

# IEEE SENSORS 2010 Conference Preliminary Program

## Monday, November 1, 2010

16:00 - 20:00      **Conference Registration and Check-In**

18:00 - 19:00      **Wine & Cheese Welcome Reception**

19:00            **Opening Remarks**

19:15            **KEYNOTE PRESENTATION 1**

A1K-A1      **CYBORG BEETLES: THE REMOTE RADIO CONTROL OF INSECT FLIGHT**  
M.M. Maharbiz  
*Univeristy of California, Berkeley, USA*

## Tuesday, November 2, 2010

### **SPECIAL SESSION A1L-A High-Performance Gyroscope Technologies**

08:00            *Invited*  
A1L-A1      **PRECISION NAVIGATION AND TIMING ENABLED BY MICROT TECHNOLOGY:  
ARE WE THERE YET?**  
A. Shkel  
*Defense Advanced Research Project Agency (DARPA), USA*

08:30  
A1L-A3      **ULTRA-PRECISE ROTATION SENSING WITH A SUPERLUMINAL RING LASER**  
S.M. Shahriar, H. Yum, Y. Wang, and J. Yablon  
*Northwestern University, USA*

08:45  
A1L-A4      **PRECISION INERTIAL FORCE SENSORS BASED ON ATOM INTERFEROMETRY**  
M. Kasevich  
*Stanford University, USA*

09:00  
A1L-A5      **NUCLEAR MAGNETIC RESONANCE GYROSCOPES**  
E.A. Donley  
*National Institute of Standards and Technology (NIST), USA*

09:15  
A1L-A6      **MICROMACHINED GYROSCOPES BASED ON A ROTATING MECHANICALLY  
UNCONSTRAINED PROOF MASS**  
M. Kraft and B. Damrongsak  
*University of Southampton, UK*

## SESSION A1L-B Nano Bio Sensors

08:00

A1L-B1 **COMPOSITE NANOMATERIAL FILM-BASED BIOSENSORS**  
Z. Gong, S. Karandikar, X. Zhang, V. Kotipalli, Y. Lvov, L. Que  
*Louisiana Technical University, USA*

08:15

A1L-B2 **A NOVEL L-LACTATE SENSOR BASED ON ENZYME ELECTRODE MODIFIED BY ZNO NANOPARTICLES AND MULTIWALL CARBON NANOTUBES**  
Y.T. Wang, W.J. Du, L. Lou, Z.Q. Zhu, J.Z. Zhu, and S.W. Wang  
*East China Normal University, CHINA*

08:30

A1L-B3 **HIGHLY-SENSITIVE THERMAL DETECTION OF THROMBIN USING APTAMER-FUNCTIONALIZED PHASE CHANGE NANOPARTICLES**  
C. Wang, M. Hossain, L. Ma, Z. Ma, and M. Su  
*University of Central Florida, USA*

08:45

A1L-B4 **SUSPENDED NANOPARTICLE CRYSTAL FOR SURFACE CHARGE SENSING**  
Y.H. Lei, W. Wang, W.G. Wu, and Z.H. Li  
*Peking University, CHINA*

09:00

A1L-B5 **A HIGHLY SELECTIVE MEDIATOR LESS GLUCOSE DETECTOR EMPLOYING VERTICALLY ALIGNED CARBON NANOFIBER (VACNF)**  
A.B. Islam, S.K. Islam, and T. Rahman  
*University of Tennessee, Knoxville, USA*

09:15

A1L-B6 **INTEGRATION OF VERTICALLY-ALIGNED CARBON NANOTUBE FORESTS IN MICROFLUIDIC DEVICES FOR MULTISCALE ISOLATION OF BIOPARTICLES**  
F. Fachin, G.D. Chen, M. Toner, and B.L. Wardle  
*Massachusetts Institute of Technology, USA*

## SESSION A1L-C Opto Chemical Sensors

08:00

A1L-C1 **DEVELOPMENT OF A MEMS-BASED RAMAN SPECTROMETER**  
T. Russin, M.S. Fralick, M.M. Kerber, A. Wang, and R.L. Waters  
*Space and Naval Warfare Systems Center Pacific, USA*

08:15

A1L-C2 **MULTIMODE FIBER MACH-ZEHNDER INTERFEROMETER FOR MEASUREMENT OF REFRACTIVE INDEX**  
C.-H. Chen<sup>1</sup>, Y.-C. Chen<sup>1</sup>, J.-N. Wang<sup>2</sup>, L.-K. Chau<sup>1</sup>, J.-L. Tang<sup>1</sup>, and W.-T. Wu<sup>3</sup>  
<sup>1</sup>National Chung Cheng University, TAIWAN, <sup>2</sup>National Yunlin University of Science and Technology, TAIWAN, and <sup>3</sup>National Pingtung University of Science and Technology, TAIWAN

08:30

A1L-C3 **MINIATURE INTERFEROMETER WITH CORNER CUBE MIRRORS**  
Y.M. Lee, M. Toda, M. Esashi, and T. Ono  
*Tohoku University, JAPAN*

- 08:45  
A1L-C4 **RAPID AND SENSITIVE OPTOCHEMICAL NITROGEN DIOXIDE DETECTION: SILICONE-CONTAINING AMPHIPHILIC CO-NETWORKS AS IMMOBILIZATION MATRICES FOR GAS SENSING**  
S. Meskath, G. Urban, and J. Heinze  
*University of Freiburg, GERMANY*
- 09:00  
A1L-C5 **FLUORESCENT GAS SENSORS BASED ON NANOPOROUS OPTICAL RESONATORS (MICROCAVITIES) INFILTRATED WITH SENSORY EMISSIVE POLYMERS**  
I.A. Levitsky and P.L. Ong  
*Emitech, Inc., USA*
- 09:15  
A1L-C6 **POLYMER (SU-8) OPTOFLUIDIC DEVICE WITH EMBEDDED HYDROGEL OXYGEN SENSING ELEMENTS**  
Z. Gao, D. Henthorn, and C.-S. Kim  
*Missouri University of Science and Technology, USA*

### **SPECIAL SESSION A1L-D Remote Powering for Biomedical Implants**

- 08:00 *Invited*  
A1L-D1 **A MM-SIZED IMPLANTABLE POWER RECEIVER WITH ADAPTIVE MATCHING**  
S.D. O'Driscoll  
*University of California, Davis, USA*
- 08:30  
A1L-D3 **A HIGH EFFICIENCY INDUCTIVE POWER LINK AND BACKWARD TELEMETRY FOR BIOMEDICAL APPLICATIONS**  
Q. Ma<sup>1</sup>, M.R. Haider<sup>1</sup>, and S.K. Islam<sup>2</sup>  
*<sup>1</sup>Sonoma State University, USA and <sup>2</sup>University of Tennessee, USA*
- 08:45  
A1L-D4 **INDUCTIVE POWER LINK FOR A WIRELESS CORTICAL IMPLANT WITH BIOCOMPATIBLE PACKAGING**  
K.M. Silay, C. Dehollain, and M. Declercq  
*Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*
- 09:00  
A1L-D5 **OPTIMAL FREQUENCIES FOR INDUCTIVE POWERING OF FULLY IMPLANTABLE BIOSENSORS FOR CHRONIC AND ELDERLY PATIENTS**  
O. Jacopo, S. Carrara, and G. De Micheli  
*Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*
- 09:15  
A1L-D6 **NOVEL TRIPLE-BAND BIOTELEMETRY SYSTEM WITH MINIATURIZED ANTENNA FOR IMPLANTABLE SENSING APPLICATIONS**  
C.L. Chang<sup>1</sup>, F.J. Huang<sup>1</sup>, C.M. Lee<sup>1</sup>, W.C. Ma<sup>1</sup>, H.Y. Huang<sup>2</sup>, and C.H. Luo<sup>1</sup>  
*<sup>1</sup>National Cheng Kung University, TAIWAN and <sup>2</sup>National Taipei University, TAIWAN*

### **SESSION A1L-E Silicon Photo Sensors**

- 08:00  
A1L-E1 **A NOVEL 3D OPTICAL PROXIMITY SENSOR PANEL AND ITS READOUT CIRCUIT**  
T.Y. Lin, W.D. Chen, C.P. Chao, C.H. Tsai, and S.C. Huang  
*National Chiao Tung University, TAIWAN*

- 08:15  
A1L-E2 **ARCHITECTURE OF 3D COMPRESSIVE ACQUISITION CMOS IMAGE SENSOR**  
M. Zhang and A. Bermak  
*Hong Kong University of Science and Technology, HONG KONG*
- 08:30  
A1L-E3 **A 64X64 PIXELS 30UW VISION SENSOR WITH BINARY DATA COMPRESSION**  
N. Massari, M. De Nicola, N. Cottini, and M. Gottardi  
*Fondazione Bruno Kessler, ITALY*
- 08:45  
A1L-E4 **A CMOS IMAGE SENSOR WITH CHARGE DOMAIN INTERLACE SCAN**  
Y. Xu<sup>1</sup>, A. Mierop<sup>1,2</sup>, and A. Theuwissen<sup>1,3</sup>  
<sup>1</sup>*Delft University of Technology, THE NETHERLANDS*, <sup>2</sup>*DALSA Professional Imaging, THE NETHERLANDS*,  
and <sup>3</sup>*Harvest Imaging, BELGIUM*
- 09:00  
A1L-E5 **SHORT-WAVE INFRARED NANO-INJECTION IMAGING SENSORS**  
O.G. Memis, J. Kohoutek, W. Wu, R.M. Gelfand, and H. Mohseni  
*Northwestern University, USA*
- 09:15  
A1L-E6 **OPTICAL STABILITY INVESTIGATION OF HIGH PERFORMANCE SILICON-BASED VUV PHOTODIODE**  
L. Shi<sup>1</sup>, F. Sarubbi<sup>1</sup>, S. Nihtianov<sup>2</sup>, L.K. Nanver<sup>1</sup>, and U. Kroth<sup>3</sup>  
<sup>1</sup>*Delft University of Technology, THE NETHERLANDS*, <sup>2</sup>*ASML Netherlands B.V., THE NETHERLANDS*, and  
<sup>3</sup>*Physikalisch-Technische Bundesanstalt (PTB), GERMANY*

## **SESSION A1L-F Sensors for Human Condition Monitoring**

- 08:00  
A1L-F1 **EXPERIMENTAL EMOTION RECOGNITION SYSTEM AND SERVICES USING A SENSOR ENABLED WPAN WATCH AND AN EMOTION RECOGNITION ENGINE EQUIPPED CELLULAR MOBILEPHONE**  
S.W. Lee<sup>1</sup>, C.S. Hong<sup>1</sup>, H.S. Shin<sup>2</sup>, and Y.K. Lee<sup>2</sup>  
<sup>1</sup>*Kyung Hee University, KOREA, SOUTH* and  
<sup>2</sup>*Electronics and Telecommunications Research Institute (ETRI), KOREA, SOUTH*
- 08:15  
A1L-F2 **USE OF WATER CLUSTER DETECTOR FOR PREVENTING DRUNK AND DROWSY DRIVING**  
M. Sakairi and M. Togami  
*Hitachi, Ltd., JAPAN*
- 08:30  
A1L-F3 **EMFI MATERIAL AS WEARABLE HEART RATE SENSOR FOR NIGHT TIME RECORDINGS**  
A. Vehkaoja, T. Salpavaara, J. Verho, and J. Lekkala  
*Tampere University of Technology, FINLAND*
- 08:45  
A1L-F4 **ESTIMATING MENTAL STRESS USING A WEARABLE CARDIO-RESPIRATORY SENSOR**  
J. Choi and R. Gutierrez-Osuna  
*Texas A&M University, USA*

09:00

A1L-F5 **PLATFORM FOR ALL-POLYMER-BASED PULSE-OXIMETRY SENSOR**  
Y. Chuo, B. Omrane, C. Landrock, J. Patel, and B. Kaminska  
*Simon Fraser University, CANADA*

09:15

A1L-F6 **SWEAT-ON-A-CHIP: ANALYSING SWEAT IN REAL TIME WITH DISPOSABLE MICRO-DEVICES**  
F. Benito Lopez, S. Coyle, R. Byrne, V. Curto, and D. Diamond  
*Dublin City University, IRELAND*

09:30 -  
11:30

**POSTER SESSION A4P-1**

**POSTER SESSION T1 - Phenomena, Modeling & Evaluation**

A2P-G1 **MODELING AND CHARACTERIZATION OF A MEMS G-SENSOR WITH ANTI-STICTION RAISED STRIPS FOR VIBRATION MONITORING SYSTEMS**  
Z.Q. Yang, G.F. Ding, H. Shen, H. Wang, and X.L. Zhao  
*Shanghai Jiao Tong University, CHINA*

A2P-G2 **DESIGN AND APPLICATION OF FLEXIBLE STOPS AT MEMS DEVICES**  
M. Naumann<sup>1</sup>, D. Lin<sup>2</sup>, J. Mehner<sup>1</sup>, and T. Miller<sup>2</sup>  
<sup>1</sup>*Chemnitz University of Technology, GERMANY* and <sup>2</sup>*Freescale Semiconductor Inc., USA*

A2P-G3 **ROBUST DESIGN OF MICROGYROSCOPE USING TOLERANCE ANALYSIS**  
H. Zhou, W. Su, X.X. Liu, and H.L. Tang  
*China Academy of Engineering Physics, CHINA*

