>2</sup>*Oclaro Technology Co., Ltd, China*

**A HYBRID CSVM-HMM MODEL FOR ACOUSTIC SIGNAL CLASSIFICATION USING A TETRAHEDRAL SENSOR ARRAY ..... 1352**

Hao Wu<sup>2</sup>, Prudhvi Gurram<sup>1</sup>, Heesung Kwon<sup>1</sup>, Saurabh Prasad<sup>2</sup>  
<sup>1</sup>*U.S. Army Research Laboratory, United States;* <sup>2</sup>*University of Houston, United States*

**SPARSE DECOMPOSITION OF IN-AIR SONAR IMAGES FOR OBJECT LOCALIZATION ..... 1356**

Jan Steckel, Herbert Peremans  
*Universiteit Antwerpen, Belgium*

**ON-OFF SENSORS BASED ON STRANGE ATTRACTORS ..... 1360**

Arturo Buscarino, Carlo Famoso, Luigi Fortuna, Mattia Frasca  
*Università degli Studi di Catania, Italy*

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**15:00 - 16:20**

**B3P-R: OPEN POSTER SESSION ..... B#**

**Poster Area - Foyer**

**Session Chair: Javier Calpe (Analog Devices, Spain)**

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**NANOPARTICLE ENHANCED-SPR ON GOLD NANOSLITS FOR ULTRA-SENSITIVE, LABEL-FREE DETECTION OF NUCLEIC ACID BIOMARKERS**

Seyedehmansoureh Zarei Mousavi, Huai-Yi Chen, Kuang-Li Lee, Pei-Kuen Wei, Ji-Yen Cheng  
*Academia Sinica, Taiwan*

**SUSPENDED SOI WAVEGUIDE WITH SUB-WAVELENGTH GRATING CLADDING FOR MID-INFRARED**

Jordi Soler Penades<sup>3</sup>, Carlos Alonso-Ramos<sup>2</sup>, Ali Khokhar<sup>3</sup>, Milos Nedeljkovic<sup>3</sup>, Liam Boodhoo<sup>3</sup>, Alejandro Ortega-Moñux<sup>2</sup>, Iñigo Molina-Fernández<sup>2</sup>, Pavel Cheben<sup>1</sup>, Goran Mashanovich<sup>3</sup>  
<sup>1</sup>*National Research Council, Canada;* <sup>2</sup>*Universidad de Málaga, Spain;* <sup>3</sup>*University of Southampton, United Kingdom*

**MEMS-BASED ULTRA-THIN PIEZOELECTRIC CANTILEVERS WITH ALN THIN FILMS FOR IMPROVED SENSITIVITY**

Md Sajeeb Rayhan, Donald Butler, Zeynep Celik-Butler  
*University of Texas at Arlington, United States*

**CONTINUOUS PREDICTION BASED ON RESERVOIR COMPUTING IN GAS SENSOR ARRAYS**

Sadique Sheik<sup>3</sup>, Santiago Marco<sup>1</sup>, Ramon Huerta<sup>3</sup>, Antonio Pardo<sup>2</sup>, Jordi Fonollosa<sup>3</sup>  
<sup>1</sup>*Institute for Bioengineering of Catalonia, Spain;* <sup>2</sup>*Universitat de Barcelona, Spain;* <sup>3</sup>*University of California, United States*

### **MONITORING OF TRANSVERSE DISPLACEMENT OF REINFORCED CONCRETE BEAMS UNDER FLEXURAL LOADING BY MEANS OF EMBEDDED ARRAYS OF CONVENTIONAL MULTIMODE SILICA OPTICAL FIBERS**

Sergei Khotiaintsev, María Del Carmen López Bautista, Juan Emmanuel González Tinoco, Amalia Nallely Cartro Martínez, Selene Pérez García, Héctor Javier Guzmán Olguín, Enrique Ramón Gómez Rosas  
*Universidad Nacional Autónoma de México, Mexico*

### **A NOVEL BIOSENSOR FOR CONTINUOUS IN-LINE MEASUREMENT OF PLASMIN ACTIVITY IN MILK**

Helen Dacres, Murat Gel, Jian Wang, Alisha Anderson, Stephen Trowell  
*CSIRO, Australia*

### **UTILIZATION OF MACH-ZEHNDER INTERFEROMETER IN A SOLID-FLUID PHONONIC CRYSTAL AS A LIQUID CONCENTRATION SENSOR**

Aysevil Salman<sup>2</sup>, Olgun Adem Kaya<sup>2</sup>, Ahmet Cicek<sup>3</sup>, Bulent Ulug<sup>1</sup>  
<sup>1</sup>*Akdeniz University, Turkey;* <sup>2</sup>*Inonu University, Turkey;* <sup>3</sup>*Mehmet Akif Ersoy University, Turkey*

### **XPS CHARACTERIZATION OF MAGNETO-PLASMONIC NANOMATERIALS FOR SENSING APPLICATIONS**

Mariagrazia Manera<sup>3</sup>, Roberto Rella<sup>3</sup>, Adriano Colombelli<sup>3</sup>, Pierpaolo Lupo<sup>2</sup>, Franca Albertini<sup>2</sup>, Simona Rella<sup>1</sup>, Cosimino Malitesta<sup>1</sup>  
<sup>1</sup>*DiSTeBA-Unisalento, Italy;* <sup>2</sup>*IMEM-CNR, Italy;* <sup>3</sup>*IMM-CNR, Italy*

### **RAPID MEDICAL DIAGNOSIS PLATFORM WITH SENSITIVITY ENHANCED COATING AND MOLECULAR ROTORS AS CONDITIONAL FLUORESCENT LABELS**

Xiaoqun Zhou<sup>1</sup>, Weihua Hu<sup>3</sup>, Changming Li<sup>3</sup>, Min Yen Lee<sup>2</sup>, Yin Nah Teo<sup>2</sup>  
<sup>1</sup>*Institute for Infocomm Research, Singapore;* <sup>2</sup>*Molecular Engineering Laboratory, Singapore;* <sup>3</sup>*Nanyang Technological University, Singapore*

### **PERMITTIVITY SENSORS FOR MULTIPHASE PETROLEUM FLOW APPLICATIONS**

Jan Kocbach, Kjetil Haukalid, Kjetil Folgerø  
*Christian Michelsen Research, Norway*

### **INTEGRATION OF MULTIPLE SENSORS FOR VEGETATION MONITORING IN ALPINE AREAS**

Andrea Vilardi, Abraham Mejia-Aguilar, Claudia Notarnicola, Enrico Tomelleri, Roberto Monsorno, Marc Zebisch  
*EURAC-Institute for Applied Remote Sensing, Italy*

### **DISCRIMINATION OF PERFUMES BY ELECTRONIC NOSE USING DESORPTION RATE CONSTANTS**

Juan Vorobioff, Carlos Rinaldi, Norberto Boggio, Daniel Rodriguez  
*CNEA, Argentina*

### **CMOS IMAGE SENSOR WITH 4.9DB SNR IMPROVEMENT AT LOW LIGHT CONDITION**

Dongsoo Kim, Jian Jang, Hwayoung Kang, Youngkwon Yoon  
*Samsung Electronics, South Korea*

### **OPTIMUM CONDITION FOR IDENTIFICATION OF ALCOHOLIC GASES BY SEMICONDUCTOR GAS SENSOR**

Akira Fujimoto  
*National Institute of Technology, Wakayama College, Japan*

### **IMPLANTABLE SENSOR FOR LIVESTOCK TRACEABILITY AND INFECTIOUS DISEASE PREVENTION**

Young-Han Kim, Hyun-Seok Ahn, Yongseok Lim, Yongju Park, Seung-Ok Lim  
*Korea Electronics Technology Institute (KETI), South Korea*

### **DETECTION OF PASSING AUTOMOBILE SOUND FOR SOUND MAPS**

Itaru Usami<sup>1</sup>, Niwat Thepvilojanapong<sup>2</sup>, Naofumi Kitsunezaki<sup>1</sup>, Yoshito Tobe<sup>1</sup>  
<sup>1</sup>*Aoyama Gakuin University, Japan;* <sup>2</sup>*Mie University, Japan*

### **OXYGEN SENSOR USING MULTI-MODE GRADED-INDEX OPTICAL SILICA FIBER BASED ON RU COMPLEX EMBEDDED IN LAYER-BY-LAYER THIN FILM**

Sayuri Ban, Ai Hosoki, Michiko Nishiyama, Atsushi Seki, Kazuhiro Watanabe  
*Soka University, Japan*

### **SIGNAL DETECTION METHOD WITH CARRIER TRACKING LOOP FOR MOVEMENT TARGETS ON INDOOR POSITIONING SYSTEM WITH SPREAD SPECTRUM ULTRASONIC WAVES**

Shohei Terao<sup>2</sup>, Akimasa Suzuki<sup>1</sup>, Taketoshi Iyota<sup>2</sup>  
<sup>1</sup>*Iwate Prefectural University, Japan;* <sup>2</sup>*Soka University, Japan*

### **MATERIAL AND ELECTRICAL PROPERTIES OF CR<sub>2</sub>O<sub>3</sub> DOPE Y<sub>0.2</sub>AL<sub>0.1</sub>MN<sub>0.27</sub>FE<sub>0.16</sub>NI<sub>0.27</sub>OX FOR CERAMIC THERMISTOR**

Woonyoung Lee, Jinseong Park  
*Chosun University, South Korea*

### **HETERO-CORE STRUCTURED FABRY-PEROT FIBER OPTIC HYDROGEN SENSOR WITH PALLADIUM FILM**

Michiko Nishiyama<sup>2</sup>, Ai Hosoki<sup>2</sup>, Hiroataka Igawa<sup>1</sup>, Kazuhiro Watanabe<sup>2</sup>, Atushi Seki<sup>2</sup>  
<sup>1</sup>*Japan Aerospace Exploration Agency, Japan;* <sup>2</sup>*Soka University, Japan*

### **MULTISPECTRAL INFRARED SENSOR FOR MARTIAN ATMOSPHERIC PARAMETERS RETRIEVAL**

Alberto Fernández, Francisco Cortés, Fernando López  
*Universidad Carlos III de Madrid, Spain*

### **SENSORIAL STEEL: IN-SITU MEASUREMENT OF STRAINS AND TEMPERATURES DURING GRINDING BY WORKPIECE INTEGRATED THIN FILM SENSORS**

Gerrit Dumstorff<sup>2</sup>, Benjamin Kolkwitz<sup>1</sup>, Mridusmita Sarma<sup>2</sup>, Carsten Heinzel<sup>1</sup>, Walter Lang<sup>2</sup>  
<sup>1</sup>*Foundation Institute of Materials Science (IWT) Bremen, Germany;* <sup>2</sup>*Institute of Microsensors, -actuators, and -systems (IMSAS), Germany*

### **HYDROTHERMAL SYNTHESIS OF ZNO NANORODS FOR SCHOTTKY DIODE HYDROGEN GAS SENSOR**

Yuan Liu, Jerry Yu, P.T. Lai  
*The University of Hong Kong, Hong Kong*

### **RADIATION MONITORING USING A SMART PHONE FOLLOWING THE FUKUSHIMA DISASTER**

Naoto Bando<sup>2</sup>, Atsushi Yamamoto<sup>1</sup>, Peter Debarber<sup>1</sup>  
<sup>1</sup>*Horiba Instruments, Inc., United States;* <sup>2</sup>*Horiba, Ltd., Japan*

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

Casper Clausen, Anders Bentien  
*Aarhus University, Denmark*

### **REDOX CHEMO-CHROMIC SENSORS FOR DETECTING BLOOD GLUCOSE LEVELS IN DIABETICS**

Rakesh Nair, Akhil Moorthi  
*Technical University of Chemnitz, Germany*

### **DEVELOPMENT OF WEARABLE MOBILE DEVICE USING BIO-SENSORS**

Yongkwi Lee, Hyunjin Yoon, Sangwook Park, Mikyung Han, Jong-Hyun Jang  
*ETRI, South Korea*

### **OPTICAL FIBER REFRACTOMETRIC SENSOR WITH ELLIPSOIDAL DETECTION ELEMENT IN REFLECTION MODE**

Sergei Khotiaintsev, Amalia Nallely Castro Martínez, María Del Carmen López Bautista, Selene Pérez García, Juan Emmanuel González Tinoco  
*Universidad Nacional Autónoma de México, Mexico*

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16:30 – 18:00

**B4L-A: SPECIAL SESSION: ELECTRONIC NOSES**

Auditorium 1

Session Chair: Maria Carmen Horrillo Güemes (CSIC, Spain)

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16:30

**MONITORING HOUSEHOLD GARBAGE ODORS IN URBAN AREAS THROUGH DISTRIBUTION MAPS.....1364**

Javier G. Monroy, Javier Gonzalez-Jimenez, Carlos Sanchez-Garrido  
*Universidad de Málaga, Spain*

17:00

**THRESHOLD DETECTION OF CARCINOGENIC ODOR OF FORMALDEHYDE WITH WIRELESS ELECTRONIC NOSE .....1368**

Muhammad Hassan, Amine Bermak  
*Hong Kong University of Science and Technology, Hong Kong*

17:15

**AN INVESTIGATION ABOUT THE ORIGIN OF THE LUNG CANCER SIGNALLING VOCS IN BREATH .....1372**

Rosamaria Capuano<sup>2</sup>, Eugenio Martinelli<sup>2</sup>, Silvia Ghezzi<sup>2</sup>, Roberto Paolesse<sup>2</sup>, Corrado Di Natale<sup>2</sup>, Arnaldo D'Amico<sup>2</sup>, Marco Santonico<sup>2</sup>, Giorgio Pennazza<sup>1</sup>  
<sup>1</sup>*Università Campus Bio-Medico di Roma, Italy*; <sup>2</sup>*Università degli Studi di Roma Tor Vergata, Italy*