A2P-G4 **HIGH EFFICIENCY PASSIVE MAGNETOELECTRIC TRANSDUCER CONSISTING OF PZT AND FE-NI FORK SUBSTRATE WITH HIGH Q VALUE**  
P. Li, Y. Wen, C. Jia, and X. Li  
*Chongqing University, CHINA*

A2P-G5 **MAGNETIC MODELING OF A MEMS FLUX CONCENTRATOR**  
G.A. Fischer, and A.S. Edelstein  
*US Army Research Laboratory, USA*

A2P-G6 **ELECTROMECHANICAL MODELING AND CHARACTERIZATION OF THE ELECTRICAL BREAKDOWN FOR THE CAPACITIVE MICRO-ARRAYED ULTRASONIC TRANSDUCERS**  
T.I. Chiu, S.B. Luo, and T.C. Hsiao  
*Industrial Technology Research Institute, TAIWAN*

A2P-G7 **RELIABLE PIEZOELECTRIC FEM-SIMULATIONS OF MEMS MICROPHONES: BASIS FOR INTRINSIC STRESS REDUCTION**  
T. Reutter and G. Schrag  
*Technische Universität München TUM, GERMANY*

A2P-G8 **CHARGE DRIFT IN GRAVIMETRIC CHEMICAL SENSORS**  
K.L. Dorsey and G.K. Fedder  
*Carnegie Mellon University, USA*

A2P-G9 **PRECISION MEASUREMENT OF HUMIDITY DEPENDENT PERMITTIVITY OF FOAMS**  
B. George, T. Bretterkieber, M. Neumayer, and H. Zangl  
*Graz University of Technology, AUSTRIA*

- A2P-G10 **NOVEL MEMS 900 MHZ ELECTROSTATIC SILICON DELAY LINE**  
M. Tabib-Azar<sup>1</sup>, K. Alzoubi<sup>2</sup>, and K. Yang<sup>1</sup>  
*<sup>1</sup>University of Utah, USA and <sup>2</sup>Case Western Reserve University, USA*
- A2P-G11 **POSITION SENSITIVE RADIATION DETECTOR INTEGRATED WITH A FIELD PROGRAMMABLE GATE ARRAY FOR RADIATION TOLERANT COMPUTING**  
B.J. LaMeres<sup>1</sup>, T. Kaiser<sup>1</sup>, E. Gowens<sup>1</sup>, T. Buerkle<sup>1</sup>, J. Price<sup>1</sup>, K. Helsley<sup>1</sup>, B. Peterson<sup>1</sup>, and R Ray<sup>2</sup>  
*<sup>1</sup>Montana State University, USA and <sup>2</sup>NASA Marshall Space Flight Center, USA*
- A2P-G12 **TOMOGRAPHY IMAGING IN SPEED-OF-LIGHT CONTRAST**  
K.B. Ozanyan<sup>1</sup>, P. Wright<sup>1</sup>, M. Stringer<sup>2</sup>, and R.E. Miles<sup>2</sup>  
*<sup>1</sup>University of Manchester, UK, and <sup>2</sup>University of Leeds, UK*
- A2P-G13 **ON-CHIP DETECTION OF BEADS WITH A NEW ELECTRICAL IMPEDANCE SENSOR USING A FLOATING ELECTRODE**  
L. Segerink, A.J. Sprenkels, J.G. Bomer, and A. van den Berg  
*University of Twente, THE NETHERLANDS*
- A2P-G14 **AN EARPAD SENSOR FOR ACOUSTIC FOOD TEXTURE RECOGNITION**  
O. Amft  
*Technische Universiteit Eindhoven, THE NETHERLANDS*
- A2P-G15 **THE ANALYSIS OF IGG-PROTEIN A BINDING EFFECT BY QUARTZ CRYSTAL MICROBALANCE BIOSENSOR**  
C.J. Cheng, C.T. Feng, and M.Z. Atashbar  
*Western Michigan University, USA*
- A2P-G16 **MODEL OF INTEGRATED MICRO PHOTOVOLTAIC CELL STRUCTURES FOR HARVESTING SUPPLIED MICROSYSTEMS IN 0.35- $\mu$ M CMOS TECHNOLOGY**  
M. Ferri, D. Pinna, M. Grassi, E. Dallago, and P. Malcovati  
*University of Pavia, ITALY*
- A2P-G17 **THE MICRO-DEVICES BASED ON SPECTRUM SHAPE DEFORMATION**  
E. Dai  
*Peking University, CHINA*
- A2P-G18 **TRANSITION BEHAVIOR IN LARGE DEFLECTION OF ELASTICALLY-BOSSSED SENSOR PLATE UNDER INITIAL TENSION**  
C. Chen, and N. Gao  
*Chung-Hua University, TAIWAN*

## **POSTER SESSION T2 - Chemical & Gas Sensors**

- A2P-H1 **EXTENDED LAMBÕS MODEL APPLICATION TO HIGH-ORDER RESONANCES OF MICROMACHINED CIRCULAR MEMBRANES WITH INTEGRATED ACTUATION AND SENSING CAPABILITIES**  
T. Alava, F. Mathieu, C. Soyer, D. Remiens, and L. Nicu  
*Centre National de la Reserche Scientifique (CNRS), FRANCE*
- A2P-H2 **INTELLIGENT SENSING FOR FALSE ALARM REDUCTION**  
D. Tahmoush and J. Silvius  
*US Army Research Laboratory, USA*
- A2P-H3 **A CLOSED-LOOP SWITCHED-CAPACITOR INTERFACE FOR HIGH-QUALITY MICROACCELEROMETER**  
Z.H. Ye, H.G. Yang, T. Yin, Y. Wang, Q.S. Wu, C. Zhang, and F. Liu  
*Chinese Academy of Sciences, CHINA*

- A2P-H4 **NOVEL DIGITAL MICROFLUIDIC SYSTEM USING A SURFACE ACOUSTIC WAVE DEVICE**  
T. Sugita and J. Kondoh  
*Shizuoka University, JAPAN*
- A2P-H5 **A LATERALLY DRIVEN CAPACITIVE RF MEMS SWITCH USING PARYLENE AS DIELECTRIC LAYER**  
X.J. He, Z.Q. Lv, B. Liu, and Z.H Li  
*Peking University, CHINA*
- A2P-H6 **AN ULTRA-LOW INPUT VOLTAGE POWER MANAGEMENT CIRCUIT FOR INDOOR MICRO-LIGHT ENERGY HARVESTING SYSTEM**  
H. Yu, H.Z. Wu, and Y.M. Wen  
*Chongqing University, CHINA*
- A2P-H7 **MICRO-OPTICS ASSEMBLY IN DENTAL DRILL AS A PLATFORM FOR IMAGING AND SENSING DURING SURGICAL DRILLING**  
D. Wicaksono, E. Margallo-Balbas, G. Pandraud, P. French, P. Breedveld, J. Dankelman  
*Delft University of Technology, THE NETHERLANDS*
- A2P-H8 **LOW-TEMPERATURE ANODIC BONDING OF SILICON AND QUARTZ CRYSTAL WAFERS FOR MEMS APPLICATIONS**  
Y.L. Zimin and T. Ueda  
*Waseda University, JAPAN*
- A2P-H9 **MULTIPHASE FLOW RECONSTRUCTION IN OIL PIPELINES BY PORTABLE CAPACITANCE TOMOGRAPHY**  
E.J. Mohamad<sup>1</sup> and R. Abdul Rahim<sup>2</sup>  
*<sup>1</sup>Universiti Tun Hussien Onn Malaysia, MALAYSIA and <sup>2</sup>Universiti Teknologi Malaysia, MALAYSIA*
- A2P-H10 **PALM-SIZED FLOW-INJECTION-ANALYSIS FOR DETECTING FERRIC IONS**  
S. Gassmann and L. Pagel  
*University of Rostock, GERMANY*
- A2P-H11 **A COMBINED ANGLE OF ATTACK AND ANGLE OF SIDESLIP SMART PROBE WITH TWIN DIFFERENTIAL SENSOR MODULES AND DOUBLED OUTPUT SIGNALS**  
P. Paces<sup>1</sup>, V. Hanzal<sup>2</sup>, K. Draxler<sup>1</sup>, T. Censky<sup>1</sup>, and O. Vasko<sup>3</sup>  
*<sup>1</sup>Czech Technical University, Prague, CZECH REPUBLIC, <sup>2</sup>Aeronautical Research and Test Institute, CZECH REPUBLIC, and <sup>3</sup>MEACONT Praha spol. s r.o., CZECH REPUBLIC*
- A2P-H12 **A STUDY ON THE FAULT DIAGNOSIS ANALYSIS OF VARIABLE RELUCTANCE RESOLVER FOR ELECTRIC VEHICLES**  
K.C. Kim, K.Y. Sung, and S.J. Hwang  
*Hanbat National University, KOREA, SOUTH*
- A2P-H13 **A MEMS NANOPositioner WITH THERMAL ACTUATOR AND ON-CHIP THERMAL SENSOR**  
Y. Zhu, R. Moheimani, and M. Yuce  
*University of Newcastle, AUSTRALIA*
- A2P-H14 **HIGH TEMPERATURE VIBRATION ENERGY HARVESTER SYSTEM**  
S. Barker, N.G. Wright, and A.B. Horsfall  
*Newcastle University, UK*
- A2P-H15 **DETECTION AND REMOVAL OF DROPLETS ON NON-PIEZOELECTRIC SUBSTRATES VIA MODE CONVERSION OF LAMB WAVES**  
M. Schmitt, S. Stich, S. Fromm, F. Fischer, and G. Lindner  
*Coburg University, GERMANY*

- A2P-H16 **A MULTI-TOUCH INTERFACE CIRCUIT FOR LARGE SIZE PROJECTED CAPACITIVE TOUCH PANELS**  
J.Y. Ruan, C.P. Chao, and W.D. Chen  
*National Chiao Tung University, TAIWAN*
- A2P-H17 **HYDROPHONE BASED ON INTENSITY MODULATED DFB FIBER LASER**  
J.Z. Zhang<sup>1</sup>, X.L. Li<sup>1</sup>, Q. Chai<sup>1</sup>, Q.Q. Hao<sup>1</sup>, Q. Li<sup>1</sup>, W.M. Sun<sup>1</sup>, L.B. Yuan<sup>1</sup>, P. Lu<sup>2</sup>, and G.D. Peng<sup>3</sup>  
<sup>1</sup>Harbin Engineering University, CHINA, <sup>2</sup>Communications Research Centre, CHINA, and <sup>3</sup>University of New South Wales, AUSTRALIA
- A2P-H18 **A DESIGN OF COMPRESSIVE ELETROENCEPHALOGRAPHY SENSORS**  
Q. Hao and F. Hu  
*University of Alabama, USA*
- A2P-J1 **VISUAL DETECTION OF MERCURY VAPOR USING PLASMONIC NANOPARTICLE ARRAY**  
C.M. Wang, L.Y. Ma, M. Hossain, and M. Su  
*University of Central Florida, USA*
- A2P-J2 **ENHANCING HYDROFLUORIC ACID SENSITIVITY IN SILICON POLYMER COMPOSITES THROUGH TiO<sub>2</sub> BLENDING**  
C.M. Washburn, S.M. Dirk, T.N. Lambert, G.W. Yelton, R.R. Boye, D.A. Scrymgeour, D.R. Wheeler, and B.G. Hance  
*Sandia National Laboratories, USA*
- A2P-J3 **EFFECT OF SiO<sub>2</sub> ADDITIVE AS INHIBITOR ON CRYSTALLINE STRUCTURE AND H<sub>2</sub>S SENSING PERFORMANCE OF CuO-Au-SnO<sub>2</sub> THIN FILM PREPARED BY LIQUID PHASE DEPOSITION**  
J.-C. Chiou<sup>1</sup>, S.-W. Tsai<sup>1</sup> and C.-T. Huang<sup>2</sup>  
<sup>1</sup>National Chiao Tung University, TAIWAN, and <sup>2</sup>Oriental System Technology, TAIWAN
- A2P-J4 **A FUZZY ENTROPY BASED NEURAL NETWORK CLASSIFIER FOR ODOR IDENTIFICATION OF ALCOHOLIC BEVERAGES USING TIN OXIDE SENSOR ARRAY**  
R. Kumar, R.R. Das, V.N. Mishra, and R. Dwivedi  
*Banaras Hindu University, Varanasi, INDIA*
- A2P-J5 **ODOR SENSING SYSTEM USING BALL SAW DEVICES FUNCTIONALIZED WITH SELF-ASSEMBLED LIPID-DERIVATIVES AND GC MATERIALS**  
B. Wyszynski<sup>1</sup>, T. Nakamoto<sup>1</sup>, S. Akao<sup>2</sup>, and N. Nakaso<sup>2</sup>  
<sup>1</sup>Tokyo Institute of Technology, JAPAN and <sup>2</sup>Toppan Printing Corporation, JAPAN
- A2P-J6 **TRIMETHYLAMINE DETECTION USING MICROCANTILEVER CHEMICAL SENSORS FUNCTIONALIZED WITH A SELF-ASSEMBLED MONOLAYER**  
R. Yang, Y. Zhou, Z. Wang, and L. Lliu  
*Tsinghua University, CHINA*
- A2P-J7 **FABRICATION AND CHARACTERISTICS OF Pt/ZNO NO SENSOR INTEGRATED 3C-SiC MICRO HEATER**  
J. Shim and G. Chung  
*University of Ulsan, KOREA, SOUTH*
- A2P-J8 **PT/MO<sub>3</sub> NANO-FLOWER/SiC SCHOTTKY DIODE BASED HYDROGEN GAS SENSOR**  
M. Shafiei<sup>1</sup>, J. Yu<sup>1</sup>, M. Breedon<sup>1</sup>, R. Kaner<sup>2</sup>, K. Galatsis<sup>2</sup>, K. Kalantar-Zadeh<sup>1</sup>, and W. Wlodarski<sup>1</sup>  
<sup>1</sup>Royal Melbourne Institute of Technology (RMIT), AUSTRALIA and <sup>2</sup>University of California, Los Angeles, USA
- A2P-J9 **A LOW-HYSTERESIS AND HIGH-SENSITIVITY EXTENDED GATE FET-BASED CHLORIDE ION-SELECTIVE SENSOR**  
C.- Hsieh, W.E.I.-C. Chang, and I.-Y.U. Huang  
*National Sun Yat-sen University, TAIWAN*

- A2P-J10 **GRAPHENE AS ION SENSITIVE FILM FOR IONIC LIQUIDS**  
A. Kulkarni, H. Kim, H. Zang, J. Choi, B. Hong, and T. Kim  
*Sungkyunkwan University, KOREA, SOUTH*
- A2P-J11 **A MICROFABRICATED CARBON DIOXIDE SENSOR FOR PORTABLE APPLICATIONS**  
B.A. Rosen, A. Salehi-Khojin, and R.I. Masel  
*University of Illinois, Urbana-Champaign, USA*
- A2P-J12 **GUIDED SH-SAW TOLUENE SENSORS WITH MESOPOROUS SILICA SENSITIVE COATINGS: INCREASED SENSITIVITY THROUGH MESOSTRUCTURATION CONTROL**  
A. Tetelin<sup>1</sup>, G. Tortissier<sup>1</sup>, L. Blanc<sup>1</sup>, C. Boissière<sup>2</sup>, J.-L. Lachaud<sup>1</sup>, C. Dejous<sup>1</sup>, and D. Rebière<sup>1</sup>  
<sup>1</sup>*Université de Bordeaux, FRANCE* and <sup>2</sup>*Université Pierre et Marie Curie, FRANCE*
- A2P-J13 **MICROCANTILEVER SENSORS APPLICATIONS IN THE PETROLEUM INDUSTRY**  
D.G. Yablon, and A.M Schilowitz  
*ExxonMobil, USA*
- A2P-J14 **A HYDROGEN SENSOR BASED ON ORIENTED GRAPHITIC CARBON**  
A. Moafi<sup>1</sup>, M. Shafiei<sup>1</sup>, A.Z. Sadek<sup>1</sup>, D.M. Lau<sup>1</sup>, J.G Partridge<sup>2</sup>, K. Kalantar-Zadeh<sup>1</sup>, W. Wlodarski<sup>1</sup>, and D.G. McCulloch<sup>1</sup>  
<sup>1</sup>*Royal Melbourne Institute of Technology (RMIT), AUSTRALIA* and <sup>2</sup>*University of Canterbury, NEW ZEALAND*
- A2P-J15 **A CMOS INTERDIGITAL CAPACITIVE HUMIDITY SENSOR WITH POLYSILICON HEATERS**  
C. Zhao, Q.A. Huang, M. Qin, and W. Li  
*Southeast University, CHINA*
- A2P-J16 **HIGHLY DISPERSED AU NANOPARTICLES ON NITROGEN DOPED CARBON NANOTUBES FOR HYDROGEN SENSING**  
A.Z. Sadek<sup>1</sup>, C. Zheng<sup>1</sup>, D.W. Lau<sup>1</sup>, D.G. McCulloch<sup>1</sup>, Z. Hu<sup>2</sup>, W. Wlodarski<sup>1</sup>, and K. Kalantar-Zadeh<sup>1</sup>  
<sup>1</sup>*Royal Melbourne Institute of Technology (RMIT), AUSTRALIA*, and <sup>2</sup>*Nanjing University, CHINA*
- A2P-J17 **BEHAVIOUR OF A CATALYTIC COMBUSTION METHANE GAS SENSOR WORKING ON PULSE MODE**  
L. Xu<sup>1</sup>, T. Li<sup>1</sup>, R. Zheng<sup>2</sup>, L. Xie<sup>2</sup>, L. Lee<sup>2</sup>, G. Gao<sup>1</sup>, and Y. Wang<sup>1</sup>  
<sup>1</sup>*Chinese Academy of Science, CHINA* and <sup>2</sup>*RAE Systems, CHINA*

#### **POSTER SESSION T4 - Biosensors**

- A2P-K1 **A VISCOSITY AND C-REACTIVE PROTEIN SENSING TECHNIQUE BASED ON BROWNIAN MOTION MEASUREMENTS BY TOTAL-INTERNAL-REFLECTIVE-FLUORESCENT VELOCIMETRY**  
Y.J. Fan, Y.H. Liu, T.H. Wu, H.J. Sheen, S. Lin, and J.F. Tsai  
*National Taiwan University, TAIWAN*
- A2P-K2 **PHAGE LANGMUIR-BLODGETT FILMS FOR BIOSENSING APPLICATIONS**  
R. Guntupalli<sup>1</sup>, I. Sorokulova<sup>1</sup>, R. Long<sup>1</sup>, E. Olsen<sup>2</sup>, W. Neely<sup>1</sup>, and V. Vodyanoy<sup>1</sup>  
<sup>1</sup>*Auburn University, USA* and <sup>2</sup>*Keesler Air Force Base, USA*
- A2P-K3 **ELECTROCHEMICAL BIOSENSOR FOR THE DETECTION OF FORMALDEHYDE BASED ON ENCAPSULATION OF AN ENZYME, INTO THE NANOPOROUS-WALLED SILICA NANOTUBE-INORGANIC COMPOSITE MEMBRANE**  
T. Itoh<sup>1</sup>, T. Shimomura<sup>2</sup>, T. Hanaoka<sup>1</sup>, M. Omo<sup>2</sup>, and F. Mizukami<sup>1</sup>  
<sup>1</sup>*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN* and <sup>2</sup>*Funai Electric Advanced Applied Technology Research Institute Inc, JAPAN*

- A2P-K4     **LABEL-FREE IMMUNOSENSOR USING A GOLD ELECTRODE COVERED WITH CONDUCTIVE SELF-ASSEMBLED MONOLAYER**  
K. Takoh, M. Horie, H. Someya, M. Ishida, and K. Kamijo  
*NEC Corporation, JAPAN*
- A2P-K5     **SILICON NANOWIRES FOR HIGH-SENSITIVITY CRP DETECTION**  
M.H. Lee<sup>1</sup>, S.W. Jung<sup>1</sup>, S.D. Lee<sup>2</sup>, and W.K. Seong<sup>1</sup>  
*<sup>1</sup>Korean Electronics Technology Institute, KOREA, SOUTH and <sup>2</sup>IM, KOREA, SOUTH*
- A2P-K6     **CMOS OPEN-GATE ION SENSITIVE FIELD EFFECT TRANSISTORS FOR FEMTO-MOLAR DOPAMINE DETECTION**  
D. Li and M. Lu  
*National Tsing Hua University, TAIWAN*
- A2P-K7     **CONVECTIVE FLOWS IN 3-DIMENSIONAL MICROFLUIDIC NETWORKS INDUCED BY LOCALIZED MICROWAVE HEATING**  
W. Hilber, C. Diskus, T. Lederer, and B. Jakoby  
*Johannes Kepler University, AUSTRIA*
- A2P-K8     **DETECTION OF MONOCLONAL ANTIBODIES USING CHEMICALLY MODIFIED GRAPHITE SUBSTRATES**  
Z. Tehrani, O. Guy, A. Castaing, and S. Doak  
*Swansea University, UK*
- A2P-K9     **DETECTION OF PROTEIN BINDING DNA MOLECULES BY USING OPTICAL BIOSENSOR DEVICES**  
M. Chathirat<sup>1</sup>, M.R. Atthi<sup>2</sup>, M.R. Hruanun<sup>2</sup>, M.R. Poyai<sup>2</sup>, M.R. Osotchan<sup>1</sup>, and M.R. Dangtip<sup>1</sup>  
*<sup>1</sup>Mahidol University, THAILAND and <sup>2</sup>Thai Microelectronic Center (TMEC), THAILAND*
- A2P-K10    **ULTRA-SENSITIVE CYTOMETRIC DETECTION OF RARE PARTICLE ON MICROFLUIDIC DEVICE**  
C. Mu<sup>1</sup>, F. Zhang<sup>1</sup>, Z. Zhang<sup>2</sup>, M. Lin<sup>3</sup>, and X. Cao<sup>1</sup>  
*<sup>1</sup>University of Ottawa, CANADA, <sup>2</sup>National Research Council, CANADA, and <sup>3</sup>Canadian Food Inspection Agency, CANADA*
- A2P-K11    **DEVELOPMENT OF MICROPACKAGE TECHNOLOGY FOR BIOMEDICAL IMPLANTABLE MICRODEVICES USING PARYLENE C AS WATER VAPOR BARRIER COATINGS**  
H. Kuo, R. Zhang, and W. Ko  
*Case Western Reserve University, USA*
- A2P-K12    **MICROPIPETTE-BASED THERMAL SENSOR FOR BIOLOGICAL APPLICATIONS**  
R. Shrestha<sup>1</sup>, W.S. Chang<sup>2</sup>, and T.Y. Choi<sup>1</sup>  
*<sup>1</sup>University of North Texas, USA, and <sup>2</sup>Korea Institute of Machinery & Materials (KIMM), KOREA, SOUTH*
- A2P-K13    **A SURFACE PLASMON RESONANCE SENSOR FOR QUANTITATIVE ANALYSIS OF CALCIFICATION OF OSTEOBLAST CELLS**  
S.A. Kim<sup>1</sup>, S. Das<sup>1</sup>, H.W. Lee<sup>1</sup>, J.H. Kim<sup>1</sup>, Y.M. Song<sup>1</sup>, I.S. Kim<sup>1</sup>, K.M. Byun<sup>2</sup>, S.J. Hwang<sup>1</sup>, and S.J. Kim<sup>1</sup>  
*<sup>1</sup>Seoul National University, KOREA, SOUTH and <sup>2</sup>Kyung Hee University, KOREA, SOUTH*
- A2P-K14    **NOVEL NANOSTRUCTURED PLATFORM AND NANOPARTICLES FOR SENSITIVE DETECTION OF BIOLOGICAL MATERIALS**  
S. Bok, V. Korampally, L. Polo-Parada, W.R. Folk, K. Gangopadhyay, and S. Gangopadhyay  
*University of Missouri, Columbia, USA*

- A2P-K15    **INTEGRATION OF PLASMONIC DEVICES ON QUANTUM CASCADE LASER FACETS FOR CHIP-SCALE MOLECULAR SENSING**  
H. Mohseni, D. Dey, R. Gelfand, and J. Kohoutek  
*Northwestern University, USA*
- A2P-K16    **8X8 CMOS THERMAL SENSORS FOR ENZYMATIC GLUCOSE DETECTION**  
P. Wang and M. Lu  
*National Tsing Hua University, TAIWAN*
- A2P-K17    **AMPEROMETRIC GLUCOSE BIOSENSOR BASED ON PT-POLYANILINE NANOCOMPOSITE ON BORON-DOPED DIAMOND THIN FILM**  
M.J. Song<sup>1</sup>, J.H. Kim<sup>1</sup>, S.K. Lee<sup>1</sup>, D.S. Lim<sup>1</sup>, S.W. Hwang<sup>1</sup>, and D.M. Whang<sup>2</sup>  
*<sup>1</sup>Korea University, KOREA, SOUTH and <sup>2</sup>Sungkyunkwan University*
- A2P-K18    **A MICROSYSTEM FOR HIGH RESOLUTION MEASUREMENT OF CELL FORCES**  
J. Vázquez<sup>1</sup>, J. Hedley<sup>2</sup>, M.A. Birch<sup>2</sup>, and C. Redfern<sup>2</sup>  
*<sup>1</sup>Universidad de Castilla-La Mancha, SPAIN and <sup>2</sup>Newcastle University, UK*
- A2P-K19    **SANDWICH STRUCTURE ELECTROCHEMICAL ASSAY FOR SINGLE STRANDED DNA DETECTION**  
I.J. Chen and I. White  
*University of Maryland, USA*
- A2P-K20    **AN OPTICAL MEASUREMENT USING THE DNA HYBRIDIZATION METHOD FOR SPECIFIC SPECIES OF BACTERIA DETECTION**  
Y.C. Lin, C.H. Yeh, Y.H. Chang, H.P. Lin, and T.C. Chang  
*National Cheng Kung University, TAIWAN*