17:30

**MOX-NW ELECTRONIC NOSE FOR DETECTION OF FOOD MICROBIAL CONTAMINATION .....1376**

Giorgio Sberveglieri<sup>1</sup>, Giulia Zambotti<sup>1</sup>, Matteo Falasconi<sup>1</sup>, Emanuela Gobbi<sup>1</sup>, Veronica Sberveglieri<sup>2</sup>  
<sup>1</sup>*Università degli Studi di Brescia, Italy*; <sup>2</sup>*Università degli Studi di Modena e Reggio Emilia & Consiglio Nazionale delle Ricerche / Istituto Naz, Italy*

17:45

**LOVE WAVE-BASED ACOUSTIC COMPONENTS AS VERSATILE SENSORS FOR ELECTRONIC NOSE OR TONGUE. APPLICATION TO CANCER MONITORING .....1380**

Naima Lebal<sup>1</sup>, Vincent Raimbault<sup>1</sup>, Hamida Hallil<sup>1</sup>, Bernard Plano<sup>1</sup>, Jean Luc Lachaud<sup>1</sup>, Corinne Dejous<sup>1</sup>, Dominique Rebière<sup>1</sup>, Aleksandra Krstulja<sup>2</sup>, Raphael Delepée<sup>2</sup>, Luigi Agrofoglio<sup>2</sup>  
<sup>1</sup>*Université Bordeaux 1, France*; <sup>2</sup>*University of Orleans, France*

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16:30 - 18:00

**B4L-B: PHOTONIC CRYSTALS AND NANOSTRUCTURES**

Auditorium 2

Session Chairs: Marco Petrovich (University of Southampton, England), Ralf Lucklum (Otto von Guericke Universitaet, Germany)

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16:30

**NANOIMPRINTED DISTRIBUTED FEEDBACK DYE LASER SENSOR FOR REAL-TIME IMAGING OF SMALL MOLECULE DIFFUSION.....1384**

Christoph Vannahme, Martin Dufva, Anders Kristensen  
*Technical University of Denmark, Denmark*

**16:45**  
**FABRICATION OF AU-DECORATED 3D ZNO NANOSTRUCTURES AS RECYCLABLE SERS SUBSTRATES.....1387**

Sung-Gyu Park<sup>2</sup>, Jung-Dae Kwon<sup>2</sup>, Chae-Won Mun<sup>2</sup>, Byungjin Cho<sup>2</sup>, Chang Su Kim<sup>2</sup>, Myungkwan Song<sup>2</sup>, Dong-Ho Kim<sup>2</sup>, Tae Yoon Jeon<sup>1</sup>, Hwan Chul Jeon<sup>1</sup>

<sup>1</sup>Korea Advanced Institute of Science and Technology, South Korea; <sup>2</sup>Korea Institute of Materials Science, South Korea

**17:00**  
**EFFECT OF ROUNDING ON THE SENSITIVITY OF OPTICAL ANTENNAS BASED SENSORS.....1391**

Bhaven Mehta, Mona Zaghloul  
George Washington University, United States

**17:15**  
**CAPILLARY OPTOFLUIDICS BY HIGH-ASPECT-RATIO PHOTONIC CRYSTALS .....1395**

Salvatore Surdo<sup>2</sup>, Lucanos Strambini<sup>2</sup>, Giuseppe Barillaro<sup>2</sup>, Francesca Carpignano<sup>1</sup>, Sabina Merlo<sup>1</sup>

<sup>1</sup>Università degli Studi di Pavia, Italy; <sup>2</sup>Università di Pisa, Italy

**17:30**  
**ACCURATE WAVELENGTH PREDICTION OF PHOTONIC CRYSTAL RESONANT REFLECTION AND APPLICATIONS IN REFRACTIVE INDEX MEASUREMENT .....1399**

Pétur Gordon Hermannsson, Christoph Vannahme, Cameron L.C. Smith, Anders Kristensen  
Technical University of Denmark, Denmark

**17:45**  
**STEERING WHEEL PHOTONIC CRYSTAL FIBER FOR HUMAN IGG DETECTION .....1403**

Jad Rabah, Alpha Mansaray, Rosalind Wynne, Metin Duran  
Villanova University, United States

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**16:30 - 18:00**  
**B4L-C: TRACE DETECTION IN SECURITY AND MEDICAL APPLICATIONS**  
**Auditorium 3A**  
**Session Chair: Eduard Llobet (Universitat Rovira i Virgili, Spain)**

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**16:30**  
**EXPLOSIVES DETECTION BY ARRAY OF SI  $\mu$ -CANTILEVERS COATED WITH TITANOSILICATE TYPE NANOPOROUS MATERIALS .....1407**

Maria Pilar Pina, Fernando Almazán, Adela Eguizábal, Ismael Pellejero, Miguel Urbiztondo, Javier Sesé, Jesús Santamaría, Daniel García-Romeo, Belen Calvo, Nicolás Medrano  
Universidad de Zaragoza, Spain

**16:45**  
**MOX/SAW E-NOSE FOR THE IDENTIFICATION OF NERVE AGENT SIMULANT IN THE PRESENCE OF DIESEL.....1415**

Harpreet Singh, V. Bhasker Raj, Jitender Kumar, Upendra Mittal, Meena Mishra, Archibald Theodore Nimal, Manoj Umesh Sharma, Vinay Gupta  
University of Delhi, India

**17:00**  
**CONJUGATED POLYMER-BASED EXPLOSIVES SENSOR: PROGRESSES IN THE DESIGN OF A HANDHELD DEVICE.....1415**

Tiago Neves, Lino Marques, Liliana Martelo, Hugh Burrows  
University of Coimbra, Portugal



17:15

**PORTABLE LOCK-IN AMPLIFIER FOR MICROCANTILEVER BASED SENSOR ARRAY. APPLICATION TO EXPLOSIVES DETECTION USING CO-BEA TYPE ZEOLITES AS SENSING MATERIALS.....1419**

Daniel García-Romeo, Belén Calvo, Nicolás Medrano, María Pilar Pina, Fernando Almazán, Ismael Pellejero, Miguel Urbiztondo, Javier Sesé, Jesús Santamaría  
*Universidad de Zaragoza, Spain*

17:30

**STABLE AND REUSABLE ELECTROCHEMICAL SENSOR FOR CONTINUOUS MONITORING OF PHOSPHATE IN WATER .....1423**

Leo Huan-Hsuan Hsu, Ravi Selvaganapathy  
*McMaster University, Canada*

17:45

**MONITORING OF DISEASE-RELATED VOLATILE ORGANIC COMPOUNDS IN SIMULATED ROOM AIR .....1427**

Toshio Itoh<sup>2</sup>, Takafumi Akamatsu<sup>2</sup>, Noriya Izu<sup>2</sup>, Woosuck Shin<sup>2</sup>, Hyung-Gi Byun<sup>1</sup>  
<sup>1</sup>Kangwon National University, South Korea; <sup>2</sup>National Institute of Advanced Industrial Science and Technology, Japan

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16:30 - 18:00

**B4L-D: SAFETY AND SECURITY APPLICATIONS I**

**Auditorium 3B**

**Session Chairs: Omer Oralkan (North Carolina State University, USA), Giuseppe Barillaro (University of Pisa, Italy)**

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16:30

**GAS-DRONE: PORTABLE GAS SENSING SYSTEM ON UAVS FOR GAS LEAKAGE LOCALIZATION .....1431**

Maurizio Rossi<sup>2</sup>, Davide Brunelli<sup>2</sup>, Andrea Adami<sup>1</sup>, Leandro Lorenzelli<sup>1</sup>, Fabio Menna<sup>1</sup>, Fabio Remondino<sup>1</sup>  
<sup>1</sup>Fondazione Bruno Kessler, Italy; <sup>2</sup>Università degli Studi di Trento, Italy

16:45

**ARTIFICIAL OLFACTION TOOL AND TECHNIQUES FOR SAFETY CONTROLS IN AEROSPACE ASSEMBLY AND MAINTENANCE .....1435**

Saverio De Vito, Maria Salvato, Ettore Massera, Antonio Buonanno, Mara Miglietta, Grazia Fattoruso, Girolamo Di Francia  
*Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy*

17:00

**A CMOS DIGITIZED SALINITY TRANSDUCER WITH CALIBRATION CIRCUITS FOR MONITORING SALINITY OF OCEAN ENVIRONMENT AND AQUACULTURE.....1439**

Cheng-Ta Chiang, Che-Wei Chang  
*National Chiayi University, Taiwan*

17:15

**APPLICATION OF MEMS TO MONITORING SYSTEM FOR NATURAL DISASTER REDUCTION .....1443**

Nao Minakata<sup>2</sup>, Satoshi Nishiyama<sup>3</sup>, Takao Yano<sup>2</sup>, Meiji Ryu<sup>1</sup>  
<sup>1</sup>Earthtech Toyo Co.,Ltd, Japan; <sup>2</sup>Kyoto University, Japan; <sup>3</sup>Okayama University, Japan

17:30

**MARINE MONITORING USING OPTICAL FIBER-BASED SENSING SYSTEM.....1445**

Giuseppe Griffo, Aimé Lay-Ekuakille, Patrizia Vergallo, Luigi Piper, Fabrizio Spano, Alessandro Massaro, Giuseppe Gigli  
*Università del Salento, Italy*

17:45

**SMART METER LED PROBE FOR REAL-TIME APPLIANCE LOAD MONITORING .....1451**

Paolo Barsocchi<sup>1</sup>, Erina Ferro<sup>1</sup>, Filippo Palumbo<sup>2</sup>, Francesco Potorti<sup>1</sup>

<sup>1</sup>Consiglio Nazionale delle Ricerche, Italy; <sup>2</sup>Università degli Studi di Pisa / Consiglio Nazionale delle Ricerche, Italy

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16:30 - 18:00

**B4L-E: MONOLITHIC AND CMOS SENSORS**

Rooms 1 & 2

Session Chairs: Siavash Pourkamali (University of Texas at Dallas, USA), Ajit Sharma (Texas Instruments, USA)

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16:30

**A BRIDGE-TYPE RESISTIVE TEMPERATURE SENSOR IN CMOS TECHNOLOGY WITH LOW STRESS SENSITIVITY .....1455**

Samuel Huber<sup>2</sup>, Arnaud Laville<sup>2</sup>, Christian Schott<sup>2</sup>, Oliver Paul<sup>1</sup>

<sup>1</sup>Albert-Ludwigs-Universität Freiburg, Germany; <sup>2</sup>Melexis Technologies SA, Switzerland

16:45

**A CMOS INTERDIGITAL CAPACITIVE HUMIDITY SENSOR ENHANCED BY A MULTI-LAYERED STRUCTURE .....1459**

Jian-Qiu Huang, Wen-Hao Chen, Dong-Ping Zhu, Lei Han

Southeast University, China

17:00

**AN INLINE INSERTION MICROWAVE MEMS POWER SENSOR BASED ON GAAS MMIC TECHNOLOGY WITH ULTRA REFLECTION LOSSES .....1463**

Zhiqiang Zhang, Xiaoping Liao

Southeast University, China

17:15

**A 0.18- $\mu$ M CMOS CURRENT-MODE HALL MAGNETIC SENSOR WITH VERY LOW BIAS CURRENT AND HIGH SENSITIVE FRONT-END .....1467**

Hadi Heidari, Edoardo Bonizzoni, Umberto Gatti, Franco Maloberti

Università degli Studi di Pavia, Italy

17:30

**CMOS IMPLEMENTATION OF A 3-AXIS THERMAL CONVECTIVE ACCELEROMETER .....1471**

Frederick Mailly, Huy Binh Nguyen, Laurent Latorre, Pascal Nouet

Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier, France

17:45

**A TUNGSTEN BASED SOI CMOS MEMS WALL SHEAR STRESS SENSOR .....1475**

Ibraheem Haneef<sup>1</sup>, Muhammad Umer<sup>1</sup>, Mohtashim Mansoor<sup>1</sup>, Suhail Akhtar<sup>1</sup>, Muhammad Aftab Rafiq<sup>3</sup>, Syed Zeeshan Ali<sup>2</sup>, Florin Udrea<sup>4</sup>

<sup>1</sup>Air University, Pakistan; <sup>2</sup>Cambridge CMOS Sensors Ltd, United Kingdom; <sup>3</sup>Pakistan Institute of Engineering and Applied Sciences, Pakistan; <sup>4</sup>University of Cambridge, United Kingdom

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16:30 - 17:45

**B4L-F: PHOTONIC AND ACOUSTIC BIOSENSORS**

Rooms 3 & 4

**Session Chair: Stefan Rupitsch (Erlangen University, Germany)**

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**16:30**

**ENHANCED FLUORESCENCE THROUGH THE INCORPORATION OF NANOCONES/GAPS INTO A PLASMONIC GRATINGS SENSOR PLATFORM ..... 1479**

Aaron Wood, Sheila Grant, Sagnik Basuray, Avinash Pathak, Sangho Bok, Cherian Mathai, Keshab Gangopadhyay, Shubhra Gangopadhyay  
*University of Missouri, USA*

**16:45**

**BIOMARKER QUANTIFICATION AT CLINICALLY RELEVANT CONCENTRATIONS USING METAL ENHANCED FLUORESCENCE COMBINED WITH SURFACE ACOUSTIC WAVES ..... 1483**