## **POSTER SESSION T5 - Optical Sensors**

- A2P-L1    **NEW LOW COST ANALOG SELF-MIXING VIBROMETER**  
M. Norgia and A. Pesatori  
*Politecnico di Milano, ITALY*
- A2P-L2    **NOVEL FAST LASER-BASED AUTO-FOCUSING MICROSCOPE**  
C.S. Liu, P.H. Hu, Y.H. Wang, S.S. Ke, Y.C. Lin, Y.H. Chang, and J.B. Horng  
*Industrial Technology Research Institute, TAIWAN*
- A2P-L3    **DUAL-CONFOCAL AUTO-FOCUS SENSING SYSTEM IN ULTRAFAST LASER APPLICATION**  
Y.H. Wang, P.H. Hu, Y.C. Lin, S.S. Ke, Y.H. Chang, C.H. Liu, and J.B. Horng  
*Industrial Technology Research Institute, TAIWAN*
- A2P-L4    **NEAR-FIELD GRATING FOR HIGH-SPEED LASER DOPPLER VELOCIMETRY**  
M. Norgia  
*Politecnico di Milano, ITALY*
- A2P-L5    **HIGH-PERFORMANCE INSPECTING SYSTEM FOR DETECTING MICRO-CRACK DEFECTS OF SOLAR WAFER**  
S.S. Ke, K.W. Lin, Y.C. Lin, J.T. Chen, C.S. Liu, and Y.H. Wang  
*Industrial Technology Research Institute, TAIWAN*
- A2P-L6    **TECHNIQUE ENHANCING DETECTION SENSITIVITY OF ALCOHOL INTAKE BY DIVIDING PHOTOPLETHYSMOGRAM SIGNALS**  
M.R. Fukuda, MR. Shimizu, and P. Omura  
*Kansai University, JAPAN*

- A2P-L7 **AN IMPROVED LARGE AREA-TYPE OPTICAL SENSOR USING FROSTED GLASS**  
Y. Kitazono<sup>1</sup>, S. Hossain<sup>1</sup>, S. Nakashima<sup>2</sup>, L. Zhang<sup>1</sup>, and S. Serikawa<sup>1</sup>  
<sup>1</sup>*Kyushu Institute of Technology, JAPAN* and <sup>2</sup>*Ube National College of Technology, JAPAN*
- A2P-L8 **IMPROVEMENT IN THE SENSITIVITY OF DYE-DOPED POF-TYPE MOISTURE SENSOR**  
M. Morisawa and H. Yokomori  
*University of Yamanashi, JAPAN*
- A2P-L9 **A VARIABLE TOPOLOGY PARTITIONED PIXEL AMPLIFIER FOR LOW AND HIGH LIGHT LEVEL DETECTION IN A CMOS IMAGER**  
Y. Dattner, and O. Yadid-Pecht  
*University of Calgary, CANADA*
- A2P-L10 **OPTICAL DISPLACEMENT SENSOR BASED ON NOVEL SELF-MIXING RECONSTRUCTION METHOD**  
A. Magnani, M. Norgia, and A. Pesatori  
*Politecnico di Milano, ITALY*
- A2P-L11 **CHARACTERIZATION OF HIGH QUALITY ZNO NANOWIRE SURFACE PLASMON RESONANCE SENSORS ON SI SUBSTRATE WITH PERFORATED ALUMINUM CYLINDRICAL MICROPILLAR ARRAY**  
J.C. Wang and T.E. Nee  
*Chang Gung University, TAIWAN*
- A2P-L12 **HIGH SENSITIVITY SAW UV SENSOR BY USING THIRD HARMONIC BASED ON ZNO/SI STRUCTURE**  
D. Phan and G. Chung  
*University of Ulsan, KOREA, SOUTH*
- A2P-L13 **A NOISE PROPAGATION MODEL FOR A 3X3 OPTICAL DEMODULATION SCHEME**  
M.D. Todd  
*University of California, San Diego, USA*
- A2P-L14 **APEX - CURRENT STATUS, PERFORMANCE AND PRODUCT GENERATION**  
M. Jehle<sup>1</sup>, A. Hueni<sup>1</sup>, A. Damm<sup>1</sup>, P. D'Dodorigo<sup>1</sup>, M. Kneubühler<sup>1</sup>, K. Meuleman<sup>2</sup>, D. Schläpfer<sup>3</sup>, M.E. Schaeppman<sup>1</sup>, and J. Weyermann<sup>1</sup>  
<sup>1</sup>*University of Zurich, SWITZERLAND*, <sup>2</sup>*VITO - Flemish Institute for Technological Research, BELGIUM*, and <sup>3</sup>*Rese Applications Schläpfer, SWITZERLAND*
- A2P-L15 **FIBRE OPTIC PRESSURE AND TEMPERATURE SENSOR FOR GEOTHERMAL WELLS**  
K. Bremer<sup>1</sup>, E. Lewis<sup>1</sup>, G. Leen<sup>1</sup>, B. Moss<sup>1</sup>, S. Lochmann<sup>2</sup>, I. Mueller<sup>2</sup>, T. Reinsch<sup>3</sup>, and J. Schroetter<sup>3</sup>  
<sup>1</sup>*University of Limerick, IRELAND*, <sup>2</sup>*HS Wismar, GERMANY*, and <sup>3</sup>*GFZ German Research Centre for Geosciences, Potsdam, GERMANY*
- A2P-L16 **THE FIBER-OPTIC CURRENT SENSOR USING AN INTERNAL TRIGGER SAMPLING TECHNIQUE**  
H.J. Park<sup>1</sup>, H.J. Kim<sup>2</sup>, and M. Song<sup>2</sup>  
<sup>1</sup>*Electronics and Telecommunications Research Institute (ETRI), KOREA, SOUTH* and <sup>2</sup>*Chonbuk National University, KOREA, SOUTH*
- A2P-L17 **NEAR-INFRARED SPECTROSCOPY IN THE ANALYSIS OF FUNCTIONAL BRAIN ACTIVITY DURING COGNITIVE TASKS**  
B. Abibullaev<sup>1</sup>, S.H. Lee<sup>1</sup>, W.S. Kang<sup>1</sup>, J. An<sup>1</sup>, and H.D. Seo<sup>2</sup>  
<sup>1</sup>*Daegu Gyeongbuk Institute of Science and Technology, KOREA, SOUTH* and <sup>2</sup>*Yeungnam University, KOREA, SOUTH*

- A2P-L18 **MEASUREMENT AND ANALYSIS ON CHARACTERISTICS OF TRANSMISSION AND POLARIZATION FOR 12ML 65NM CMOS**  
M. Ikeda and Y. Kim  
*University of Tokyo, JAPANJAPAN*
- A2P-L19 **A NEW DESIGN OF HIGH PRECISION SOLAR MICROSENSOR FOR SATELLITE APPLICATIONS**  
F. Delgado<sup>1</sup>, P. Ortega<sup>2</sup>, C.L. Tarrida<sup>1</sup>, J. García<sup>1</sup>, M. Angulo<sup>3</sup>, and J.M. Quero<sup>1</sup>  
<sup>1</sup>*University of Seville, SPAIN*, <sup>2</sup>*Politechnique University of Barcelona, SPAIN*, and  
<sup>3</sup>*Instituto Nacional de Técnica Aeroespacial, SPAIN*

## **POSTER SESSION T6 - Mechanical & Physical Sensors**

- A2P-M1 **DESIGN AND CHARACTERIZATION OF A MOBILE FORCE PLATE AND THREE-DIMENSIONAL MOTION ANALYSIS SYSTEM**  
T. Liu<sup>1</sup>, Y. Inoue<sup>1</sup>, K. Shibata<sup>1</sup>, and K. Shiojima<sup>2</sup>  
<sup>1</sup>*Kochi University of Technology, JAPAN* and <sup>2</sup>*TEC GIHAN Co., LTD, JAPAN*
- A2P-M2 **PIEZO-RESISTIVE RESPONSE OF FIVE-CONTACT VERTICAL HALL DEVICES**  
T. Kaufmann, D. Kopp, F. Purkl, M. Baumann, P Ruther, and O. Paul  
*University of Freiburg - IMTEK, GERMANY*
- A2P-M3 **ELECTRO-THERMAL MICROCANTILEVER WITH INTEGRATED SOLID-STATE HEATER, CONDUCTIVE TIP, AND SCHOTTKY DIODE**  
N. Maniscalco, and W. King  
*University of Illinois, Urbana-Champaign, USA*
- A2P-M4 **HIGH SENSITIVITY SLIP SENSOR USING PRESSURE CONDUCTIVE RUBBER FOR DEXTEROUS GRASP AND MANIPULATION**  
S. Teshigawara<sup>1</sup>, S. Shimizu<sup>1</sup>, Y. Suzuki<sup>1</sup>, A. Ming<sup>1</sup>, M. Ishikawa<sup>2</sup>, and M. Shimojo<sup>3</sup>  
<sup>1</sup>*University of Electro-Communications, JAPAN*, <sup>2</sup>*University of Tokyo, JAPAN*, and  
<sup>3</sup>*University of Electro-Communications, JAPAN*
- A2P-M5 **THERMOELECTRIC FLOW SENSORS ON FLEXIBLE SUBSTRATES AND THEIR INTEGRATION PROCESS**  
H. Sturm<sup>1</sup>, E. Brauns<sup>1</sup>, K. Froehner<sup>1</sup>, R. Buchner<sup>2</sup>, and W. Lang<sup>1</sup>  
<sup>1</sup>*University of Bremen, GERMANY* and <sup>2</sup>*Danfoss IXA A/S, DENMARK*
- A2P-M6 **SMART FLOW SENSOR COMBINING FREQUENCY, DUTY-CYCLE, AND AMPLITUDE OUTPUT**  
S. Cerimovic<sup>1</sup>, S. Dalola<sup>2</sup>, F. Kohl<sup>3</sup>, T. Sauter<sup>3</sup>, V. Ferrari<sup>2</sup>, D. Marioli<sup>2</sup>, and F. Keplinger<sup>1</sup>  
<sup>1</sup>*Vienna University of Technology, AUSTRIA*, <sup>2</sup>*University of Brescia, ITALY*, and  
<sup>3</sup>*Austrian Academy of Sciences, AUSTRIA*
- A2P-M7 **COMPARATIVE STUDY OF SAW TEMPERATURE SENSOR BASED ON DIFFERENT PIEZOELECTRIC MATERIALS AND CRYSTAL CUTS FOR PASSIVE WIRELESS MEASUREMENT**  
X.S. Ye, Q. Wang, L. Fang, X.J. Wang, and B. Liang  
*Zhejiang University, CHINA*
- A2P-M8 **A TACTILE PROXIMITY SENSOR**  
D. Goeger, M. Blankertz, and H. Woern  
*Karlsruhe Institute of Technology, GERMANY*
- A2P-M9 **THERMAL ASYMMETRY COMPENSATION OF A WIND SENSOR FABRICATED ON CERAMIC SUBSTRATE**  
Z. Dong, Q.A. Huang, and M. Qin  
*Southeast University, CHINA*

- A2P-M10 **AN EFFICIENT CALIBRATION METHOD FOR A NOVEL 6-DOF ACCELERATION SENSOR SYSTEM AND APPLICATION TO MEASUREMENT OF A VEHICLE MOTION**  
R. Onodera<sup>1</sup>, N. Mimura<sup>2</sup>, and M. Shishido<sup>1</sup>  
*<sup>1</sup>Tsuruoka National College of Technology, JAPAN and <sup>2</sup>Niigata University, JAPAN*
- A2P-M11 **PIEZOTRANSISTOR-EMBEDDED MICROCANTILEVER PLATFORM FOR STRAIN SENSING APPLICATIONS**  
P.R. Singh and J. Miao  
*Nanyang Technological University, SINGAPORE*
- A2P-M12 **TWO-FREQUENCY COMBINATION IN ULTRASONIC MEASUREMENT ON A SPARSE PHASED ARRAY USING TUNABLE MICROSENSORS**  
K. Yamashita, K. Yoshikawa, K. Tomiyama, P. Lorchorchoonkul, and M. Noda  
*Kyoto Institute of Technology, JAPAN*
- A2P-M13 **MAGNETOELECTRIC SENSORS WITH DIRECTLY INTEGRATED MICROELECTRONICS -- IMPROVED FIELD SENSITIVITY AND SIGNAL-TO-NOISE RATIO**  
Z. Fang, F. Li, N. Mokhariwale, S. Datta, and Q.M. Zhang  
*Pennsylvania State University, USA*
- A2P-M14 **APPROACH FOR SUB PT, ROOM TEMPERATURE MAGNETIC SENSORS**  
A. Edelstein<sup>1</sup>, G. Fischer<sup>1</sup>, J. Fine<sup>1</sup>, D. Viehland<sup>2</sup>  
*<sup>1</sup>US Army Research Laboratory, USA, <sup>2</sup>Virginia Polytechnic Institute and State University, USA*
- A2P-M15 **LATERAL FIELD EXCITATION FILM BULK ACOUSTIC RESONATOR AS INFRARED SENSOR**  
X. Qiu, Z. Wang, R. Tang, J. Zhu, J. Oiler, and H. Yu  
*Arizona State University, USA*
- A2P-M16 **A LATERAL-AXIS TUNING FORK GYROSCOPE WITH COMBINED SENSING CAPACITORS AND DECOUPLED COMB DRIVE**  
Z.Y. Guo<sup>1</sup>, Z.Y. Chen<sup>2</sup>, Q. Zhao<sup>1</sup>, L.T. Lin<sup>1</sup>, J. Cui<sup>1</sup>, Z.C. Yang<sup>1</sup>, and G.Z. Yan<sup>1</sup>  
*<sup>1</sup>Peking University, CHINA and <sup>2</sup>Tsinghua University, CHINA*
- A2P-M17 **QUANTITATIVE ANALYSIS AND DECOUPLING OF MASS AND STIFFNESS EFFECTS IN CANTILEVER MASS SENSORS**  
H. Sadeghian, C.K. Yang, J.F.L. Goosen, A. Bossche, P.J. French, and F. van Keulen  
*Delft University of Technology, THE NETHERLANDS*
- A2P-M18 **Z-AXIS CAPACITIVE MEMS ACCELEROMETER WITH MOVING GROUND MASSES**  
C.H. Je, S. Lee, M.L. Lee, J. Lee, W.S. Yang, and C.A. Choi  
*Electronics and Telecommunications Research Institute (ETRI), KOREA, SOUTH*
- A2P-M19 **COIL-LESS FLUXGATE OPERATED IN FEEDBACK MODE BY MEANS OF DC CURRENT**  
M. Butta, M. Janosek, and P. Ripka  
*Czech Technical University in Prague, CZECH REP.*
- A2P-M20 **PHENOMENOLOGICAL THEORY AND EXPERIMENTAL CHARACTERIZATIONS OF PASSIVE WIRELESS EM PRESSURE MICRO-SENSOR PROTOTYPE**  
M.M. Jatlaoui, F. Chebila, T. Idda, P. Pons, and H. Aubert  
*Centre National de la Recherche Scientifique (CNRS), FRANCE*
- A2P-M21 **A CARBON NANOTUBE BASED TEMPERATURE INDEPENDENT STRAIN SENSOR ON A FLEXIBLE POLYMER**  
S. Riekeberg and J. Müller  
*Hamburg University of Technology, GERMANY*

A2P-M22 **A GATE LEVEL SENSOR NETWORK FOR INTEGRATED CIRCUITS TEMPERATURE MONITORING**

A. Vahdatpour, S. Meguerdichian, and M. Potkonjak  
*Univeristy of California, Los Angeles, USA*

**POSTER SESSION T7 - Sensor Networks**

A2P-N1 **DISTRIBUTED NETWORK OF REMOTE SENSORS FOR REAL TIME PREDICTION OF HOT SPOT TEMPERATURE VALUES**

M. Janicki, Z. Kulesza, and A. Napieralski  
*Technical University of Lodz, POLAND*

A2P-N2 **EFFECT OF THE DENSITY OF WIRELESS SENSOR NODE ON ANOMALY DETECTION SPEED FOR AVIAN INFLUENZA MONITORING SYSTEM IN CHICKEN HOUSE**

H. Okada<sup>1</sup>, K. Suzuki<sup>2</sup>, K. Tsukamoto<sup>2</sup>, and T. Itoh<sup>1</sup>  
<sup>1</sup>*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and* |  
<sup>2</sup>*National Institute of Animal Health, JAPAN*

A2P-N3 **SENSOR NETWORK TOPOLOGY ESTIMATION USING TIME-SERIES DATA FROM INFRARED HUMAN PRESENCE SENSORS**

Y. Watanabe<sup>1</sup>, S. Kurihara<sup>2</sup>, and T. Sugawara<sup>1</sup>  
<sup>1</sup>*Waseda University, JAPAN, and* <sup>2</sup>*Osaka University, JAPAN*

A2P-N4 **GRID-SCAN-BASED MULTI-HOP LOCALIZATION ALGORITHM FOR WIRELESS SENSOR NETWORKS**

X.L. Guo, N. Yu, R.J. Feng, Y.F. Wu, and J.W. Wan  
*Beijing University of Aeronautics and Astronautics, CHINA*

A2P-N5 **DESIGN AND PROPERTIES OF A SENSOR NETWORK EMBEDDED IN THIN FIBRE-REINFORCED COMPOSITES**

A. Kunadt<sup>1</sup>, A. Heinig<sup>2</sup>, E. Starke<sup>1</sup>, G. Pfeifer<sup>1</sup>, C. Cherif<sup>1</sup>, and W.-J. Fischer<sup>1</sup>  
<sup>1</sup>*Technische Universität Dresden, GERMANY and* <sup>2</sup>*Fraunhofer IPMS, GERMANY*

A2P-N6 **MULTI-TIER MULTI-HOP ROUTING IN LARGE-SCALE WIRELESS SENSOR NETWORKS FOR REAL-TIME MONITORING**

P. Mahasukhon, H. Sharif, M. Hempel, T. Zhou, T. Ma, and P.L. Shrestha  
*University of Nebraska, Lincoln, USA*

A2P-N7 **FLOATING BEACON-ASSISTED 3-D LOCALIZATION FOR VARIABLE SOUND SPEED IN UNDERWATER SENSOR NETWORKS**

E. Kim, C. Kim, S. Lee, and K. Kim  
*Gwangju Institute of Science and Technology (GIST), KOREA, SOUTH*

A2P-N8 **GAAS MMIC-BASED RF ON-CHIP SPIRAL INDUCTORS WITH METAL SHORES AND PATTERNED GROUND SHIELDS**

Z.Q. Zhang and X.P. Liao  
*Southeast University, CHINA*

A2P-N9 **MOBILE WIRELESS SENSOR NETWORKS APPLIED TO THE SURVEY OF WATER INFRASTRUCTURES**

D. Trincherio<sup>1</sup>, A. Abu-Dayya<sup>2</sup>, L. Cisoni<sup>1</sup>, M. Hasna<sup>3</sup>, A. Kadri<sup>2</sup>, T. Khattab<sup>3</sup>, and R. Stefanelli<sup>1</sup>  
<sup>1</sup>*Politecnico di Torino, ITALY,* <sup>2</sup>*QUWireless Innovations Center, QATAR, and* <sup>3</sup>*Qatar University, QATAR*

A2P-N10 **PRECISION SOFTWARE DEFINED DSSS RADIO FREQUENCY RANGING**

B.D. Farnsworth, and D.W.A Taylor  
*ENSCO, Inc., USA*

## POSTER SESSION T8 - Applications

- A2P-P1     **A COMPENSATED MAGNETIC PROBE FOR STEEL FIBER REINFORCED CONCRETE MONITORING**  
M. Faifer, R. Ottoboni, and S. Toscani  
*Politecnico di Milano, ITALY*
- A2P-P2     **ADAPTIVE REDUCTION OF MOTION ARTIFACT IN A PORTABLE ECG SYSTEM**  
W.C. Lee, T.C. Ke, Y.S. Ou-Yang, C.S. Wei, and C.C. Lee  
*Industrial Technology Research Institute, TAIWAN*
- A2P-P3     **OPTIMAL DESIGN OF OVERLAPPED ULTRASONIC SENSOR RING FOR MINIMAL POSITIONAL UNCERTAINTY**  
S. Kim and H.B. Kim  
*Hankuk University of Foreign Studies, KOREA, SOUTH*
- A2P-P4     **THREE-DIMENSIONAL IMAGING SENSOR SYSTEM USING AN ULTRASONIC ARRAY SENSOR AND A CAMERA**  
H. Furuhashi<sup>1</sup>, Y. Kuzuya<sup>1</sup>, Y. Uchida<sup>1</sup>, and M. Shimizu<sup>2</sup>  
<sup>1</sup>*Aichi Institute of Technology, JAPAN* and <sup>2</sup>*Kansai Electric Power Co. Inc., JAPAN*
- A2P-P5     **PHOTO-INDUCED SWITCHABLE TIO<sub>2</sub> THIN FILMS FOR DECOMPOSITION OF AIR POLLUTANTS AND MICROORGANISMS, SELF-CLEANING SURFACES AND BIOLOGICAL APPLICATION**  
O. Berger, and W. Fischer  
*Technische Universität Dresden, GERMANY*
- A2P-P6     **DATA ACQUISITION AND ANALYSIS TOOL FOR PATIENTS WITH FOOT DROP**  
J. Mogollón and D. Acevedo  
*Pamplona University, COLOMBIA*
- A2P-P7     **POSITION STABILIZATION OF MICROROBOT USING PRESSURE SIGNAL IN PULSATING FLOW OF BLOOD VESSEL**  
J.H. Choi<sup>1</sup>, S.M. Jeong<sup>1</sup>, K.R. Cha<sup>1</sup>, L.L. Qin<sup>1</sup>, J.I.E. Li<sup>1</sup>, B.K. Kim<sup>2</sup>, J.O. Park<sup>1</sup>, and S.H. Park<sup>1</sup>  
<sup>1</sup>*Chonnam National University, KOREA, SOUTH* and <sup>2</sup>*Korea Aerospace University, KOREA, SOUTH*
- A2P-P8     **IMMUNOASSAY DETECTION WITHOUT WASHING BY USING AC MAGNETIC SUSCEPTIBILITY**  
R. Kawabata<sup>1</sup>, T. Mizoguchi<sup>1</sup>, A. Tsukamoto<sup>1</sup>, T. Yoshimura<sup>1</sup>, A. Kandori<sup>1</sup>, and K. Enpuku<sup>2</sup>  
<sup>1</sup>*Hitachi, Ltd., JAPAN* and <sup>2</sup>*Kyushu University, JAPAN*
- A2P-P9     **TEXTILE PRESSURE SENSORS FOR SPORTS APPLICATIONS**  
T. Holleccek, A. Rüegg, H. Harms, and G. Tröster  
*ETH Zurich, SWITZERLAND*
- A2P-P10    **A QOS ENABLED POSITIONING, SENSING, AND COMMUNICATION SYSTEM FOR FIRST RESPONDERS**  
P. Ho, R.P. Liu, M. Hedley, and X. Yang  
*CSIRO, AUSTRALIA*
- A2P-P11    **A SMOOTHER FOR ORIENTATION ESTIMATION USING INERTIAL AND MAGNETIC SENSORS**  
Y.S. Suh, D. Nhut, Y.S. Ro, and H.J. Kang  
*University of Ulsan, KOREA, SOUTH*
- A2P-P12    **FLEXIBLE THERMOELECTRIC GENERATOR FOR WEARABLE BIOMETRIC SENSORS**  
L. Francioso<sup>1</sup>, C. De Pascali<sup>1</sup>, A. Perrone<sup>2</sup>, I. Farella<sup>1</sup>, C. Martucci<sup>1</sup>, P. Creti<sup>1</sup>, and P. Siciliano<sup>1</sup>  
<sup>1</sup>*Consiglio Nazionale delle Ricerche (CNR), ITALY* and <sup>2</sup>*University of Salento, ITALY*

- A2P-P13    **BIOFOULING ON PROTECTIVE COATINGS FOR IMPLANTABLE MEMS**  
I. Clausen, T. Seeberg, C. Gheorghe, and D.T. Wang  
*SINTEF ICT, NORWAY*
- A2P-P14    **SENSING IN HARSH CONDITIONS: HOW TO PROTECT SNO<sub>2</sub> SENSING LAYER**  
R.M. Prasad<sup>1</sup>, R. Riedel<sup>1</sup>, M. Huebner<sup>2</sup>, N. Barsan<sup>2</sup>, and U. Weimar<sup>2</sup>  
<sup>1</sup>*Technische Universität Darmstadt, GERMANY* and <sup>2</sup>*University of Tuebingen, GERMANY*
- A2P-P15    **FEASIBILITY OF WIRELESS GAS DETECTION WITH AN FMCW RADAR INTERROGATION OF PASSIVE RF GAS SENSOR**  
H. Hallil, F. Chebila, P. Menini, P. Pons, and H. Aubert  
*Centre National de la Recherche Scientifique (CNRS), FRANCE*
- A2P-P16    **STUDY OF COFE<sub>2</sub> ALLOY NANO THIN FILMS FOR TEMPERATURE SENSING**  
V. Kumar<sup>1</sup>, R.P. Pant<sup>2</sup>, and M.S. Yadav<sup>3</sup>  
<sup>1</sup>*Deenbandhu Chhotu Ram University of Science and Technology, INDIA*, <sup>2</sup>*National Physical Laboratory, INDIA*, and <sup>3</sup>*Kurukshetra University, INDIA*
- A2P-P17    **VAPOR-PHASE SELF-ASSEMBLED MONOLAYERS FOR IMPROVED MEMS RELIABILITY**  
A. Rissanen<sup>1</sup>, K. Tappura<sup>1</sup>, M. Laamanen<sup>1</sup>, R. Puurunen<sup>1</sup>, E. Färm<sup>2</sup>, M. Ritala<sup>2</sup>, and M. Leskelä<sup>2</sup>  
<sup>1</sup>*VTT Technical Research Centre of Finland, FINLAND* and <sup>2</sup>*University of Helsinki, FINLAND*
- A2P-P18    **APPLICATION OF A PORTABLE ELECTRONIC NOSE DEVICE TO DISCRIMINATE AND IDENTIFY CHEESES WITH KNOWN PERCENTAGES OF COW'S AND GOAT'S MILK**  
Z. Haddi, F. Annanouch, A. Amari, A. Hadoune, N. El Bari, and B. Bouchikhi  
*University of Moulay Ismail, MOROCCO*
- A2P-P19    **A NOVEL SENSOR FUSION CONCEPT FOR DISTANCE MEASUREMENT IN AUTOMOTIVE APPLICATIONS**  
T. Schlegl, T. Bretterkieber, M. Neumayer, and H. Zangl  
*Graz University of Technology, AUSTRIA*
- A2P-P20    **CONTROL LOOPS FOR A COUPLED DARK STATE MAGNETOMETER**  
A. Pollinger<sup>1</sup>, R. Lammegger<sup>2</sup>, W. Magnes<sup>1</sup>, M. Ellmeier<sup>2</sup>, W. Baumjohann<sup>1</sup>, and L. Windholz<sup>2</sup>  
<sup>1</sup>*Austrian Academy of Sciences, AUSTRIA* and <sup>2</sup>*Graz University of Technology, AUSTRIA*
- 11:30 -    **Lunch and Exhibit Inspection**  
12:30