Samuel Morrill, Venkat Bhethanabotla, Mandek Richardson  
*University of South Florida, USA*

**17:00**

**SEPARATION AND SENSING OF WHOLE CELLS USING METAMATERIAL MESH SENSOR WITH PERIODIC MICROSTRUCTURES ..... 1487**

Makoto Hasegawa<sup>3</sup>, Kosuke Mori<sup>3</sup>, Yasuyo Inagaki<sup>3</sup>, Koki Yamamoto<sup>3</sup>, Nobuaki Shirai<sup>4</sup>, Yuichi Ogawa<sup>1</sup>, Seiji Kamba<sup>2</sup>, Takashi Kondo<sup>2</sup>  
<sup>1</sup>*Kyoto University, Japan*; <sup>2</sup>*Murata Manufacturing Company, Japan*; <sup>3</sup>*Nagahama Institute of Bio-Science and Technology, Japan*; <sup>4</sup>*Northeastern Industrial Research Center of Shiga Prefecture, Japan*

**17:15**

**RESPONSE ANALYSIS OF ODOR SENSOR BASED UPON INSECT OLFACTORY RECEPTORS USING IMAGE PROCESSING METHOD ..... 1491**

Takamichi Nakamoto<sup>1</sup>, Miki Kakizaki<sup>1</sup>, Yoshinori Suzuki<sup>1</sup>, Hidefumi Mitsuno<sup>2</sup>, Ryohei Kanzaki<sup>2</sup>  
<sup>1</sup>*Tokyo Institute of Technology, Japan*; <sup>2</sup>*University of Tokyo, Japan*

**17:30**

**THIN-FILM AMORPHOUS SILICON PHOTODIODES WITH INTEGRATED FLUORESCENT FILTERS FOR MONITORING LIVE-CELL GPROTEIN COUPLED RECEPTORS (GPCR) ..... 1495**

Sofia Martins<sup>2</sup>, João Mateus<sup>1</sup>, Virginia Chu<sup>1</sup>, Miguel Prazeres<sup>2</sup>, João Pedro Conde<sup>3</sup>  
<sup>1</sup>*INESC Microsistemas e Nanotecnologias, Portugal*; <sup>2</sup>*Instituto Superior Técnico, Portugal*; <sup>3</sup>*Universidade de Lisboa, Portugal*

## WEDNESDAY, NOVEMBER 5TH

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9:00 - 9:50

**KEYNOTE – JUN OHTA**

Auditorium 1

Session Chair: Ignacio R. Matías (Public University of Navarra, Spain)

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9:00

**COMMUNICATION WITH CELLS BY ELECTRICITY AND LIGHT – IMPLANTABLE  
MICROELECTRONICS DEVICES**

Jun Ohta

*Nara Institute of Science and Technology, Japan*

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10:00 - 11:30

**C1L-A: SPECIAL SESSION: BATTERY-LESS RF-ENABLED SENSORS FOR WIRELESS SENSOR NETWORKS**

Auditorium 1

Session Chair: Roc Berenguer (CEIT and Tecnun, University of Navarra, Spain)

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10:00

**INVITED TALK: BATTERY-FREE WIRELESS SENSORS FOR INDUSTRIAL APPLICATIONS BASED ON UHF  
RFID TECHNOLOGY ..... 1499**

Ibon Zalbide<sup>1</sup>, Eduardo D'Entremont<sup>1</sup>, Ainara Jiménez<sup>1</sup>, Héctor Solar<sup>2</sup>, Andoni Beriain<sup>2</sup>, Roc Berenguer<sup>2</sup>

<sup>1</sup>Farsens SL, Spain; <sup>2</sup>Universidad Pública de Navarra, Spain

10:30

**SENSING OF THERMAL THRESHOLDS USING UWB RFID PASSIVE TAGS..... 1503**

Angel Ramos, Antonio Lazaro, Ramon Villarino, David Girbau

*Universitat Rovira i Virgili, Spain*

10:45

**AN RFID-ENABLED INKJET-PRINTED SOIL MOISTURE SENSOR ON PAPER FOR "SMART"  
AGRICULTURAL APPLICATIONS ..... 1507**

Sangkil Kim<sup>3</sup>, Taoran Le<sup>3</sup>, Manos Tentzeris<sup>3</sup>, Amal Harrabi<sup>2</sup>, Ana Collado<sup>1</sup>, Apostolos Georgiadis<sup>1</sup>

<sup>1</sup>Centre Tecnologic de Telecomunicacions de Catalunya, Spain; <sup>2</sup>Faculty of Mathematical, Physical and Natural Sciences of Tunis, Tunisia; <sup>3</sup>Georgia Institute of Technology, USA

11:00

**PASSIVE SENSORS FOR FOOD QUALITY MONITORING AND COUNTERFEITING ..... 1511**

Ricardo Goncalves<sup>2</sup>, Jimmy Hester<sup>1</sup>, Nuno Carvalho<sup>2</sup>, Pedro Pinho<sup>2</sup>, Manos Tentzeris<sup>1</sup>

<sup>1</sup>Georgia Institute of Technology, USA; <sup>2</sup>Instituto de Telecomunicacoes, Portugal

11:15

**MULTI-BAND SIMULTANEOUS INDUCTIVE WIRELESS POWER AND DATA TRANSMISSION ..... 1515**

Tobias Dräger, Iker Mayordomo, Jochen Schuster

*Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, Germany*

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10:00 - 11:30

**C1L-B: OPTICAL FIBER SENSORS II**

Auditorium 2

Session Chairs: Marco Petrovich (University of Southampton, England), Carlos Ruiz Zamarreño (Public University of Navarra, Spain)

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10:00

**FIBER OPTIC TEMPERATURE SENSOR BASED ON IMAGE PROCESSING OF INTERMODAL INTERFERENCE PATTERN.....1519**

Frederic Musin, Patrice Mégret, Marc Wuilpart  
*Université de Mons, Belgium*

10:15

**TORSION SENSOR WITH AN YB-DOPED PHOTONIC CRYSTAL FIBER BASED ON A MACH-ZEHNDER INTERFEROMETER .....1523**

Juan Sierra-Hernandez<sup>2</sup>, Julián Estudillo-Ayala<sup>2</sup>, Daniel Jauregui-Vazquez<sup>2</sup>, Roberto Rojas-Laguna<sup>2</sup>, Roberto Robledo-Fava<sup>1</sup>, Arturo Castillo-Guzman<sup>1</sup>, Romeo Selvas-Aguilar<sup>1</sup>, Everardo Vargas-Rodriguez<sup>2</sup>, Eloisa Gallegos-Arellano<sup>2</sup>  
<sup>1</sup>*Universidad Autónoma de Nuevo León, Mexico;* <sup>2</sup>*Universidad de Guanajuato, Mexico*

10:30

**SIMPLE AND ADJUSTABLE FABRICATION PROCESS FOR GRADED-INDEX POLYMER OPTICAL FIBERS WITH TAILORED PROPERTIES FOR SENSING.....1527**

Christian-Alexander Bunge<sup>1</sup>, Markus Beckers<sup>2</sup>, Thomas Gries<sup>2</sup>  
<sup>1</sup>*Hochschule für Telekommunikation Leipzig, Germany;* <sup>2</sup>*Rheinisch-Westfälische Technische Hochschule Aachen, Germany*

10:45

**NEW TOPOLOGIES FOR FIBER LASER NON-CONTACT VIBROMETERS .....1531**

David A. Jackson<sup>2</sup>, Julio E. Posada-Roman<sup>1</sup>, Jose A. Garcia-Souto<sup>1</sup>  
<sup>1</sup>*Universidad Carlos III de Madrid, Spain;* <sup>2</sup>*University of Kent, United Kingdom*

11:00

**FIBER BRAGG GRATINGS FOR DISTRIBUTED CRYOGENIC TEMPERATURE MEASUREMENT IN A TUBE IN TUBE HELICALLY COILED HEAT EXCHANGER .....1535**

Viswanath Kumar Bharathwaj<sup>2</sup>, Akshit Markan<sup>1</sup>, Milind Atrey<sup>1</sup>, Holger Neumann<sup>2</sup>, Rajinikumar Ramalingam<sup>2</sup>  
<sup>1</sup>*Indian Institute of Technology Bombay, India;* <sup>2</sup>*Karlsruher Institut für Technologie, Germany*

11:15

**AUTOMATIC STRAIN DETECTION IN A BRILLOUIN OPTICAL TIME DOMAIN SENSOR USING PRINCIPAL COMPONENT ANALYSIS AND ARTIFICIAL NEURAL NETWORKS .....1539**

Ruben Ruiz Lombera, Jesus Mirapeix Serrano, José Miguel López-Higuera  
*Universidad de Cantabria, Spain*

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10:00 - 11:30

**C1L-C: DEVICES AND SIGNALS**

Auditorium 3A

Session Chair: José L. Sanchez de Rojas (Universidad Castilla-La Mancha, Spain)

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10:00

**DIELECTRIC AND INDUCTIVE SENSING USING FRINGING ELECTROMAGNETIC FIELDS FROM TEMPERATURE-STABILIZED LC OSCILLATORS .....1543**

Nathaniel Gaskin, Richard Brown  
*University of Utah, USA*

**10:15**  
**INSTRUMENTATION TO INVESTIGATE THE MAGNETORECEPTION OF HOMING PIGEONS BY USING APPLIED MAGNETIC FIELDS.....1547**

Noor Aldoumani, Tomasz Kutrowski, John Barnes, Turgut Meydan, Jonathan Erichsen  
*Cardiff University, United Kingdom*

**10:30**  
**REMOLDABLE INDUCTORS BASED ON SELF-HEATING FUSIBLE ALLOYS.....1551**

Nathan Lazarus, Sarah Bedair, Chris Meyer  
*U.S. Army Research Laboratory, USA*

**10:45**  
**ATTOFARAD-LEVEL CAPACITANCE VARIATION DETECTOR USES RF-SENSOR WITH 98/100 MHZ OSCILLATOR/LOCAL SUPERHETERODYNE SCHEME FOR WIRELESS PEST SENSOR .....1555**

Hisashi Nishikawa, Takaki Matsumoto, Ami Tanaka, Takakuni Douseki  
*Ritsumeikan University, Japan*

**11:00**  
**A CROSSTALK ERROR CORRECTION ALGORITHM FOR CAPACITIVE SENSOR PANELS.....1559**

Ramon Tortosa<sup>2</sup>, Javier Calpe-Maravilla<sup>2</sup>, John Cleary<sup>1</sup>  
<sup>1</sup>*Analog Devices, Ireland;* <sup>2</sup>*Analog Devices Inc., Spain*

**11:15**  
**FIBER-REINFORCED COMPOSITE STRUCTURES WITH EMBEDDED PIEZOELECTRIC SENSORS.....1563**

Robert Schulze<sup>3</sup>, Petra Streit<sup>2</sup>, Thomas Fischer<sup>2</sup>, Alexander Tsapkolenko<sup>2</sup>, Michael Heinrich<sup>2</sup>, Martynas Sborikas<sup>1</sup>, Lothar Kroll<sup>2</sup>, Thomas Gessner<sup>3</sup>, Michael Wegener<sup>1</sup>  
<sup>1</sup>*Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, Germany;* <sup>2</sup>*Technische Universität Chemnitz, Germany;* <sup>3</sup>*Technische Universität Chemnitz and Fraunhofer Institute for Electronic Nano Systems, Germany*

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**10:00 - 11:30**

**C1L-D: SENSING PLATFORMS**

**Auditorium 3B**

**Session Chairs: Vittorio Ferrari (University of Brescia, Italy), Troy Nagle (North Carolina State University, USA)**

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**10:00**  
**DESIGN OF A QUASI-CHIPLESS HARMONIC RADAR SENSOR FOR AMBIENT TEMPERATURE SENSING .....1567**

Bernd Kubina, Jordi Romeu, Christian Mandel, Martin Schüßler, Rolf Jakoby  
*Technische Universität Darmstadt, Germany*

**10:15**  
**ENERGY AUTONOMOUS WIRELESS FILLING DETECTOR.....1571**

Risang Yudanto<sup>1</sup>, Riccardo Carta<sup>1</sup>, Frederik Petre<sup>1</sup>, Victor Van Acht<sup>2</sup>, Marc Tutelaers<sup>2</sup>, Sebren Schaafsma<sup>2</sup>, Koen Maertens<sup>3</sup>  
<sup>1</sup>*Flanders' Mechatronics Technology Centre, Belgium;* <sup>2</sup>*Holst Centre/IMEC, Netherlands;* <sup>3</sup>*PicoCal Inc., Belgium*

**10:30**  
**SELF-POWERED HEAT-SINK SOC AS TEMPERATURE SENSORS WITH WIRELESS INTERFACE: DESIGN AND VALIDATION .....1575**

Luca Rizzon, Maurizio Rossi, Roberto Passerone, Davide Brunelli  
*Università degli Studi di Trento, Italy*

**10:45**  
**CMOS-INTEGRATED PHOTODETECTORS FOR NEUROMORPHIC AND SMART IMAGING APPLICATIONS: A LOW-COST DESIGN AND MEASUREMENT METHOD.....1579**  
Nikola Katic, Alexandre Schmid, Yusuf Leblebici  
*École Polytechnique Fédérale de Lausanne, Switzerland*

**11:00**  
**A WIRELESS SENSOR NODE POWERED BY NONLINEAR ENERGY HARVESTER.....1583**  
Bruno Andò<sup>2</sup>, Salvatore Baglio<sup>2</sup>, Vincenzo Marletta<sup>2</sup>, Adi Ratan Bulsara<sup>1</sup>  
<sup>1</sup>*U.S. Navy Space and Naval Warfare Systems, USA;* <sup>2</sup>*Università degli Studi di Catania, Italy*