## **SESSION A3L-A Rotation and Vibration Sensing**

- 12:30  
A3L-A1    **AN ELECTROSTATICALLY ACTUATED MICROMACHINED VIBRATING RING GYROSCOPE WITH HIGHLY SYMMETRIC SUPPORT BEAMS**  
D. Chen, M. Zhang, and J. Wang  
*Chinese Academy of Sciences, CHINA*
- 12:45  
A3L-A2    **ULTRA-HIGH Q SILICON GYROSCOPES WITH INTERCHANGEABLE RATE AND FULL ANGLE MODES OF OPERATION**  
A.A. Trusov, I.P. Prikhodko, A.R. Schofield, and A.M. Shkel  
*University of California, Irvine, USA*

- 13:00  
A3L-A3 **MEMS GYROSCOPE CONTROL SYSTEM USING A BAND-PASS CONTINUOUS-TIME SIGMA-DELTA MODULATOR**  
H.T. Ding<sup>1</sup>, R. Wilcock<sup>2</sup>, Z.C. Yang<sup>1</sup>, M. Kraft<sup>2</sup>, and G.Z. Yan<sup>1</sup>  
<sup>1</sup>*Peking University, CHINA* and <sup>2</sup>*University of Southampton, UK*
- 13:15  
A3L-A4 **GAUSSIAN PROCESS BASED STATE ESTIMATION FOR A GYROSCOPE-FREE IMU**  
P. Schopp<sup>1</sup>, A. Rottmann<sup>1</sup>, L. Klingbeil<sup>2</sup>, W. Burgard<sup>1</sup>, and Y. Manoli<sup>1</sup>  
<sup>1</sup>*University of Freiburg, GERMANY* and  
<sup>2</sup>*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*
- 13:30  
A3L-A5 **A NOVEL THREE-AXIS AIM VIBRATION SENSOR FOR HIGH ACCURACY CONDITION MONITORING**  
M. Nowack<sup>1</sup>, D. Reuter<sup>1</sup>, A. Bertz<sup>1</sup>, T. Aurich<sup>2</sup>, and T. Gessner<sup>3</sup>  
<sup>1</sup>*Chemnitz University of Technology, GERMANY*, <sup>2</sup>*GEMAC mbH, GERMANY*, and  
<sup>3</sup>*Fraunhofer Research Institution ENAS, GERMANY*
- 13:45  
A3L-A6 **A HIGH-G ACCELERATION LATCHING SWITCH WITH INTEGRATED NORMALLY-OPEN/CLOSE PATHS INDEPENDENT TO THE PROOF-MASS**  
Z.Y. Guo<sup>1</sup>, B. Zhou<sup>2</sup>, X. Zhang<sup>1</sup>, Q. Zhao<sup>1</sup>, L.T. Lin<sup>1</sup>, Z.C. Yang<sup>1</sup>, and G.Z. Yan<sup>1</sup>  
<sup>1</sup>*Peking University, CHINA* and <sup>2</sup>*Tsinghua University, CHINA*

### **SPECIAL SESSION A3L-B Graphene Based Sensors**

- 12:30 *Invited*  
A3L-B1 **HIGHLY SENSITIVE AND SELECTIVE NO<sub>2</sub> SENSING USING EPITAXIAL GRAPHENE ON 6H-SiC**  
M. Spencer and G. Koley  
*Cornell University, USA and University of South Carolina, USA*
- 13:00  
A3L-B3 **CARBON NANOTUBE AND GRAPHENE BASED GAS MICRO-SENSORS FABRICATED BY DIELECTROPHORESIS ON SILICON**  
S. MacNaughton<sup>1</sup>, S. Surwade<sup>2</sup>, S. Manohar<sup>2</sup>, and S. Sonkusale<sup>1</sup>  
<sup>1</sup>*Tufts University, USA* and <sup>2</sup>*University of Massachusetts, Lowell, USA*
- 13:15  
A3L-B4 **TOWARDS OPTIMISATION OF EPITAXIALLY GROWN GRAPHENE BASED SENSORS FOR HIGHLY SENSITIVE GAS DETECTION**  
R. Pearce, R. Yakimova, T. Iakimov, M. Andersson, A. Lloyd Spetz, L. Hultman  
*Linköping University, SWEDEN*
- 13:30  
A3L-B5 **GRAPHENE FIELD-EFFECT TRANSISTORS FOR LABEL-FREE BIOLOGICAL SENSORS**  
Y. Ohno, K. Maehashi, and K. Matsumoto  
*Osaka University, JAPAN*
- 13:45  
A3L-B6 **FABRICATION OF ULTRASENSITIVE GRAPHENE NANO-BIOSENSORS**  
O.J. Guy, Z. Tehrani, A. Castaing, and S. Doak  
*Swansea University, UK*

## **SESSION A3L-C Electrochemical & pH Sensors**

12:30

**A3L-C1 AN ELECTROCHEMICAL-CANTILEVER HYBRID SENSOR FOR METAL IONS**

L.M. Fischer, A. Nielsen, M. Tenje, and A. Boisen  
*Technical University of Denmark, DENMARK*

12:45

**A3L-C2 DIFFERENTIAL CYCLIC VOLTAMMETRY - A NOVEL TECHNIQUE FOR SELECTIVE AND SIMULTANEOUS DETECTION USING REDOX CYLING BASED SENSORS**

M. Odijk, J. Wiedemair, M. van Megen, W. Olthuis, and A. van den Berg  
*University of Twente, THE NETHERLANDS*

13:00

**A3L-C3 ELECTROCHEMICAL MICROSYSTEM FOR CONTINUOUS MONITORING OF NITRIFICATION ACTIVITY OF MICROBIAL COMPLEXES**

K. Toda, Y. Yawata, E. Setoyama, N. Nomura, J. Fukuda, and H. Suzuki  
*University of Tsukuba, JAPAN*

13:15

**A3L-C4 A WIRELESS PASSIVE PH SENSOR BASED ON PH ELECTRODE POTENTIAL MEASUREMENT**

S. Bhadra, G.E. Bridges, D.J. Thomson, and M.S. Freund  
*University of Manitoba, CANADA*

13:30

**A3L-C5 MULTI-ANALYTE NEEDLE-TYPE SENSOR FOR MEASUREMENT OF PH, PHOSPHATE, AND REDOX POTENTIAL IN SOIL**

W.H. Choi, J.R. Shann, and I. Papautsky  
*University of Cincinnati, USA*

13:45

**A3L-C6 PH SENSOR DEMONSTRATING A LAYOUT PROGRAMMABLE SQUEEZE PUMPED MICROFLUIDIC PLATFORM**

N. Klejwa, J. Provine, and R.T. Howe  
*Stanford University, USA*

## **SESSION A3L-D Wireless Sensor Network Applications**

12:30

**A3L-D1 A NOVEL, WIRELESS SENSOR/ACTUATOR NETWORK FOR THE FACTORY FLOOR**

G. Gaderer and F. Ring, T. Sauter  
*Austrian Academy of Sciences, AUSTRIA*

12:45

**A3L-D2 DISTRIBUTED MULTIPLE HUMAN TRACKING WITH WIRELESS BINARY PYROELECTRIC INFRARED (PIR) SENSOR NETWORKS**

Q. Hao, J. Lu, and F. Hu  
*University of Alabama, USA*

13:00

**A3L-D3 REAL TIME CAR DRIVER'S CONDITION MONITORING SYSTEM**

H.-S. Shin, S.-J. Jung, J.-J. Kim, and W.-Y. Chung  
*Pukyong National University, KOREA, SOUTH*

13:15  
A3L-D4 **A FIELD EXPERIENCE ON DTN-BASED SENSOR DATA GATHERING IN AGRICULTURAL SCENARIOS**  
H. Ochiai, H. Ishizuka, Y. Kawakami, and H. Esaki  
*University of Tokyo, JAPAN*

13:30  
A3L-D5 **DEVELOPMENT ON TELEMETRY SYSTEM FOR DEEP BOREHOLE SENSOR NETWORK**  
M. Kyo, H. Ito, Y. Namba, K. Koseki, and K. Kato  
*Japan Agency for Marine-Earth Science and Technology, JAPAN*

13:45  
A3L-D6 **OPTICAL WIRELESS DATA TRANSMISSION WITH A SENSOR NETWORK INTEGRATED IN A TEXTILE-REINFORCED COMPOSITE**  
A. Heinig<sup>1</sup>, A. Kunadt<sup>2</sup>, and W.-J. Fischer<sup>2</sup>  
<sup>1</sup>*Fraunhofer Institute for Photonic Microsystems, GERMANY* and  
<sup>2</sup>*Dresden University of Technology, GERMANY*

### **SESSION A3L-E Optical Sensing Systems I**

12:30  
A3L-E1 **HIGH TEMPERATURE PHOTONIC CRYSTAL FIBER TIP SENSOR**  
B.S. Park<sup>1</sup>, J. Provine<sup>1</sup>, I. Jung<sup>2</sup>, R.T. Howe<sup>1</sup>, and O. Solgaard<sup>1</sup>  
<sup>1</sup>*Stanford University, USA* and <sup>2</sup>*Argonne National Laboratory, USA*

12:45  
A3L-E2 **PECVD SIC-SIO2-SIC HORIZONTAL SLOT WAVEGUIDES FOR SENSING PHOTONICS DEVICES**  
G. Pandraud, E. Margallo-Balbas, A. Barbosa-Neira, P.M. Sarro  
*Delft University of Technology, THE NETHERLANDS*

13:00  
A3L-E3 **UV DEFINED NANOPOROUS LIQUID CORE WAVEGUIDES**  
M.B. Christiansen, N. Gopalakrishnan, K.S. Sagar, S. Ndoni, and A. Kristensen  
*Technical University of Denmark, DENMARK*

13:15  
A3L-E4 **AN ALL-DIELECTRIC, 3-AXIS ELECTRIC FIELD SENSOR USING QUASI-LONGITUDINALLY CONFIGURED ELECTRO-OPTIC CRYSTALS**  
A. Garzarella and D. Wu  
*Naval Research Laboratory, USA*

13:30  
A3L-E5 **EMBEDDED FLEXIBLE OPTICAL SHEAR SENSOR**  
J. Missinne, E. Bosman, B. Van Hoe, G. Van Steenberge, P. Van Daele, and J. Vanfleteren  
*Ghent University, BELGIUM*

13:45  
A3L-E6 **MODELLING AND EXCITATION OF A THERMO-OPTICAL DELAY LINE FOR OPTICAL COHERENCE TOMOGRAPHY**  
M. Geljon, E. Margallo-Balbás, G. Pandraud, P. French  
*Delft University of Technology, THE NETHERLANDS*

## SESSION A3L-F Sensors for Control of Mobile Platforms

12:30

A3L-F1 **UAV-BASED MULTISPECTRAL ENVIRONMENTAL MONITORING**  
T. Arnold, M. De Biasio, A. Fritz, and R. Leitner  
*CTR Carinthian Tech Research AG, AUSTRIA*

12:45

A3L-F2 **THE 3D-KERNEL DM+V/W ALGORITHM: USING WIND INFORMATION IN THREE DIMENSIONAL GAS DISTRIBUTION MODELLING WITH A MOBILE ROBOT**  
M. Reggente and A.J. Lilienthal  
*Örebro University, SWEDEN*

13:00

A3L-F3 **NAVIGATING A PORTABLE ROBOTIC DEVICE BY A 3D IMAGING SENSOR**  
C. Ye  
*University of Arkansas, USA*

13:15

A3L-F4 **INERTIAL MEASUREMENT SYSTEM FOR BIPED ROBOTS THAT TAKES SCHEDULED CENTRIFUGAL EFFECT INTO CONSIDERATION**  
K. Nishiwaki, and S. Kagami  
*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

13:30

A3L-F5 **AN INTEGRATED SYSTEM FOR PEOPLE FALL-DETECTION WITH DATA FUSION CAPABILITIES BASED ON 3D TOF CAMERA AND WIRELESS ACCELEROMETER**  
M. Grassi<sup>1</sup>, A. Lombardi<sup>1</sup>, G. Rescio<sup>1</sup>, P. Malcovati<sup>1</sup>, A. Leone<sup>2</sup>, G. Diraco<sup>2</sup>, P. Siciliano<sup>2</sup>, M. Malfatti<sup>3</sup>, and L. Gonzo<sup>3</sup>  
*<sup>1</sup>University of Pavia, ITALY, <sup>2</sup>IMM-CNR, ITALY, and <sup>3</sup>Fondazione Bruno Kessler, ITALY*

13:45

A3L-F6 **LOW POWER SENSING ELECTRONICS FOR HIGH-RESOLUTION ERROR-CORRECTING BIOMECHANICAL GROUND REACTION SENSOR CLUSTER**  
M.A. Suster, C. Mastrangelo, and D.J. Young  
*University of Utah, USA*

14:00 -  
14:30

**Break and Exhibit Inspection**

## SESSION A4L-A Resonant and Inertial Sensors

14:30

A4L-A1 **ZERO-BIAS RESONANT SENSOR WITH AN OXIDE-NITRIDE LAYER AS CHARGE TRAP**  
K.K. Park, M. Kupnik, H.J. Lee, O. Oralkan, and B.T. Khuri-Yakub  
*Stanford University, USA*