**11:15**  
**LOW FREQUENCY RADIO SIGNAL POLARISATION SENSOR WITH APPLICATIONS IN ATTITUDE ESTIMATION.....1587**  
Sean Maguire, Paul Robertson  
*University of Cambridge, United Kingdom*

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**10:00 - 11:30**  
**C1L-E: POSITIONING AND INERTIAL SENSORS**  
**Rooms 1 & 2**  
**Session Chair: Eugene Hwang (Analog Devices, Inc., USA)**

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**10:00**  
**A 1MG-TO-20G INTEGRATED MEMS INERTIAL SENSOR.....1591**  
Daisuke Yamane<sup>2</sup>, Toshifumi Konishi<sup>1</sup>, Takaaki Matsushima<sup>1</sup>, Hiroshi Toshiyoshi<sup>3</sup>, Kazuya Masu<sup>2</sup>, Katsuyuki Machida<sup>1</sup>  
<sup>1</sup>*NTT Advanced Technology Corporation, Japan;* <sup>2</sup>*Tokyo Institute of Technology, Japan;* <sup>3</sup>*University of Tokyo, Japan*

**10:15**  
**DEVELOPMENT OF A MEMS ROTATION SENSOR FOR OILFIELD APPLICATIONS .....1595**  
Maxime Projetti<sup>3</sup>, Olivier Vancauwenberghe<sup>3</sup>, Hans Paulson<sup>3</sup>, Nicolas Goujon<sup>3</sup>, Frederic Marty<sup>2</sup>, Denis Aubry<sup>1</sup>  
<sup>1</sup>*Ecole Centrale Paris, France;* <sup>2</sup>*ESIEE, France;* <sup>3</sup>*Schlumberger Limited, Norway*

**10:30**  
**A SELF-LEVELLING NANO-G SILICON SEISMOMETER .....1599**  
William Pike<sup>1</sup>, Aifric Delahunty<sup>1</sup>, Anisha Mukherjee<sup>1</sup>, Guangbin Dou<sup>1</sup>, Huafeng Liu<sup>1</sup>, Simon Calcutt<sup>3</sup>, Ian Standley<sup>2</sup>  
<sup>1</sup>*Imperial College London, United Kingdom;* <sup>2</sup>*Kinematics Inc., USA;* <sup>3</sup>*University of Oxford, United Kingdom*

**10:45**  
**TWO-DEGREE OF FREEDOM CAPACITIVE MEMS VELOCITY SENSOR WITH TWO COUPLED ELECTRICALLY ISOLATED MASS-SPRING-DAMPER SYSTEMS .....1603**  
Ali Alshehri<sup>3</sup>, Bader Almutairi<sup>3</sup>, Paolo Gardonio<sup>1</sup>, Michael Kraft<sup>2</sup>  
<sup>1</sup>*Università degli Studi di Udine, Italy;* <sup>2</sup>*Universität Duisburg-Essen, Germany;* <sup>3</sup>*University of Southampton, United Kingdom*

**11:00**  
**A NOVEL AND COMPATIBLE SENSING COIL FOR A CAPSULE IN WIRELESS CAPSULE ENDOSCOPY FOR REAL TIME LOCALIZATION.....1607**  
Mohd Noor Islam, Andrew Fleming  
*University of Newcastle, Australia*

**11:15**  
**DESIGN, FABRICATION AND CHARACTERIZATION OF A MICRO-MACHINED GRAVITY GRADIOMETER SUSPENSION** .....1611  
Huafeng Liu, William Pike, Guangbin Dou  
*Imperial College London, United Kingdom*

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**10:00 - 11:15**  
**C1L-F: MECHANICAL BIOSENSORS**  
**Rooms 3 & 4**  
**Session Chairs: Omer Oralkan (North Carolina State University, USA), Carlos Calaza (IMB-CNM (CSIC), Spain)**

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**10:00**  
**A NOVEL SELF-SUPPORTED PRINTED FLEXIBLE STRAIN SENSOR FOR MONITORING BODY MOVEMENT AND TEMPERATURE**.....1615  
Ali Eshkeiti, Michael Joyce, Binu Baby Narakathu, Sepehr Emamian, Sai Guruva Reddy Avathu, Margaret Joyce, Massood Zandi Atashbar  
*Western Michigan University, USA*

**10:15**  
**A MICROPLATFORM FOR MEASUREMENT OF CELL MECHANICAL PROPERTIES**.....1619  
Hao Tang, Zheyao Wang, Shouhong Jin, Qiong Wu  
*Tsinghua University, China*

**10:30**  
**MEASUREMENT OF SUB-BANDAGE PRESSURE DURING VENOUS COMPRESSION THERAPY USING FLEXIBLE FORCE SENSORS** .....1623  
Michael Burke, Bruce Murphy, Dermot Geraghty  
*Trinity College Dublin, Ireland*

**10:45**  
**INVESTIGATION ON NANOSTRUCTURED BIOSENSOR FOR BIOTIN DETECTION** .....1627  
Davide Polese<sup>1</sup>, Annalisa Convertino<sup>1</sup>, Luca Maiolo<sup>1</sup>, Andrea Ferrone<sup>1</sup>, Luca Pazzini<sup>1</sup>, Marco Marrani<sup>1</sup>, Francesco Maita<sup>1</sup>, Alessandro Pecora<sup>1</sup>, Guglielmo Fortunato<sup>1</sup>, Giorgia Fiaschi<sup>2</sup>  
<sup>1</sup>Consiglio Nazionale delle Ricerche, Italy; <sup>2</sup>Università degli Studi Roma Tre, Italy

**11:00**  
**WRIST ANGLE MEASUREMENTS USING SOFT SENSORS** .....1631  
Daniel Vogt, Robert Wood  
*Harvard University, USA*

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**12:00 - 13:45**  
**C2L-A: SPECIAL SESSION: ANALYTICAL & SEMI-NUMERICAL SENSOR MODELING**  
**Auditorium 1**  
**Session Chairs: Roman Beigelbeck (Danube University Krems, Austria), Bernhard Jakoby (Johannes Kepler University Linz, Austria)**

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**12:00**  
**INVITED TALK: FLUID-STRUCTURE INTERACTIONS OF MECHANICAL SENSORS AT NANOMETER SCALES** .....1635  
John Sader  
*University of Melbourne, Australia*



<b>12:30</b>	<b>REAL-TIME COMPOSITION DETERMINATION OF GAS MIXTURES.....</b>	<b>1640</b>
	Joost Lötters <sup>3</sup> , Egbert van der Wouden <sup>1</sup> , Jarno Groenesteijn <sup>2</sup> , Wouter Sparreboom <sup>1</sup> , Theo Lammerink <sup>2</sup> , Remco Wiegerink <sup>2</sup>	
	<sup>1</sup> Bronkhorst High-Tech BV, Netherlands; <sup>2</sup> Universiteit Twente, Netherlands; <sup>3</sup> Universiteit Twente & Bronkhorst High-Tech BV, Netherlands	
<b>12:45</b>	<b>DETERMINATION OF THERMAL PROPERTIES OF GASES UNDER FLOW CONDITIONS.....</b>	<b>1644</b>
	Diego Reyes-Romero, Ali Cubukcu, Gerald Urban	
	Albert-Ludwigs-Universität Freiburg, Germany	
<b>13:00</b>	<b>DEVELOPMENT OF ANALYTICAL MODELS OF T- AND U SHAPED CANTILEVER-BASED MEMS DEVICES FOR SENSING AND ENERGY HARVESTING APPLICATIONS .....</b>	<b>1648</b>
	Stephen Heinrich <sup>1</sup> , Mohand Tayeb Boudjiet <sup>2</sup> , Damien Thuau <sup>2</sup> , Philippe Poulin <sup>2</sup> , Cedric Ayéla <sup>2</sup> , Isabelle Dufour <sup>2</sup>	
	<sup>1</sup> Marquette University, USA; <sup>2</sup> Université Bordeaux 1, France	
<b>13:15</b>	<b>MODELING PERTURBATIONS INDUCED IN PLATE RESONATOR CHARACTERISTICS DUE TO FLEXURAL BENDING .....</b>	<b>1652</b>
	Gokhan Hatipoglu, Srinivas Tadigadapa	
	Pennsylvania State University, USA	
<b>13:30</b>	<b>EFFICIENT NUMERICAL SIMULATION OF TRANSDUCER OUTPUTS FOR ACOUSTIC MICROSCOPES .....</b>	<b>1656</b>
	Stefan Rupitsch, Michael Nierla	
	Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany	
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<b>12:00 - 13:30</b>	<b>C2L-B: PHOTODETECTORS I</b>	
	Auditorium 2	
	<b>Session Chairs: Nicola Massari (Fondazione Bruno Kessler, Italy), Rihito Kuroda (Tohoku University, Japan)</b>	
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<b>12:00</b>	<b>BACKSIDE ILLUMINATED CMOS IMAGE SENSORS FOR EXTREME ULTRAVIOLET APPLICATIONS.....</b>	<b>1660</b>
	Padmakumar R. Rao <sup>2</sup> , Christian Laubis <sup>1</sup> , Stoyan Nihtianov <sup>2</sup>	
	<sup>1</sup> Physikalisch-Technische Bundesanstalt, Germany; <sup>2</sup> Technische Universiteit Delft, Netherlands	
<b>12:15</b>	<b>HIGH QUANTUM EFFICIENCY 200-1000 NM SPECTRAL RESPONSE PHOTODIODES WITH ON-CHIP MULTIPLE HIGH TRANSMITTANCE OPTICAL LAYERS .....</b>	<b>1664</b>
	Yasumasa Koda, Rihito Kuroda, Shigetoshi Sugawa	
	Tohoku University, Japan	
<b>12:30</b>	<b>OPTIMIZATION OF PERIMETER GATED SPADS IN A STANDARD CMOS PROCESS .....</b>	<b>1668</b>
	Mohammad Habib, Farhan Quaiyum, Syed Islam, Nicole McFarlane	
	University of Tennessee, Knoxville, USA	

**12:45**  
**STACKED ORGANIC PHOTOCONDUCTIVE FILMS AND THIN-FILM TRANSISTOR CIRCUITS SEPARATED BY THIN SILICON NITRIDE FOR A COLOR IMAGE SENSOR .....1672**  
Hokuto Seo<sup>2</sup>, Toshikatsu Sakai<sup>2</sup>, Hiroshi Ohtake<sup>2</sup>, Mamoru Furuta<sup>1</sup>  
<sup>1</sup>Kochi University of Technology, Japan; <sup>2</sup>Nippon Hosyo Kyokai, Japan

**13:00**  
**QUALITY MONITORING OF DIESEL EXHAUST FLUID IN VEHICLES USING DIFFRACTIVE INTERFERENCE SENSORS .....1676**  
Nityanand Kumawat, Parama Pal, Manoj Varma  
Indian Institute of Science, India

**13:15**  
**INTERFEROMETRIC PARTICLE IMAGING SYSTEM FOR INDUSTRIAL AND NAVAL APPLICATIONS .....1679**  
Eric Ebert, Willfried Kröger, Kay Domke, Nils Damaschke  
Universität Rostock, Germany

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**12:00 - 13:30**  
**C2L-C: MATERIALS AND PROCESSES**  
**Auditorium 3A**  
**Session Chair: Michele Penza (ENEA, Italy)**

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**12:00**  
**PHOSPHATE SENSORS BASED ON NANOFIBROUS CO ELECTRODES ..... B#**  
Xiaochen Wang, Xiangmeng Ma, Woo Hyung Lee, Hyung Jin Cho  
University of Central Florida, USA

**12:15**  
**INTERLACING METHOD FOR MICRO-PATTERNING SILVER VIA INKJET PRINTING.....1687**  
Guijun Li, Robert Roberts, Norman C. Tien  
University of Hong Kong, Hong Kong

**12:30**  
**INTEGRATION OF PDMS MICROFILTERS AND MICROMIXERS BONDED ONTO APTES-FUNCTIONALIZED POLYMERIC FILMS FOR SIZE SORTING AND MIXING OF MICROPARTICLES .....1691**  
Michael Lee<sup>3</sup>, Abdoullatif Baraket<sup>3</sup>, Nadia Zine<sup>2</sup>, Nicole Jaffrezic-Renault<sup>2</sup>, Abdelhamid Errachid<sup>2</sup>, Maria Jose Lopez-Martinez<sup>1</sup>, Jaume Esteve<sup>1</sup>, Jose Antonio Plaza<sup>1</sup>, Naveed Ahmed<sup>3</sup>, Abdelhamid Elaissari<sup>3</sup>  
<sup>1</sup>Instituto de Microelectronica de Barcelona, Spain; <sup>2</sup>Université Claude-Bernard Lyon 1, France; <sup>3</sup>Université de Lyon, France

**12:45**  
**FABRICATION OF HIERARCHICALLY STRUCTURED SUPERHYDROPHOBIC PDMS SURFACES BY CUO CASTING.....1695**  
Christopher Migliaccio, Nathan Lazarus  
U.S. Army Research Laboratory, USA

**13:00**  
**PARAMETER STUDY OF MICROWAVE ASSISTED EXFOLIATION OF GRAPHITE AND ITS APPLICATION TO LARGE DEFORMATION STRAIN SENSORS .....1699**  
Jonghun Kim, Seungkeun Oh, Sang-Hee Yoon  
Inha University, South Korea

13:15

**A POST PROCESSING APPROACH FOR MANUFACTURING HIGH-DENSITY STRETCHABLE  
SENSOR ARRAYS .....1703**

Angel Savov<sup>2</sup>, Saeed Pakazad<sup>2</sup>, Shivani Joshi<sup>2</sup>, Vincent Henneken<sup>1</sup>, Ronald Dekker<sup>2</sup>  
<sup>1</sup>Philips Research, Netherlands; <sup>2</sup>Technische Universiteit Delft, Netherlands

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12:00 - 13:30

**C2L-D: AUTOMATION APPLICATIONS**

**Auditorium 3B**

**Session Chairs: Jurgen Kosel (King Abdullah University of Science and Technology, Saudi Arabia), Salvatore  
Baglio (Università degli Studi di Catania, Italy)**

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12:00

**TEXTURE MEASUREMENT AND IDENTIFICATION OF OBJECT SURFACE BY MEMS  
TACTILE SENSOR .....1706**

Masayuki Sohgewa<sup>1</sup>, Kosuke Watanabe<sup>3</sup>, Takeshi Kanashima<sup>3</sup>, Masanori Okuyama<sup>3</sup>, Takashi Abe<sup>1</sup>,  
Haruo Noma<sup>4</sup>, Teruaki Azuma<sup>2</sup>  
<sup>1</sup>Niigata University, Japan; <sup>2</sup>Nitta Corporation, Japan; <sup>3</sup>Osaka University, Japan; <sup>4</sup>Ritsumeikan University, Japan

12:15

**IN-HAND OBJECT LOCALIZATION: SIMPLE VS. COMPLEX TACTILE SENSORS .....1710**

Andres Salomon Vazquez, Raul Fernandez, Antonio Lopez, Enrique Valero, Ismael Payo, Antonio Adan  
*Universidad de Castilla-La Mancha, Spain*

12:30

**HIGH-RESOLUTION ACOUSTIC IMAGING IN AIR BY SYNTHETIC APERTURE USING  
PIXEL-WISE MATCHED KERNELS .....1714**

Tomi Nihtilä, Juha Jylhä, Ari Visa  
*Tampere University of Technology, Finland*

12:45

**POSITION PREDICTIVE CONTROL OF AN ANTHROPOMORPHIC ROBOTIC ARM USING  
A TIME-OF-FLIGHT CAMERA .....1718**

Silvia Satorres Martínez, Jesus de la Casa Cárdenas, Javier Gámez García, Juan Gómez Ortega  
*Universidad de Jaén, Spain*

13:00

**VEHICULAR ENGINE OIL SERVICE LIFE CHARACTERIZATION USING ON-BOARD  
DIAGNOSTIC (OBD) SENSOR DATA .....1722**

Joshua Siegel, Rahul Bhattacharyya, Ajay Deshpande, Sanjay Sarma  
*Massachusetts Institute of Technology, USA*

13:15

**ODOR ASSESSMENT OF AUTOMOBILE CABIN AIR BY MACHINE OLFACTION .....1726**

Juan Li<sup>2</sup>, Ryan D. Hodges<sup>2</sup>, Susan Schiffman<sup>2</sup>, H. Troy Nagle<sup>2</sup>, Ricardo Gutierrez-Osuna<sup>3</sup>, Gail Luckey<sup>1</sup>,  
Joel Crowell<sup>1</sup>  
<sup>1</sup>Hyundai Motor Group, USA; <sup>2</sup>North Carolina State University, USA;  
<sup>3</sup>Texas A&M University, USA

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12:00 - 13:30

**C2L-E: TACTILE/FORCE SENSORS**

Rooms 1 & 2

Session Chairs: Rajanna Konandur (Indian Institute of Science, India), Zheyao Wang (Tsinghua University, China)

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12:00

**LOW-TEMPERATURE FLEXIBLE PIEZOELECTRIC ALN CAPACITOR INTEGRATED ON ULTRA-FLEXIBLE POLY-SI TFT FOR ADVANCED TACTILE SENSING .....1730**

Francesco Maita, Luca Maiolo, Alessandro Pecora, Antonio Minotti, Guglielmo Fortunato, Emanuele Smecca, Alessandra Alberti

*Consiglio Nazionale delle Ricerche, Italy*

12:15

**TACTILE SENSORS WITH INTEGRATED PIEZOELECTRIC POLYMER AND LOW VOLTAGE ORGANIC THIN-FILM TRANSISTORS .....1734**

Piero Cosseddu<sup>1</sup>, Fabrizio Viola<sup>1</sup>, Stefano Lai<sup>1</sup>, Luigi Raffo<sup>1</sup>, Lucia Seminara<sup>2</sup>, Luigi Pinna<sup>2</sup>, Maurizio Valle<sup>2</sup>, Ravinder Singh Dahiya<sup>3</sup>, Annalisa Bonfiglio<sup>1</sup>

<sup>1</sup>Università degli Studi di Cagliari, Italy; <sup>2</sup>Università degli Studi di Genova, Italy; <sup>3</sup>University of Glasgow, United Kingdom

12:30

**A CAPACITIVE PRESSURE SENSOR WITH MINIMUM FOOT PRINT FOR CMOS INTEGRATION .....1737**

Thoralf Kautzsch, Steffen Bieselt

*Infineon Technologies Dresden GmbH, Germany*

12:45

**DEVELOPMENT OF A LASER MICRO-MACHINED INTERDIGITATED CAPACITIVE STRAIN SENSOR FOR STRUCTURAL HEALTH MONITORING APPLICATIONS .....1741**

Hung Cao<sup>1</sup>, Chokri Jebali<sup>1</sup>, Ammar K. Kouki<sup>1</sup>, Shreyas Thakar<sup>2</sup>, Cuong Nguyen<sup>2</sup>, Smitha Rao<sup>2</sup>, J.-C. Chiao<sup>2</sup>

<sup>1</sup>École de Technologie Supérieure, Canada; <sup>2</sup>University of Texas at Arlington, USA

13:00

**FORCE-COMPENSATING MEMS SENSOR FOR AFM CANTILEVER STIFFNESS CALIBRATION .....1745**

M. Bulut Coskun<sup>1</sup>, Steven Moore<sup>2</sup>, S.O. Reza Moheimani<sup>2</sup>, Adrian Neild<sup>1</sup>, Tuncay Alan<sup>1</sup>

<sup>1</sup>Monash University, Australia; <sup>2</sup>University of Newcastle, Australia

13:15

**MULTIMODAL MEASUREMENT OF PROXIMITY AND TOUCH FORCE BY LIGHT- AND STRAIN-SENSITIVE MULTIFUNCTIONAL MEMS SENSOR .....1749**

Masayuki Sohgawa<sup>1</sup>, Akito Nozawa<sup>1</sup>, Hokuto Yokoyama<sup>3</sup>, Takeshi Kanashima<sup>3</sup>, Masanori Okuyama<sup>3</sup>, Takashi Abe<sup>1</sup>, Haruo Noma<sup>4</sup>, Teruaki Azuma<sup>2</sup>

<sup>1</sup>Niigata University, Japan; <sup>2</sup>Nitta Corporation, Japan; <sup>3</sup>Osaka University, Japan; <sup>4</sup>Ritsumeikan University, Japan

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12:00 - 13:30

**C2L-F: BIOSENSORS FOR CELL ANALYSIS I**

Rooms 3 & 4

Session Chair: Ana Moya (Consejo Superior de Investigaciones Científicas, Spain)

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12:00

**EXTRACTION OF ACTIVE ENZYMES FROM "HARD-TO-BREAK-CELLS": EVALUATION BY A RCA-BASED ASSAY .....1753**

Alessio Ottaviani<sup>1</sup>, Cinzia Tesauro<sup>1</sup>, Søren Fjelstrup<sup>1</sup>, Rikke Frøhlich Hougaard<sup>1</sup>, Paola Fiorani<sup>2</sup>, Alessandro Desideri<sup>2</sup>, Birgitta Knudsen<sup>1</sup>, Yi-Ping Ho<sup>1</sup>

<sup>1</sup>Aarhus University, Denmark; <sup>2</sup>Università degli Studi di Roma Tor Vergata, Italy

12:15

**SENSING OF BIOMOLECULAR MOTION OF LIPOSOME AND TARGET PROTEIN, AND THEIR INTERACTION BY DIELECTRIC DISPERSION ANALYSIS FOR 100-1000 MHZ RANGE .....1757**

Tomoki Yoshikawa, Keisuke Takada, Ziyang Zhang, Kaoru Yamashita, Minoru Noda

Kyoto Institute of Technology, Japan

12:30

**A REAL TIME IMMUNOASSAY IN ALUMINA MEMBRANES .....1760**

Jesús Álvarez<sup>5</sup>, Laura Sola<sup>1</sup>, Marina Cretich<sup>1</sup>, Marcus Swann<sup>2</sup>, Kristinn Gylfasson<sup>3</sup>, Tormod Volden<sup>4</sup>, Marcella Chiari<sup>1</sup>, Daniel Hill<sup>5</sup>

<sup>1</sup>Consiglio Nazionale delle Ricerche, Italy; <sup>2</sup>Farfield, United Kingdom; <sup>3</sup>Royal Institute of Technology, Sweden; <sup>4</sup>Swiss Center for Electronics and Microtechnology, Switzerland; <sup>5</sup>Universitat de València, Spain

12:45

**PROBING THE DYNAMICS OF THE PROTON-MOTIVE FORCE IN E. COLI .....1764**

Tom Zajdel<sup>2</sup>, Michaela Teravest<sup>2</sup>, Behzad Rad<sup>1</sup>, Caroline Ajo-Franklin<sup>1</sup>, Michel Maharbiz<sup>2</sup>

<sup>1</sup>Lawrence Berkeley National Laboratory, USA; <sup>2</sup>University of California, Berkeley, USA

13:00

**MICRONEEDLE SENSOR FOR VOLTAMMETRIC DRUG DETECTION IN PHYSIOLOGICAL FLUIDS .....1768**

Patricia Vazquez<sup>1</sup>, Conor O'Mahony<sup>1</sup>, Joseph O'Brien<sup>1</sup>, James Scully<sup>1</sup>, Alan Blake<sup>1</sup>, Cian O'Mathuna<sup>1</sup>, Paul Galvin<sup>1</sup>, Gregoire Herzog<sup>2</sup>

<sup>1</sup>Tyndall National Institute, Ireland; <sup>2</sup>Universite de Lorraine, France

13:15

**ANALYSES OF SINGLE-CELL MECHANOELECTRICAL PROPERTIES VIA MICROFLUIDICS .....1772**

Vaishnavi Srinivasaraghavan, Deepti Aggarwal, Hesam Babahosseini, Diana Nakidde, Jeannine Strobl, Masoud Agah  
Virginia Polytechnic Institute and State University, USA

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12:00 - 13:30

**C2L-G: LATE NEWS: OTHER PHYSICAL, CHEMICAL AND OPTICAL SENSORS**

Rooms 6 & 7

Session Chair: Francisco J. Arregui (Universidad Publica de Navarra, Spain)

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12:00

**BRILLOUIN DISTRIBUTED SENSING ASSISTED BY BRILLOUIN AMPLIFICATION OF PUMP PULSES .....1776**

Javier Urricelqui, Mikel Sagues, Alayn Loayssa

Universidad Pública de Navarra, Spain

12:15

**MASH2-0 ELECTROMECHANICAL SIGMA-DELTA MODULATOR FOR CAPACITIVE MEMS SENSORS USING DUAL QUANTIZATION METHOD.....1780**

Bader Almutairi<sup>2</sup>, Ali Alshehri<sup>2</sup>, Michael Kraft<sup>1</sup>

<sup>1</sup>Universität Duisburg-Essen, Germany; <sup>2</sup>University of Southampton, United Kingdom

12:30

**AN RF/MICROWAVE MICROFLUIDIC SENSOR BASED ON A 3D CAPACITIVE STRUCTURE WITH A FLOATING ELECTRODE FOR MINIATURIZED DIELECTRIC SPECTROSCOPY .....1784**

Michael Suster<sup>1</sup>, Brecken Blackburn<sup>2</sup>, Umut Gurkan<sup>1</sup>, Pedram Mohseni<sup>1</sup>

<sup>1</sup>Case Western Reserve University, USA; <sup>2</sup>Cornell University, USA

12:45

**IMPROVED PRESSURE RESPONSE WITH EMBEDDED SOLID MICROBEADS IN MICROFLUIDIC SOFT SENSORS.....1788**

Hee-Sup Shin, Yong-Lae Park

Carnegie Mellon University, USA

13:00

**A MEMS CAPACITIVE PH SENSOR FOR HIGH ACIDIC AND BASIC SOLUTIONS.....1792**

Md Shamsul Arefin, M. Bulut Coskun, Tuncay Alan, Adrian Neild, Jean-Michel Redoute, Mehmet Yuce

Monash University, Australia

13:15

**DISTRIBUTED DEPLOYMENT ALGORITHMS IN A NETWORK OF NONIDENTICAL MOBILE SENSORS SUBJECT TO LOCATION ESTIMATION ERROR.....1795**

Hamid Mahboubi, Mojtaba Vaezi, Fabrice Labeau

McGill University, Canada

## WEDNESDAY, NOVEMBER 5TH – POSTER SESSION

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15:00 - 16:20

**C3P-H: CHEMICAL AND GAS SENSOR SYSTEMS**

Poster Area - Foyer

Session Chair: Eduard Llobet (Universitat Rovira i Virgili, Spain)