14:45

A4L-A2 **A LOW TEMPERATURE-DEPENDENCE GAIN-BOOSTING FRONT-END AMPLIFIER FOR CMOS-MEMS GYROSCOPES**  
H. Sun<sup>1</sup>, K. Jia<sup>1</sup>, X. Liu<sup>2</sup>, G. Yan<sup>2</sup>, J. Hsu<sup>3</sup>, and H. Xie<sup>1</sup>  
*<sup>1</sup>University of Florida, USA, <sup>2</sup>Peking University, USA, and <sup>3</sup>Industrial Technology Research Institute, TAIWAN*

15:00

A4L-A3 **A CMOS-MEMS INERTIAL MEASUREMENT UNIT**  
B. Alandry, F. Maily, L. Latorre, and P. Nouet  
*University of Montpellier 2, FRANCE*

15:15  
A4L-A4 **MINIATURE ORIENTATION SENSOR FOR WEARABLE HUMAN MOTION ANALYSIS**  
H.H. Harms<sup>1</sup>, O.A. Amft<sup>2</sup>, R.W. Winkler<sup>1</sup>, J.S. Schumm<sup>1</sup>, and G.T. Troester<sup>1</sup>  
<sup>1</sup>ETH Zurich, SWITZERLAND and <sup>2</sup>Technische Universiteit Eindhoven, THE NETHERLANDS

15:30  
A4L-A5 **CHIP-SCALE IMU USING FOLDED MEMS APPROACH**  
S.A. Zotov, M.C. Rivers, A.A. Trusov, and A.M. Shkel  
University of California, Irvine, USA

15:45  
A4L-A6 **LATE NEWS**

### **SESSION A4L-B Surfaces and Films for Biosensing**

14:30  
A4L-B1 **ROBUST MICROELECTRODES DEVELOPED FOR IMPROVED STABILITY IN ELECTROCHEMICAL CHARACTERIZATION OF BIOMOLECULAR LAYERS**  
Y. Temiz, A. Ferretti, E. Accastelli, Y. Leblebici, and C. Guiducci  
Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

14:45  
A4L-B2 **SENSITIVITY ENHANCEMENT OF LEAKAGE CURRENT MICROSENSOR FOR DETECTION OF TARGET PROTEIN BY USING PROTEIN DENATURANT**  
P. Lorchirachoonkul<sup>1</sup>, T. Shimanouchi<sup>2</sup>, K. Yamashita<sup>1</sup>, H. Umakoshi<sup>2</sup>, R. Kuboi<sup>2</sup>, and M. Noda<sup>1</sup>  
<sup>1</sup>Kyoto Institute of Technology, THAILAND and <sup>2</sup>Osaka University, JAPAN

15:00  
A4L-B3 **SINGLE MOLECULE PROTEIN BIOPHYSICS USING CHEMICALLY MODIFIED NANOPORES**  
K. Freedman<sup>1</sup>, M. Jurgens<sup>2</sup>, S. Peyman<sup>3</sup>, R. Mulero<sup>1</sup>, A. Prabhu<sup>1</sup>, P. Jemth<sup>2</sup>, J. Edel<sup>3</sup>, and M. Kim<sup>1</sup>  
<sup>1</sup>Drexel University, USA, <sup>2</sup>Uppsala University, SWEDEN, and <sup>3</sup>Imperial College, UK

15:15  
A4L-B4 **DIRECT DETECTION OF SALMONELLA TYPHIMURIUM ON TOMATO SURFACE USING MULTIPLE PHAGE-BASED MAGNETOELASTIC BIOSENSORS**  
S.Q. Li, S. Horikawa, S. Shen, A. Simonian, B.A. Chin, and Z.-Y. Cheng  
Auburn University, USA

15:30  
A4L-B5 **ROTATIONAL MODE DISK RESONATORS FOR HIGH-Q OPERATION IN LIQUID**  
A. Rahafrooz and S. Pourkamali  
University of Denver, USA

15:45  
A4L-B6 **INVESTIGATION OF SPONTANEOUSLY ADSORBED GLOBULAR PROTEIN FILMS USING HIGH-FREQUENCY BULK ACOUSTIC WAVE RESONATORS**  
P. Kao, M. Chang, D. Allara, and S. Tadigadapa  
Pennsylvania State University, USA

### **SPECIAL SESSION A4L-C Active Sensing and Chemosensory Optimization**

14:30 *Invited*  
A4L-C1 **BIOMIMETICS AND MATERIALS WITH MULTIPLE PERSONALITIES - THE FOUNDATION OF NEXT GENERATION MOLECULAR SENSING DEVICES?**  
D. Diamond  
Dublin City University, IRELAND

15:00  
A4L-C3 **MULTI-FREQUENCY INTERROGATION OF NANOSTRUCTURED GAS SENSOR ARRAYS**  
R. Calavia<sup>1</sup>, R. Vazquez<sup>1</sup>, A. Vergara<sup>2</sup>, and E. Llobet<sup>1</sup>  
*<sup>1</sup>University Rovira i Virgili, SPAIN and <sup>2</sup>University of California, San Diego, USA*

15:15  
A4L-C4 **AN OVERVIEW OF ACTIVE ODOR SENSING SYSTEM**  
T. Nakamoto  
*Tokyo Institute of Technology, JAPAN*

15:30  
A4L-C5 **ENERGY-AWARE ACTIVE CHEMICAL SENSING**  
R. Gosangi and R. Gutierrez-Osuna  
*Texas A&M University, USA*

15:45  
A4L-C6 **OPTIMIZATION OF SURFACE PLASMON RESONANCE SENSORS FOR ENVIRONMENTAL MONITORING**  
D. Wilson and B. Ferguson  
*University of Washington, USA*

### **SESSION A3L-D Sensor Networks: Remote Sensing and Circuits**

14:30  
A4L-D1 **TRUSTED SENSORS AND REMOTE SENSING**  
M. Potkonjak and S. Meguerdichian  
*University of California, Los Angeles, USA*

14:45  
A4L-D2 **REMOTE EXCITATION AND READOUT OF A HIGH Q SILICON RESONATOR**  
D. Vernooy, A.J. Knobloch, F. Ahmad, and D. Sexton  
*General Electric Global Research, USA*

15:00  
A4L-D3 **REMOTE MONITORING OF THE DEGREE OF POLLUTION OF HIGH VOLTAGE INSULATOR STRINGS VIA SATELLITE WITH A SENSOR SYSTEM NETWORK**  
R.A. de Lima<sup>1</sup>, E. Fontana<sup>1</sup>, J.F. Martins-Filho<sup>1</sup>, T.L. Prata<sup>1</sup>, F.J. Cavalcanti<sup>1</sup>, R.B. Lima<sup>1</sup>, G. Oliveira<sup>1</sup>, and G.O. Cavalcanti<sup>2</sup>  
*<sup>1</sup>Universidade Federal de Pernambuco, BRAZIL and <sup>2</sup>Companhia Hidro Elétrica do São Francisco, BRAZIL*

15:15  
A4L-D4 **FIELD TRIALS ON HYPER MULTI-POINT DATA GATHERING SATCOM SYSTEM WITH HIGHLY EFFICIENT CHANNEL ALLOCATION SCHEME FOR SENSOR NETWORK**  
Y. Imaizumi, Y. Suzuki, K. Nakahira, K. Kobayashi, Y. Taguchi, and N. Tomimizu  
*Nippon Telegraph and Telephone Corporation, JAPAN*

15:30  
A4L-D5 **A LOW-POWER MULTI-STANDARD FRONTEND FOR WIRELESS SENSOR NETWORKS**  
J. Essel<sup>1</sup>, D. Brenk<sup>1</sup>, J. Heidrich<sup>1</sup>, G. Hofer<sup>2</sup>, G. Holweg<sup>2</sup>, and R. Weigel<sup>1</sup>  
*<sup>1</sup>University of Erlangen-Nuremberg, GERMANY, and <sup>2</sup>Infineon Technologies AG, AUSTRIA*

15:45  
A4L-D6 **SENSOR DATA ACQUISITION WITH A 79-FJ/CONVERSION-STEP 7.2-ENOB SUCCESSIVE APPROXIMATION ADC FOR LOW-POWER WIRELESS APPLICATIONS**  
D. Brenk<sup>1</sup>, J. Essel<sup>1</sup>, J. Heidrich<sup>1</sup>, G. Hofer<sup>2</sup>, G. Holweg<sup>2</sup>, and R. Weigel<sup>1</sup>  
*<sup>1</sup>University of Erlangen-Nuremberg, GERMANY and <sup>2</sup>Infineon Technologies AG, AUSTRIA*

## SESSION A4L-E Optical Fiber Sensors

14:30

A4L-E1 **OPTICAL FIBRE HUMIDITY SENSOR DESIGN FOR BUILDING STONE CONDITION MONITORING**

T. Sun<sup>1</sup>, K.T.V. Grattan<sup>1</sup>, S. Srinivasan<sup>2</sup>, P. Basheer<sup>2</sup>, B. Smith<sup>2</sup>, and H. Viles<sup>3</sup>

<sup>1</sup>City University London, UK, <sup>2</sup>Queens University of Belfast, UK, and <sup>3</sup>University of Oxford, UK

14:45

A4L-E2 **REAL-TIME MONITORING OF AGRICULTURAL AMMONIA EMISSIONS BASED ON OPTICAL FIBRE SENSING TECHNOLOGY**

S. O'Keeffe, H. Manap, G. Dooly, and E. Lewis

University of Limerick, IRELAND

15:00

A4L-E3 **A PORTABLE OXYGEN SENSOR BASED ON CMOS DETECTOR**

L. Shen<sup>1</sup>, M. Ratterman<sup>1</sup>, D. Klotzkin<sup>2</sup>, and I. Papautsky<sup>1</sup>

<sup>1</sup>University of Cincinnati, USA and <sup>2</sup>State University of New York, Binghamton, USA

15:15

A4L-E4 **HIGH-SENSITIVITY THERMALLY STABLE ACOUSTIC FIBER SENSOR**

O.C. Akkaya, O. Kilic, M. Dignonnet, G. Kino, and O. Solgaard

Stanford University, USA

15:30

A4L-E5 **WAVELENGTH INTERROGATION OF A TILTED FIBER BRAGG GRATING SENSOR USING SPACE-TO-WAVELENGTH MAPPING OF AN ARRAYED WAVEGUIDE GRATING WITH CLOSED-LOOP PIEZO-ELECTRICAL CONTROL**

H. Guo<sup>1</sup>, G. Xiao<sup>1</sup>, N. Mrad<sup>2</sup>, J. Albert<sup>3</sup>, and J. Yao<sup>4</sup>

<sup>1</sup>National Research Council Canada, CANADA, <sup>2</sup>Defence Research and Development Canada, CANADA, and <sup>3</sup>Carleton University, CANADA, <sup>4</sup>University of Ottawa, CANADA

15:45

A4L-E6 **FIBER BRAGG GRATING CURRENT SENSOR BASED ON A NOVEL SPECTRA BANDWIDTH MEASUREMENT METHOD**

Y. Zhao, T.T. Song, and H. Huang

Northeastern University, CHINA

## SESSION A3L-F Energy and Power

14:30

A4L-F1 **NOVEL VIBRATION-DRIVEN MICRO-ELECTROSTATIC INDUCTION ENERGY HARVESTER WITH ASYMMETRIC MULTI-RESONANT SPRING**

T. Suzuki, S. Nagasawa, H. Okamoto, and H. Kuwano

Tohoku University, JAPAN

14:45

A4L-F2 **CARBON NANOTUBE FILM-BASED CANTILEVER FOR LIGHT AND THERMAL ENERGY HARVESTING**

V. Kotipalli, Z. Gong, Y. He, S. Yadav, S. Penmetsa, and L. Que

Louisiana Technical University, USA

15:00

A4L-F3 **A FRACTAL PHOTODIODE FOR ON-CHIP ENERGY HARVESTING**

D. Leon-Salas, S. Ghosh, and J. Wrobel

University of Missouri, Kansas City, USA

15:15

A4L-F4

**AN ENERGY AUTONOMOUS SWITCHING CONVERTER FOR HARVESTING POWER FROM MULTIPLE PIEZOELECTRIC TRANSDUCERS**

A. Romani<sup>1</sup>, R.P. Paganelli<sup>2</sup>, M. Tartagni<sup>1</sup>, and E. Sangiorgi<sup>1</sup>

<sup>1</sup>*University of Bologna, ITALY* and <sup>2</sup>*Consiglio Nazionale delle Ricerche (CNR), ITALY*

15:30

A4L-F5

**A NEW MEMS SENSOR FOR AC ELECTRIC CURRENT**

E.S. Leland, C.T. Sherman, P. Minor, P.K. Wright, and R.M. White

*University of California, Berkeley, USA*

15:45

A4L-F6

**DESIGN OF A SOI MEMS RESONANT ELECTRIC FIELD SENSOR FOR POWER ENGINEERING APPLICATIONS**

C.R. Peng, P.F. Yang, H.Y. Zhang, X.I.N. Guo, and S.H. Xia

*Chinese Academy of Sciences, CHINA*

16:00 -

17:30

**SENSORS Networking Activities**

## Wednesday, November 3, 2010

### 08:00 KEYNOTE PRESENTATION 2

#### B1K-A1 THE PERSPECTIVE OF BIOMEDICAL ELECTRONICS

C.-Y. Wu  
*National Chiao Tung University, TAIWAN*

### SESSION B1L-A Accelerometers

08:45

#### B1L-A1 A NOVEL SOI-BASED SINGLE PROOF-MASS 3-AXIS ACCELEROMETER WITH GAP-CLOSING DIFFERENTIAL CAPACITIVE ELECTRODES IN ALL SENSING DIRECTIONS