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**IMPROVEMENT IN RESPONSE OF SWELLING CLAD-TYPE POF HUMIDITY SENSOR USING A MULTICLADDING LAYER .....1799**

Masayuki Morisawa, Shigeaki Kato

University of Yamanashi, Japan

**CASCADE OF ARTIFICIAL NEURAL NETWORK COMMITTEES FOR THE CALIBRATION OF SMALL GAS COMMERCIAL SENSORS FOR NO<sub>2</sub>, NH<sub>3</sub> AND CO .....1803**

Manuel Aleixandre, Daniel Matatagui, Jose Pedro Santos, Maria Del Carmen Horrillo

Consejo Superior de Investigaciones Científicas, Spain

**A METHOD FOR OBTAINING DEPENDENCE MATHEMATICAL MODELS FROM GRAPHICS IN CHEMICAL SENSORS .....1807**

Ismael Monsonís, Jose Pelegri-Sebastia, Tomas Sogorb, Vicente Llario, Vicente Estruch

Universitat Politècnica de València, Spain

<b>HIGHLY SENSITIVE ELECTROCHEMICAL SENSOR BASED ON BISMUTH NANOPOWDERS FOR DETECTING HEAVY METALS AND URANIUM</b> .....	<b>1811</b>
Gyoung-Ja Lee, Min Ku Lee, Chang Kyu Rhee <i>Korea Atomic Energy Research Institute, South Korea</i>	
<b>A GAS SENSOR USING DOUBLE SPLIT-RING RESONATOR COATED WITH CONDUCTING POLYMER AT MICROWAVE FREQUENCIES</b> .....	<b>1815</b>
Byung-Hyun Kim, Yong-Joo Lee, Hee-Jo Lee, Yunseog Hong, Jong-Gwan Yook, Moon Hyun Chung, Wonseok Cho, Hyang-Hee Choi <i>Yonsei University, South Korea</i>	
<b>A REFLECTION TYPE GAS SENSOR USING CONDUCTING POLYMER AS A VARIABLE IMPEDANCE AT MICROWAVE FRQUENCIES</b> .....	<b>1819</b>
Yong-Joo Lee, Byung-Hyun Kim, Hee-Jo Lee, Yunseog Hong, Jong-Gwan Yook, Hyang-Hee Choi, Seung Hwan Lee, Jung Joon Lee <i>Yonsei University, South Korea</i>	
<b>A SUB-PPM AMMONIA GAS SENSOR FOR LIVER DISEASE USING ULTRATHIN INN-BASED GAS SENSOR</b> .....	<b>B#5</b>
Kun-Wei Kao, Chin-Jen Cheng, Shangjr Gwo, J. Andrew Yeh <i>National Tsing Hua University, Taiwan</i>	
<b>PACKAGING A PIEZORESISTIVE PRESSURE SENSOR FOR INTRACRANIAL PRESSURE MONITORING</b> .....	<b>1827</b>
Xiawei Meng, Yulong Zhao <i>Xi'an Jiaotong University, China</i>	
<b>NOVEL NI3S2 BASED ROOM TEMPERATURE HUMIDITY SENSOR AND POTENTIAL BREATH ANALYZER</b> .....	<b>B#5</b>
Ella Liganiso <sup>1</sup> , Bonex Mwakikunga <sup>1</sup> , Neil Coville <sup>4</sup> , Sabelo Mhlanga <sup>3</sup> , Trilok Singh <sup>2</sup> , Thomas Fischer <sup>2</sup> , Sanjay Mathur <sup>2</sup> <sup>1</sup> <i>Council for Scientific and Industrial Research, South Africa; </i> <sup>2</sup> <i>Universität zu Köln, Germany; </i> <sup>3</sup> <i>University of Johannesburg, South Africa; </i> <sup>4</sup> <i>University of the Witwatersrand, South Africa</i>	
<b>MOLECULARLY IMPRINTED POLYPYRROLE FOR THE ELECTROCHEMICAL DETECTION OF SULFADIMETHOXINE: THE EFFECT OF IMPRINTING PARAMETERS</b> .....	<b>1835</b>
Elisabetta Mazzotta <sup>2</sup> , Antonio Turco <sup>2</sup> , Cosimino Malitesta <sup>2</sup> , Stefania Corvaglia <sup>1</sup> <sup>1</sup> <i>Elettra Sincrotrone Trieste, Italy; </i> <sup>2</sup> <i>Università del Salento, Italy</i>	
<b>SELECTIVE DETECTION OF UNBURNED-HYDROCARBON IN THE EXHAUST GAS USING CATALYTIC FILTER</b> .....	<b>1839</b>
Mohammad Hossein Saberi, Abbasali Khodadadi, Yadollah Mortazavi <i>University of Tehran, Iran</i>	
<b>MODELING AND CHARACTERIZATION OF THE TRANSIENT PERFORMANCE OF A GAS DETECTOR BASED ON FRINGE-FIELD CAPACITANCE</b> .....	<b>1843</b>
Kenichi Morimoto <sup>2</sup> , Yutao Qin <sup>1</sup> , Yogesh Gianchandani <sup>1</sup> <sup>1</sup> <i>University of Michigan, USA; </i> <sup>2</sup> <i>University of Tokyo, Japan</i>	

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15:00 - 16:20

**C3P-J: BIOSENSORS FOR CELL ANALYSIS II**

Poster Area - Foyer

Session Chair: Roc Berenguer (CEIT and Tecnun, University of Navarra, Spain)

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**WIRELESS SURFACE-SCANNING ME BIOSENSORS SYSTEM FOR BACTERIAL DETECTION ON FRESH PRODUCE .....1847**

Yating Chai, Shin Horikawa, Howard C. Wikle, Aleksandr Simonian, Bryan Chin  
*Auburn University, USA*

**SELECTION AND CHARACTERIZATION OF DNA APTAMERS WITH BINDING SELECTIVITY TO CAMPYLOBACTER JEJUNI USING WHOLE-CELL SELEX.....B#5**

Jihe Moon, Giyoung Kim, Saetbyeol Park, Jongguk Lim, Changyeun Mo  
*National Academy of Agricultural Sciences, South Korea*

**MICROFLUIDIC SEDIMENTATION SYSTEM FOR SEPARATION OF PLASMA FROM WHOLE BLOOD.....1854**

Chiaki Kuroda<sup>3</sup>, Yoshimichi Ohki<sup>3</sup>, Hiroki Ashiba<sup>1</sup>, Makoto Fujimaki<sup>1</sup>, Koichi Awazu<sup>1</sup>, Torahiko Tanaka<sup>2</sup>, Makoto Makishima<sup>2</sup>  
*<sup>1</sup>National Institute of Advanced Industrial Science and Technology, Japan; <sup>2</sup>Nihon University School of Medicine, Japan; <sup>3</sup>Waseda University, Japan*

**BLOOD PRETREATMENT CHIP BOTH FOR FILTERING THE BLOOD CELLS AND REDUCING THE ALBUMIN CONCENTRATION IN WHOLE BLOOD ..... B#5**

Kwang Hyo Chung, Yo Han Choi, Choon-Gi Choi  
*Electronics and Telecommunications Research Institute, South Korea*

**REMOVAL OF NONSPECIFIC BINDINGS IN ON-CHIP ELISAS WITH LOW POWER ULTRASOUND .....1862**

Lukas Brandhoff<sup>6</sup>, Michael J. Vellekoop<sup>6</sup>, Heinz Redl<sup>3</sup>, Anna Haller<sup>5</sup>, Helene Zirath<sup>1</sup>, Johannes Peham<sup>1</sup>, Herbert Wiesinger-Mayr<sup>1</sup>, Andreas Spittler<sup>4</sup>, Guntram Schnetz<sup>2</sup>  
*<sup>1</sup>Austrian Institute of Technology, Austria; <sup>2</sup>Biegler GmbH, Austria; <sup>3</sup>Ludwig Boltzmann Institute for Experimental and Clinical Traumatology, Austria; <sup>4</sup>Medical University of Vienna, Austria; <sup>5</sup>Technische Universität Wien, Austria; <sup>6</sup>Universität Bremen, Germany*

**USING THE NEWLY MICROFLUIDIC BIOSENSOR FOR CARCINOEMBRYONIC ANTIGEN DETECTION.....1866**

Chia-Hsien Yeh<sup>2</sup>, Kuan-Feng Su<sup>2</sup>, Yu-Cheng Lin<sup>2</sup>, Pi-Lan Shen<sup>1</sup>  
*<sup>1</sup>FirstStep Bioresearch, Inc., Taiwan; <sup>2</sup>National Cheng Kung University, Taiwan*

**MINIATURE NEUROTRANSMITTER SENSORS FEATURED WITH IRIIDIUM OXIDE NANORODS.....1869**

Cuong Nguyen, Smitha Rao, J.-C. Chiao, Hung Cao, Ailing Li, Yuan Peng  
*University of Texas at Arlington, USA*

**OPTIMIZING A NEW BLOOD PRESSURE SENSOR FOR MAXIMUM PERFORMANCE BASED ON FINITE ELEMENT MODEL.....1873**

Tse-Yi Tu<sup>2</sup>, Yung-Hua Kao<sup>2</sup>, Paul C.-P. Chao<sup>2</sup>, Yung-Pin Lee<sup>1</sup>  
*<sup>1</sup>MedSense Inc., Taiwan; <sup>2</sup>National Chiao Tung University, Taiwan*



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15:00 - 16:20

**C3P-K: OPTICAL SENSORS III**

Poster Area - Foyer

Session Chairs: Jesus M. Corres (Public University of Navarra, Spain), Carlos Ruiz Zamarreño (Public University of Navarra, Spain)

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- DEVELOPMENT OF OPTICAL SENSOR FOR SOFT TISSUE SARCOMA BOUNDARY DETECTION USING OPTICAL COHERENCE ELASTOGRAPHY .....1877**  
Shang Wang<sup>3</sup>, Jiasong Li<sup>2</sup>, Raphael E. Pollock<sup>4</sup>, Irina V. Larina<sup>1</sup>, Kirill Larin<sup>2</sup>  
<sup>1</sup>Baylor College of Medicine, USA; <sup>2</sup>University of Houston, USA; <sup>3</sup>University of Houston & Baylor College of Medicine, USA; <sup>4</sup>University of Texas MD Anderson Cancer Center, USA
- EXTRACTING VIBRATIONAL PARAMETERS FROM THE TIME-FREQUENCY MAP OF A SELF MIXING SIGNAL: AN APPROACH BASED ON WAVELET ANALYSIS .....1881**  
Ajit Jha, Santiago Royo, Francisco Javier Azcona, Carlos Yanez  
*Universitat Politècnica de Catalunya, Spain*
- EXPERIMENTAL DEMONSTRATION OF A LEAKAGE MONITORING SYSTEM FOR LARGE DIAMETER WATER PIPES USING A FIBER OPTIC DISTRIBUTED SENSOR SYSTEM .....1885**  
Ruben Ruiz Lombera<sup>2</sup>, Jesus Mirapeix Serrano<sup>2</sup>, Oscar Martinez<sup>1</sup>, Jose Domingo San Emeterio<sup>1</sup>, José Miguel López-Higuera<sup>2</sup>  
<sup>1</sup>Constructora Obras Públicas San Emeterio S.A., Spain; <sup>2</sup>Universidad de Cantabria, Spain
- EXTREMELY LOW RESONANCE FREQUENCY MOEMS VIBRATION SENSORS WITH SUB-PM RESOLUTION .....1889**  
Wilfried Hortschitz<sup>1</sup>, Harald Steiner<sup>1</sup>, Michael Stifter<sup>1</sup>, Franz Kohl<sup>1</sup>, Andreas Kainz<sup>2</sup>, Tobias Raffelsberger<sup>2</sup>, Franz Keplinger<sup>2</sup>  
<sup>1</sup>Donau-Universität Krems, Austria; <sup>2</sup>Technische Universität Wien, Austria
- NOVEL HIGH RESOLUTION MOEMS INCLINATION SENSOR .....1893**  
Wilfried Hortschitz<sup>1</sup>, Harald Steiner<sup>1</sup>, Michael Stifter<sup>1</sup>, Franz Kohl<sup>1</sup>, Matthias Kahr<sup>2</sup>, Andreas Kainz<sup>2</sup>, Tobias Raffelsberger<sup>2</sup>, Franz Keplinger<sup>2</sup>  
<sup>1</sup>Donau-Universität Krems, Austria; <sup>2</sup>Technische Universität Wien, Austria
- ENHANCED SENSITIVITY IN PERIODICALLY COUPLED ANTENNA SENSORS .....1897**  
Sang-Yeon Cho, Jayson Briscoe  
*New Mexico State University, USA*
- MATHEMATICAL MODELLING FOR CORRELATION BETWEEN TEMPERATURE AND MECHANICAL STRAIN IN LONG PERIOD GRATINGS .....1900**  
Felipe Delgado, Daniel Silveira, Thiago Coelho, Alexandre Bessa dos Santos  
*Universidade Federal de Juiz de Fora, Brazil*
- FIBER-LOOP SENSOR FOR GROUND DISPLACEMENT DETECTION IN HILLSLOPES..... B#5**  
Mohd Kamil Abd-Rahman, Nor Jannah Muhamad Satar  
*Universiti Teknologi MARA, Malaysia*
- NOVEL OPTICAL MEMS PRESSURE SENSORS INCORPORATING WAVEGUIDE BRAGG GRATINGS ON DIAPHRAGMS.....1908**  
Prasant Kumar Pattnaik, Vellauru Neeharika  
*Birla Institute of Technology & Science, India*
- LOW VOLTAGE TRANSDUCER BASED ON THE CHANGES IN THE WAVELENGTH OF THE ATTENUATION BAND .....1912**  
Joaquin Ascorbe, Jesus Corres, Francisco Javier Arregui, Ignacio Raúl Matías  
*Universidad Pública de Navarra, Spain*

**OPTICAL FIBER HUMIDITY SENSOR BASED ON A TAPERED FIBER ASYMMETRICALLY COATED WITH INDIUM TIN OXIDE.....1916**

Joaquin Ascorbe, Jesus Corres, Francisco Javier Arregui, Ignacio Raúl Matías  
*Universidad Pública de Navarra, Spain*

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**15:00 - 16:20**

**C3P-L: MECHANICAL AND PHYSICAL SENSORS III**

**Poster Area - Foyer**

**Session Chair: Siavash Pourkamali (University of Texas at Dallas, USA)**

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**SOI 3-AXIS ACCELEROMETER WITH A STRESS REDUCTION STRUCTURE.....1920**

Motohiro Fujiyoshi<sup>1</sup>, Yoshiteru Omura<sup>1</sup>, Hirofumi Funabashi<sup>1</sup>, Teruhisa Akashi<sup>1</sup>, Yoshiyuki Hata<sup>1</sup>,  
Yutaka Nonomura<sup>1</sup>, Takahiro Nakayama<sup>2</sup>, Hitoshi Yamada<sup>2</sup>  
<sup>1</sup>Toyota Central R&D labs., Inc., Japan; <sup>2</sup>Toyota Motor Corporation, Japan

**A NOVEL 2-DIMENSIONAL ELECTRIC FIELD SENSOR BASED ON IN-PLANE MICRO ROTARY ACTUATOR .....1924**

Yu Wang, Dongming Fang, Ke Feng, Ren Ren, Bo Chen, Chunrong Peng, Shanhong Xia  
*Chinese Academy of Sciences, China*

**DEVELOPMENT OF OPTICAL PROBE CURRENT SENSOR WITH KERR EFFECT FOR POWER ELECTRONICS.....1928**

Daiki Karasawa, Makoto Sonehara, Shin Kitazawa, Toshiro Sato  
*Shinshu University, Japan*

**TORQUE RIPPLE COMPENSATION METHOD FOR JOINT TORQUE SENSOR EMBEDDED IN HARMONIC DRIVE USING ORDER ANALYSIS .....1932**

Byung-Jin Jung, Byungchul Kim, Seonggi Kim, Jachoon Koo, Hyouk Ryeol Choi, Hyungpil Moon  
*Sungkyunkwan University, South Korea*

**ASSOCIATED IDTS IN SURFACE ACOUSTIC WAVE DEVICES FOR CLOSED-LOOP CONTROL INKJET SYSTEM .....1936**

Hang Bui Thu<sup>1</sup>, Pasqualina M. Sarro<sup>1</sup>, Tung Bui Duc<sup>2</sup>, Trinh Chu Duc<sup>2</sup>  
<sup>1</sup>Technische Universiteit Delft, Netherlands; <sup>2</sup>Vietnam National University, Hanoi, Vietnam

**DIRECT DETERMINATION OF THE VOLUMETRIC HEAT CAPACITY OF LIQUIDS USING A MEMS SENSOR AND EFFICIENT EVALUATION METHODS .....1940**

Roman Beigelbeck<sup>1</sup>, Samir Cerimovic<sup>1</sup>, Franz Kohl<sup>1</sup>, Artur Jachimowicz<sup>1</sup>, Thomas Voglhuber-Brunnmaier<sup>2</sup>, Bernhard Jakoby<sup>3</sup>  
<sup>1</sup>Donau-Universität Krems, Austria; <sup>2</sup>Donau-Universität Krems / Johannes Kepler Universität Linz, Austria; <sup>3</sup>Johannes Kepler Universität Linz, Austria

**FORCE PROPORTIONAL TOUCHPAD WITH GESTURE AND MANEUVER SENSING..... B#5**

Shenshen Zhao, Chang Liu  
*Northwestern University, USA*

**PIEZOELECTRIC RESONANT MEMS BALANCES WITH HIGH LIQUID PHASE Q.....1948**

Mohammad Mahdavi<sup>2</sup>, Gilberto Guerra<sup>2</sup>, Hailey McCurry<sup>2</sup>, Siavash Pourkamali<sup>2</sup>, Reza Abdolvand<sup>1</sup>  
<sup>1</sup>University of Central Florida, USA; <sup>2</sup>University of Texas at Dallas, USA

**A MONOLITHIC INTEGRATION MULTIFUNCTIONAL MEMS SENSOR BASED ON CAVITY SOI WAFER .....1952**

Yangxi Zhang, Chenchen Yang, Fanrui Meng, Guandong Liu, Chengchen Gao, Yilong Hao  
*Peking University, China*

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15:00 - 16:20

**C3P-M: SENSORS & SENSOR SYSTEMS II**

Poster Area - Foyer

Session Chairs: Oliver Paul (University of Freiburg, Germany), Gijs Krijnen (University of Twente, Netherlands)

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**DYNAMIC RESPONSE OF MEMS SENSOR NEAR FUNDAMENTAL AND HIGHER-ORDER FREQUENCIES .....1956**

Hassen Ouakad<sup>2</sup>, Mohammad Younis<sup>1</sup>

<sup>1</sup>Binghamton University, USA; <sup>2</sup>King Fahd University of Petroleum and Minerals, Saudi Arabia

**MODAL LIQUID CRYSTAL TEMPERATURE SENSOR .....1960**

José Francisco Algorri, Pedro Contreras Lallana, Virginia Urruchi, José Manuel Sánchez-Pena  
*Universidad Carlos III de Madrid, Spain*

**COMPARISON OF IN-PLANE AND OUT-OF-PLANE PIEZOELECTRIC MICRORESONATORS FOR DENSITY AND VISCOSITY MEASUREMENTS IN OIL MIXTURES ..... B#5**

Javier Toledo Serrano<sup>2</sup>, Tomás Manzaneque<sup>2</sup>, Victor Ruiz-Díez<sup>2</sup>, Jorge Hernando-García<sup>2</sup>, Elisabeth Wistrela<sup>1</sup>, Martin Kucera<sup>1</sup>, Ulrich Schmid<sup>1</sup>, José Luis Sánchez-Rojas<sup>2</sup>

<sup>1</sup>Technische Universität Wien, Austria; <sup>2</sup>Universidad de Castilla-La Mancha, Spain

**A CONFIGURABLE SMART E-NOSE FOR SPATIO-TEMPORAL OLFACTORY ANALYSIS .....1968**

Carlos Sanchez-Garrido, Javier G. Monroy, Javier Gonzalez-Jimenez  
*Universidad de Málaga, Spain*

**FRICION-BASED SLIPPAGE DETECTION STRATEGY: PRINCIPLES AND PROTOTYPE ..... B#5**

Pavel Dzitac<sup>2</sup>, Abdul Mazid<sup>1</sup>

<sup>1</sup>Central Queensland University, Australia; <sup>2</sup>Deakin University, Australia

**OLFACTORY SEARCH BEHAVIOR OF HUMAN WEARING OLFACTORY ASSIST MASK .....1976**

Haruka Matsukura, Hironori Hashiguchi, Hiroshi Ishida  
*Tokyo University of Agriculture and Technology, Japan*

**ACTIVITY AWARENESS CAN IMPROVE CONTINUOUS STRESS DETECTION IN GALVANIC SKIN RESPONSE .....1980**

Tong Boon Tang, Lip Wee Yeo, Dandy Jing Hui Lau  
*Universiti Teknologi Petronas, Malaysia*

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15:00 - 16:20

**C3P-N: SENSOR NETWORKS III**

Poster Area - Foyer

Session Chairs: Spyridon Daskalakis (Technical University of Crete, Greece), Stylianos Assimonis (Technical University of Crete, Greece)

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**METHOD FOR MEASURING INTERNAL RESISTANCE OF BATTERIES IN WSN .....1984**

Rafael Lajara<sup>2</sup>, Jose Pelegri-Sebastia<sup>2</sup>, Juan José Perez-Solano<sup>1</sup>

<sup>1</sup>Universitat de Valencia, Spain; <sup>2</sup>Universitat Politècnica de València, Spain

**WIRELESS SUBSURFACE SENSORS FOR LOW-VOLUME ROADWAY MANAGEMENT .....B#5**

Paul Fortier, Benjamin Viall, Brandon Maliguti, David Prairie, Zaidan Shebar  
*University of Massachusetts Dartmouth, Israel*

**AREA WISE HIGH RESOLUTION WATER AVAILABILITY ESTIMATION USING HETEROGENEOUS REMOTE SENSING AND ENSEMBLE MACHINE LEARNING .....1992**

*Cecil Li, Ritaban Dutta, Daniel Smith*

*Commonwealth Scientific and Industrial Research Organisation, Australia*

**THE USE OF A COSMIC RAY PROBE AS A PROXY OF GREEN VEGETATION BIOMASS .....1996**

*Daniel Smith, Ritaban Dutta, Cecil Li*

*Commonwealth Scientific and Industrial Research Organisation, Australia*

**A WHITE-RABBIT NETWORK INTERFACE CARD FOR SYNCHRONIZED SENSOR NETWORKS .....2000**

*Miguel Jiménez López, Jose Luis Gutiérrez Rivas, Javier Díaz Alonso*

*Universidad de Granada, Spain*

**SOFTWARE CONSIDERATIONS FOR ENERGY HARVESTING WIRELESS SENSOR NETWORKS .....2004**

*Monica Redon Segrera*

*Analog Devices Inc., Spain*

**DISTRIBUTED DATA QUERY WITH DYNAMIC BOUNDED-ERROR IN WIRELESS SENSOR NETWORKS .....2008**

*Jui-Hua Tsai, Yu-Cheng Lien, Yu-Hsien Chu, Ray-I Chang*

*National Taiwan University, Taiwan*

**TOWARDS AIR QUALITY INDICES IN SMART CITIES BY CALIBRATED LOW-COST SENSORS APPLIED TO NETWORKS .....2012**

*Michele Penza, Domenico Suriano, Maria Gabriella Villani*

*ENEA, Italy*

**TARGET TRACKING BEHIND OCCLUSIONS USING A NETWORKED HIGH-SPEED VISION SYSTEM .....2018**

*Akihito Noda, Yuji Yamakawa, Masatoshi Ishikawa*

*University of Tokyo, Japan*

**TWO-CLOCKS SYNCHRONIZATION FOR NETWORKED SENSORS .....2022**

*Juan-Antonio Fernández-Madrugal, Ángel Martínez-Tenor*

*Universidad de Málaga, Spain*

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**15:00 - 16:20**

**C3P-P: SAFETY AND SECURITY APPLICATIONS II**

**Poster Area - Foyer**

**Session Chairs: Troy Nagle (North Carolina State University, USA), Vittorio Ferrari (University of Brascia, Italy)**

**RFID TAG FOR VEGETABLE RIPENING EVALUATION USING AN AUXILIARY SMART GAS SENSOR .....2026**

*Fabrizio Formisano, Ettore Massera, Saverio De Vito, Antonio Buonanno, Girolamo Di Francia, Paola Delli Veneri*

*Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy*

**DETECTING TRACE AMOUNT OF WATER IN CRUDE OIL WITH CAPACITANCE SENSORS .....2030**

*Tong Boon Tang, Yee Ling Lim, M. Zubair Aslam*

*Universiti Teknologi Petronas, Malaysia*

**LASER SCANNER BASED ROAD SURFACE ESTIMATION FOR AUTOMOTIVE APPLICATIONS .....2034**

*Mohamed Essayed Bouzouraa<sup>1</sup>, Martin Kellner<sup>1</sup>, Ulrich Hofmann<sup>1</sup>, Robert Lutz<sup>2</sup>*

*<sup>1</sup>AUDI AG, Germany; <sup>2</sup>Karlsruher Institut für Technologie, Germany*

**OPTICAL SENSING OF FLUORESCENT MARKER FOR FAST DETECTION OF BEVERAGE NATURALITY .....2038**

Ming Sun, Bin Yin, Shelly Su  
*Philips Research, China*

**THIN LAYER EFFECTS IN CAPACITIVE ATMOSPHERIC ICING DETECTION .....2042**

Thomas Bretterkieber, Markus Neumayer, Hubert Zangl  
*Graz University of Technology, Austria*

**A NOVEL APPROACH FOR GAS DISCRIMINATION IN NATURAL ENVIRONMENTS WITH OPEN SAMPLING SYSTEMS .....2046**

Victor Hernandez Bennetts<sup>1</sup>, Erik Schaffernicht<sup>1</sup>, Victor Pomareda Sesé<sup>2</sup>, Achim Lilienthal<sup>1</sup>, Marco Trincavelli<sup>1</sup>  
<sup>1</sup>*Örebro University, Sweden;* <sup>2</sup>*Universitat de Barcelona, Spain*

**A MULTISENSOR DATA FUSION APPROACH FOR THE VOLCANIC ASH GRANULOMETRY CLASSIFICATION.....2050**

Bruno Andò, Salvatore Baglio, Vincenzo Marletta  
*Università degli Studi di Catania, Italy*

**OPEN SOURCE BUILDING SCIENCE SENSORS AN OPEN SOURCE SENSOR NETWORK FOR INDOOR ENVIRONMENTAL DATA COLLECTION .....2054**

Akram Ali, Zachary Zanzinger, Brent Stephens  
*Illinois Institute of Technology, USA*

**APPLICATION ASPECT OF THIN FILM IMPACT SENSOR FOR DETECTING MILK ADULTERATION ..... B#5**

Sudeep Joshi, Nitish Prabhu, M.M. Nayak, Konandur Rajanna  
*Indian Institute of Science, India*

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**15:00 - 16:20**

**C3P-Q: SENSOR MATERIALS AND DEVICES III**

**Poster Area - Foyer**

**Session Chair: Javier Calpe (Analog Devices, Spain)**

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**SAW SENSOR WITHOUT THE REFERENCE CHANNEL BASED ON THE TWO PATH DELAY LINE.....2062**

Sergey Balashov<sup>1</sup>, Carlos Eduardo Teles<sup>2</sup>, Jacobus Willibrordus Swart<sup>2</sup>  
<sup>1</sup>*Center for Information Technology Renato Archer, Brazil;* <sup>2</sup>*Universidade Estadual de Campinas, Brazil*

**MAGNETIC POLYMER NANOCOMPOSITES FOR SENSING APPLICATIONS .....2066**

Ahmed Alfadhel, Bodong Li, Jurgen Kosel  
*King Abdullah University of Science and Technology, Saudi Arabia*

**THIN AND FLEXIBLE PRESSURE/DEFORMATION SENSORS BASED ON PIEZOELECTRIC NANOCOMPOSITES .....2070**

Leonardo Ricotti, Tommaso Ranzani, Valerio Calarota, Arianna Menciassi  
*Scuola Superiore Sant'Anna, Italy*

**SPECTRUM RECONSTRUCTION FROM MIMO PERSPECTIVES FOR REALIZING LOW-COST ON-CHIP SPECTROMETERS .....2074**

Cheng-Chun Chang<sup>2</sup>, Chien-Ta Wu<sup>2</sup>, Yung-Chi Chuang<sup>2</sup>, Byung Il Choi<sup>1</sup>  
<sup>1</sup>*NanoLambda, Inc., South Korea;* <sup>2</sup>*National Taipei University of Technology, Taiwan*

**NOVEL AUTOMATIC DIGITAL CALIBRATION TECHNIQUES FOR GMR SENSORS.....2078**

Antonio Lopez-Martin, Alfonso Carlosena  
*Universidad Pública de Navarra, Spain*

<b>HIGH-FREQUENCY CHARACTERISTICS OF CONDUCTING POLYMER FOR GAS-SENSOR.....</b>	<b>2082</b>
Hee-Jo Lee, Byung-Hyun Kim, Yong-Joo Lee, Yunseog Hong, Jong-Gwan Yook, Seung Hwan Lee, Jung Joon Lee, Hyang-Hee Choi <i>Yonsei University, South Korea</i>	
<b>POLYMER MICROARRAYS FOR SURFACE PLASMON RESONANCE BASED SENSORS.....</b>	<b>2086</b>
Alfred Kick <sup>1</sup> , Michael Mertig <sup>2</sup> <sup>1</sup> <i>Kurt-Schwabe-Institut für Mess- und Sensortechnik e. V. Meinsberg, Germany;</i> <sup>2</sup> <i>Technische Universität Dresden, Germany</i>	
<b>EFFECT OF PROCESS PARAMETERS OF CSI PHOTOCATHODE PREPARATION IN THE ENHANCEMENT OF EFFICIENCY OF UV PHOTON SENSOR.....</b>	<b>2095</b>
Baishali Garai <sup>1</sup> , Venkatraman Radhakrishnan <sup>2</sup> , Konandur Rajanna <sup>1</sup> <sup>1</sup> <i>Indian Institute of Science, India;</i> <sup>2</sup> <i>Indian Space Research Organization, India</i>	
<b>DEVELOPMENT OF MWCNT/SU-8 NANOFIBER COMPOSITE USING ELECTROSPINNING TECHNIQUE FOR BIOSENSING APPLICATIONS.....</b>	<b>2093</b>
Durga Prakash, Siva Rama Krishna V, Asudeb Dutta, Chandrasekar Sharma, Shiv Govind Singh <i>Indian Institute of Technology Hyderabad, India</i>	
<b>MODIFIED STANDARD SCREEN-PRINTING TECHNOLOGY FOR PROCESSING OF FREE-STANDING PHYSICAL AND CHEMICAL SENSORS.....</b>	<b>2097</b>
Hélène Debéda, Claude Lucat <i>Université Bordeaux 1, France</i>	
<b>SELF SENSING OF ELASTOMER ACTUATION BY MEANS OF AC SUPERIMPOSED CURRENT.....</b>	<b>2101</b>
Pedro Llovera-Segovia <sup>1</sup> , Vicente Fuster <sup>1</sup> , Dimitri Letihon <sup>2</sup> , Raphaël Vorias <sup>2</sup> <sup>1</sup> <i>Universitat Politècnica de València, Spain;</i> <sup>2</sup> <i>University of Hasselt, Belgium</i>	
<b>A NOVEL CURRENT-BASED APPROACH FOR VERY LOW VARIATION DETECTION OF RESISTIVE SENSORS IN WHEATSTONE BRIDGE CONFIGURATION.....</b>	<b>2104</b>
Andrea De Marcellis <sup>1</sup> , Candid Reig <sup>2</sup> , Maria-Dolores Cubells <sup>2</sup> <sup>1</sup> <i>Università degli Studi dell'Aquila, Italy;</i> <sup>2</sup> <i>Universitat de València, Spain</i>	
<b>SMART CONTACT LENS USING PASSIVE STRUCTURES.....</b>	<b>2107</b>
Sajina Tinku <sup>1</sup> , Cristian Collini <sup>1</sup> , Leandro Lorenzelli <sup>1</sup> , Ravinder Singh Dahiya <sup>2</sup> <sup>1</sup> <i>Fondazione Bruno Kessler, Italy;</i> <sup>2</sup> <i>University of Glasgow, United Kingdom</i>	
<b>MICRO-TRANSFER-PRINTING: HETEROGENEOUS INTEGRATION OF MICROSCALE SEMICONDUCTOR DEVICES USING ELASTOMER STAMPS.....</b>	<b>2111</b>
Christopher Bower, Matthew Meitl, David Kneeburg <i>X-Celeprint Limited, Ireland</i>	
<b>SELF-ADAPTIVE CORRELATION METHOD FOR SOFT DEFECT DETECTION IN CABLE BY REFLECTOMETRY.....</b>	<b>2114</b>
Soumaya Sallem, Nicolas Ravot <i>CEA Saclay, France</i>	
<b>ACTUATORS FOR TOUCHSCREEN TACTILE OVERLAY.....</b>	<b>2118</b>
Ahmed Farooq, Grigori Evreinov, Roope Raisamo <i>University of Tampere, Finland</i>	
<b>ACCELERATING HARDWARE GAUSSIAN RANDOM NUMBER GENERATION USING ZIGGURAT AND CORDIC ALGORITHMS.....</b>	<b>2122</b>
Biruk Getachew Sileshi, Carles Ferrer, Joan Oliver <i>Universitat Autònoma de Barcelona, Spain</i>	

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16:30 – 18:00

**C4L-A: SPECIAL SESSION: ELECTRONIC TONGUES**

Auditorium 1

Session Chairs: Gijs Krijnen (University of Twente, Netherlands), Santiago Marco (Universitat de Barcelona, Spain)

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16:30

**ELECTRONIC TONGUE AS A RAPID TOOL FOR THE ASSESSMENT OF COFFEE FLAVOUR AND CHEMICAL COMPOSITION .....2126**

Ana Maria Simoes Costa, Maria Madalena Costa Sobral, Ivonne Delgadillo, Alisa Rudnitskaya  
*Aveiro University, Portugal*

17:00

**HYBRID ELECTRONIC TONGUES BASED ON MICROSENSORS APPLIED TO WINE QUALITY CONTROL .....2130**

Manuel Gutiérrez-Capitán<sup>2</sup>, Jordi Vila-Planas<sup>2</sup>, Andreu Llobera<sup>2</sup>, Cecilia Jiménez-Jorquera<sup>2</sup>, Fina Capdevila<sup>1</sup>, Carme Domingo<sup>1</sup>, Anna Puig-Pujol<sup>1</sup>  
<sup>1</sup>*Institut de Recerca i Tecnologia Agroalimentàries-Institut Català de la Vinya i el Vi, Spain;* <sup>2</sup>*Instituto de Microelectrónica de Barcelona, Spain*

17:15

**OPTICAL MONITORING OF WINE ALCOHOLIC FERMENTATION USING A NON-SPECIFIC NDIR MICROARRAY .....2134**

Carlos Calaza, Luis Fonseca  
*Instituto de Microelectrónica de Barcelona, Spain*

17:30

**ANALYSIS OF GRAPES AND WINES USING A VOLTAMMETRIC BIOELECTRONIC TONGUE CORRELATION WITH THE PHENOLIC AND SUGAR CONTENT .....2139**

Maria Luz Rodríguez-Méndez<sup>4</sup>, Cristina Medina-Plaza<sup>4</sup>, Celia García-Hernández<sup>4</sup>, Jose Antonio de Saja<sup>4</sup>, Jose Antonio Fernández-Escudero<sup>2</sup>, Enrique Barajas-Tola<sup>3</sup>, German Medrano<sup>1</sup>  
<sup>1</sup>*Bodega Cooperativa de Cigales, Spain;* <sup>2</sup>*Estación Enológica de Castilla y León, Spain;* <sup>3</sup>*Instituto Tecnológico Agrario de Castilla y León, Spain;* <sup>4</sup>*Universidad de Valladolid, Spain*

17:45

**APPLICATION OF ELECTRONIC TONGUES IN THE QUALITATIVE AND QUANTITATIVE ANALYSIS OF BEERS .....2143**

Xavier Cetó, Manel del Valle  
*Universitat Autònoma de Barcelona, Spain*

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16:30 - 18:00

**C4L-B: PHOTODETECTORS II**

Auditorium 2

Session Chairs: Rihito Kuroda (Tohoku University, Japan), Nicola Massari (Fondazione Bruno Kessler, Italy)

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16:30

**SPEED OPTIMIZED LARGE AREA AVALANCHE PHOTODETECTOR IN STANDARD CMOS TECHNOLOGY FOR VISIBLE LIGHT COMMUNICATION .....2147**

Sagar Ray<sup>1</sup>, Mona M. Hella<sup>1</sup>, Md. Mottaleb Hossain<sup>2</sup>, Payman Zarkesh-Ha<sup>2</sup>, Majeed M. Hayat<sup>2</sup>  
<sup>1</sup>*Rensselaer Polytechnic Institute, USA;* <sup>2</sup>*University of New Mexico, USA*

16:45

**MINIATURIZED PARTICULATE MATTER SENSOR FOR PORTABLE AIR QUALITY MONITORING DEVICES .....2151**

Xueming Li<sup>3</sup>, Elina Iervolino<sup>2</sup>, Fabio Santagata<sup>2</sup>, Jia Wei<sup>3</sup>, Cadmus Yuan<sup>1</sup>, Pasqualina M. Sarro<sup>3</sup>, Kouchi Zhang<sup>3</sup>  
<sup>1</sup>Chinese Academy of Sciences, China; <sup>2</sup>State Key Laboratory of Solid State Lighting, China; <sup>3</sup>Technische Universiteit Delft, Netherlands

17:00

**LOW-PROFILE, SELF-PACKAGED UNCOOLED MICROBOLOMETER ON A FLEXIBLE SUBSTRATE TOWARDS AN INFRARED RADIATION SENSITIVE SKIN.....2155**

Moinuddin Ahmed, Donald Butler, Zeynep Celik-Butler  
University of Texas at Arlington, USA

17:15

**POSITION SENSITIVE PHOTSENSORS BASED ON SIPM ARRAYS.....2159**

Antonio Javier González<sup>2</sup>, Pablo Conde<sup>2</sup>, Liczandro Hernández<sup>2</sup>, Filomeno Sánchez<sup>2</sup>, Jose Benlloch<sup>2</sup>, Stan Majewski<sup>3</sup>, Albert Aguilar<sup>1</sup>, Raimundo Garcia-Olcina<sup>1</sup>, Jose Torres<sup>1</sup>  
<sup>1</sup>Universitat de València, Spain; <sup>2</sup>Universitat Politècnica de València, Spain; <sup>3</sup>West Virginia University, USA

17:30

**A LOW-NOISE HIGH-SENSITIVITY CMOS IMAGE SENSOR FOR SCIENTIFIC AND INDUSTRIAL APPLICATIONS .....2163**

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<sup>1</sup>École Polytechnique Fédérale de Lausanne, Switzerland; <sup>2</sup>STMicroelectronics, France; <sup>3</sup>Université Joseph Fourier, France

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<sup>1</sup>Massachusetts Institute of Technology, USA; <sup>2</sup>Politecnico di Milano, Italy

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<sup>1</sup>*Kyoto University, Japan*; <sup>2</sup>*Murata Manufacturing Company, Japan*

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**16:30 - 18:00**  
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<sup>1</sup>*Aalto University, Finland*; <sup>2</sup>*Universidad Rey Juan Carlos, Spain*

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<sup>1</sup>*Karlsruher Institut für Technologie, Germany*; <sup>2</sup>*Technische Universität Darmstadt, Germany*

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<sup>1</sup>*CIS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH, Germany*; <sup>2</sup>*Technische Universität Darmstadt, Germany*; <sup>3</sup>*Technische Universität Dresden, Germany*

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<sup>1</sup>*Mikroaufbautechnik am HSG-IMAT, Germany*; <sup>2</sup>*Universität Stuttgart, Germany*

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16:30 - 18:00

**C4L-F: WEARABLES**

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