W. Fang, C.P. Hsu, Y.-C. Hsu, and M.-C. Yip  
*National Tsing Hua University, TAIWAN*

09:00

#### B1L-A2 HIGHLY SENSITIVE TUNNELING ACCELEROMETER FOR LOW ACTUATION VOLTAGE OPERATION

M.S. Patra and D.R. Bhattacharyya  
*Indian Institute of Technology, Kharagpur, INDIA*

09:15

#### B1L-A3 A MONOLITHIC INERTIAL MEASUREMENT UNIT FABRICATED WITH IMPROVED DRIE POST-CMOS PROCESS

H. Sun<sup>1</sup>, K. Jia<sup>1</sup>, Z. Guo<sup>2</sup>, X. Liu<sup>2</sup>, G. Yan<sup>2</sup>, and H. Xie<sup>1</sup>  
<sup>1</sup>University of Florida, USA and <sup>2</sup>Peking University, CHINA

09:30

#### B1L-A4 ARRAYS OF SILICON CANTILEVERS FOR DETECTING HIGH-G RAPIDLY VARYING ACCELERATION PROFILES

N. Raghunathan, E. Nishida, A. Fruehling, W. Chen, and D. Peroulis  
*Purdue University, USA*

09:45

#### B1L-A5 NEMS ACCELEROMETERS WITH NANOSCALE SENSING ELEMENTS

R. Amarasinghe, D.V. Dzung, and S. Sugiyama  
*Ritsumeikan University, JAPAN*

10:00

#### B1L-A6 MEMS ACCELEROMETERS ON POLYIMIDES FOR FAILURE ASSESSMENT IN AEROSPACE SYSTEMS

I.E. Gonenli, Z. Celik-Butler, and D.P. Butler  
*University of Texas, Arlington, USA*

### SESSION B1L-B Sensing in Blood

08:45

#### B1L-B1 THEORETICAL BASE OF ALCOHOLIC-INTAKE DETECTION USING BLOOD-PULSE SIGNALS AND NEW FINDINGS

M.R. Shimizu, and P. Omura  
*Kansai University, JAPAN*

09:00

B1L-B2

**LAB-ON-A-CHIP SENSOR FOR MEASURING ZINC IN BLOOD SERUM**

P. Jothimuthu, R. Wilson, J. Herren, H. Wong, W. Heineman, and I. Papautsky  
*University of Cincinnati, USA*

09:15

B1L-B3

**IMPLANTABLE SENSOR FOR BLOOD PRESSURE DETERMINATION VIA PULSE TRANSIT TIME**

J. Fiala<sup>1</sup>, P. Bingger<sup>1</sup>, K. Foerster<sup>2</sup>, C. Heilmann<sup>2</sup>, F. Beyersdorf<sup>2</sup>, H. Zappe<sup>1</sup>, and A. Seifert<sup>1</sup>  
<sup>1</sup>*University of Freiburg - IMTEK, GERMANY* and <sup>2</sup>*University Medical Center Freiburg, GERMANY*

09:30

B1L-B4

**DIRECT PHOTO-THERMAL DIAGNOSIS OF ANEMIA USING PLATINUM RESISTANCE TEMPERATURE DETECTOR**

B.S. Kwak, H.J. Kim, H.O. Kim, and H.I. Jung  
*Yonsei University, KOREA, SOUTH*

09:45

B1L-B5

**MONITORING OF PERI-CELLULAR OXYGEN LEVELS IN TUMOR CELL CULTURES BY AMPEROMETRIC OXYGEN SENSOR ARRAY**

J. Kieninger<sup>1</sup>, J.A. Sandvik<sup>2</sup>, E.O. Pettersen<sup>2</sup>, G. Jobst<sup>3</sup>, K. Aravindalochanan<sup>1</sup>, G.A. Urban<sup>1</sup>  
<sup>1</sup>*University of Freiburg - IMTEK, GERMANY*, <sup>2</sup>*University of Oslo, NORWAY*,  
<sup>3</sup>*Jobst Technologies GmbH, GERMANY*

10:00

B1L-B6

**Late News**

**SESSION B1L-C Chemiresistive Sensors**

08:45

B1L-C1

**THE JPL ELECTRONIC NOSE: MONITORING AIR IN THE US LAB ON THE INTERNATIONAL SPACE STATION**

M.A. Ryan, K.S. Manatt, S. Gluck, A.V. Shevade, A.K. Kisor, H. Zhou, L.M. Lara, and M.L. Homer  
*Jet Propulsion Laboratory, USA*

09:00

B1L-C2

**AEROSOL SYNTHESIS OF CHEMORESISTIVE GAS SENSORS: MATERIALS, STRUCTURES AND PERFORMANCES**

A. Tricoli, M. Righettoni, and S. Pratsinis  
*ETH Zurich, SWITZERLAND*

09:15

B1L-C3

**DEVELOPMENT OF A MINIATURIZED NO<sub>2</sub> GAS SENSOR BASED ON NANOPARTICLES WO<sub>3</sub> THINFILM ON SUB-MICRON GAP INTERDIGITATED ELECTRODES**

D. Dao  
*Ritsumeikan University, JAPAN*

09:30

B1L-C4

**PERFORMANCE OF INDUCTIVELY COUPLED OXYGEN SENSORS**

W. Wu, D.W. Greve, and I.J. Oppenheim  
*Carnegie Mellon University, USA*

- 09:45  
B1L-C5 **A MEMS-BASED APPROACH THAT USES TEMPERATURE-DEPENDENT SENSING RESPONSES TO RECOGNIZE CHEMICAL TARGETS IN UNTRAINED BACKGROUNDS**  
B. Raman<sup>1</sup>, R. Shenoy<sup>2</sup>, D.C. Meier<sup>2</sup>, K.D. Benkstein<sup>2</sup>, and S. Semancik<sup>2</sup>  
*<sup>1</sup>Washington University, St. Louis, USA and <sup>2</sup>National Institute of Standards and Technology, USA*
- 10:00  
B1L-C6 **INCREASING THE SELECTIVITY OF PT-GATE SIC FIELD EFFECT GAS SENSORS BY DYNAMIC TEMPERATURE MODULATION**  
C. Bur<sup>1</sup>, M. Andersson<sup>2</sup>, P. Reimann<sup>1</sup>, A. Schuetze<sup>1</sup>, and A. Lloyd Spetz<sup>2</sup>  
*<sup>1</sup>Saarland University, GERMANY, <sup>2</sup>Linköping University, SWEDEN*

### **SPECIAL SESSION B1L-D Green RFID and RFID-Enabled Wireless Sensors**

- 08:45 *Invited*  
B1L-D1 **INKJET-PRINTED PAPER/POLYMER-BASED GREEN RFID AND WIRELESS SENSOR NODES: THE FINAL STEP TO BRIDGE COGNITIVE INTELLIGENCE, NANOTECHNOLOGY AND RF**  
M. Tentzeris, A. Traille, H. Lee, V. Lakafosis, and R. Vyas  
*Georgia Institute of Technology, USA*
- 09:15  
B1L-D3 **CHIPLESS RFID TAG WITH INTEGRATED SENSOR**  
D.R. Preradovic, and D.R. Karmakar  
*Monash University, AUSTRALIA*
- 09:30  
B1L-D4 **A PROTOTYPE IMPLEMENTATION OF AMBIENT RF ENERGY HARVESTING WIRELESS SENSOR NETWORKS**  
H. Nishimito, Y. Kawahara, and T. Asami  
*University of Tokyo, JAPAN*
- 09:45  
B1L-D5 **EXPERIMENTAL INVESTIGATION OF DISTRIBUTED DETECTION USING A SENSOR NETWORK BASED ON COUPLED OSCILLATOR ARRAYS**  
A. Collado and A. Georgiadis  
*Centre Tecnologic de Telecomunicacions de Catalunya, SPAIN*
- 10:00  
B1L-D6 **ULTRA-LOW-POWER RFID-BASED SENSOR MOTE**  
N. Gay and W.-J. Fischer  
*Fraunhofer Institute for Photonic Microsystems, GERMANY*

### **SESSION B1L-E Multi-Spectral Systems**

- 08:45  
B1L-E1 **DEVELOPMENT OF SENSING SYSTEM FOR CARBONACEOUS PARTICLES USING LIBS COMBINED WITH LII TEMPORAL ANALYTICAL TECHNIQUE**  
S. Ikezawa, M. Wakamatsu, Y. Zimin, and T. Ueda  
*Waseda University, JAPAN*
- 09:00  
B1L-E2 **MICRO-ENGINEERED CONTRAST AGENTS FOR MULTI-SPECTRAL MAGNETIC RESONANCE IMAGING**  
X. Wang<sup>1</sup>, S. Anderson<sup>2</sup>, and X. Zhang<sup>1</sup>  
*<sup>1</sup>Boston University, USA and <sup>2</sup>Boston Medical Center, USA*

- 09:15  
B1L-E3 **SPECTRO-TOMOGRAPHY INTERPRETATION FOR INTEGRATED SENSING OF PROCESS COMPONENT IDENTIFICATION AND DISTRIBUTION**  
M. Nahvi and B.S. Hoyle  
*University of Guilan, IRAN, University of Leeds, UK*
- 09:30  
B1L-E4 **POSITIVE SIZE-EFFECT ON THE SENSITIVITY OF A PLANAR COUNTER-CURRENT MICRO FLAME IONIZATION DETECTOR**  
W.J. Kuipers and J. Müller  
*Hamburg University of Technology, GERMANY*
- 09:45  
B1L-E5 **SOFT SENSOR FOR THE CHARACTERIZATION OF FIBROUS MATERIALS THROUGH MULTIVARIATE AND MULTIREOLUTION IMAGE ANALYSIS**  
E. Tomba, F. Bezzo, M. Barolo, and P. Facco  
*Università di Padova, ITALY*
- 10:00  
B1L-E6 **2D IMAGE RECONSTRUCTION FROM BLURRED AND DISTURBED MULTI PARAMETER MEASUREMENTS AT THE EXAMPLE OF AN INDUCTIVE METAL DETECTOR**  
H. Krüger and H. Ewald  
*University of Rostock, GERMANY*
- 10:15 -  
12:15 **POSTER SESSION B2P-2**

### **POSTER SESSION W1 - Phenomena, Modeling & Evaluation**

- B2P-G1 **OPTIMIZATION OF AN EXTRAORDINARY MAGNETORESISTANCE SENSOR IN THE SEMICONDUCTOR-METAL HYBRID STRUCTURE**  
J. Sun<sup>1</sup>, J. Kosel<sup>1</sup>, C. Gooneratne<sup>1</sup>, and Y. Soh<sup>2</sup>  
*<sup>1</sup>King Abdullah University of Science and Technology, SAUDI ARABIA and <sup>2</sup>Imperial College London, UK*
- B2P-G2 **RESTORATION OF RADIALY BLURRED IMAGE CREATED BY SPHERICAL SINGLE LENS SYSTEM OF CELLULAR PHONE CAMERA**  
Y. Zhang, I. Minema, and T. Ueda  
*Waseda University, JAPAN*
- B2P-G3 **FORMATION AND CHARACTERIZATIONS OF POROUS 3C-SIC THIN FILMS FOR MICRO/NANO SYSTEMS**  
B. Lee and G. Chung  
*University of Ulsan, KOREA, SOUTH*
- B2P-G4 **EFFECT OF SUBSTRATE ON RELIABILITY AND ANTENNA INDICATOR PARAMETERS OF CU BASED PATCH ANTENNA**  
D. Feili, N. Pagel, V.L. Ngo, and H. Seidel  
*Saarland University, GERMANY*
- B2P-G5 **PROPOSAL OF 3 DIMENSION IMAGINARY SPACE TOUCH PANEL USING ULTRASONIC SENSORS**  
R. Yasunaka<sup>1</sup>, Y. Kitazono<sup>1</sup>, S. Nakashima<sup>2</sup>, L. Zhang<sup>1</sup>, and S. Serikawa<sup>1</sup>  
*<sup>1</sup>Kyushu Institute of Technology, JAPAN and <sup>2</sup>Ube National College of Technology, JAPAN*

- B2P-G6     **ELASTICITY OF SI CALCULATED WITH A LATTICE DYNAMICS MODEL**  
W. Zhang, Q.A. Huang, and H. Yu  
*Southeast University, CHINA*
- B2P-G7     **CHARACTERIZATION OF METAL ELECTRODE-SENSING LAYER INTERFACE IN SENSORS UNDER OPERATION**  
A. Gurlo<sup>1</sup>, J. Grattage<sup>2</sup>, and R. Riedel<sup>1</sup>  
*<sup>1</sup>Technische Universität Darmstadt, GERMANY, <sup>2</sup>ESRF, FRANCE*
- B2P-G8     **A TILING-BASED APPROACH FOR DIRECTIONAL SENSOR NETWORK DEPLOYMENT**  
C.-H. Wu<sup>1</sup> and Y.-C. Chung<sup>2</sup>  
*<sup>1</sup>Industrial Technology Research Institute, TAIWAN and <sup>2</sup>National Tsing Hua University, TAIWAN*
- B2P-G9     **INTEGRATED HYDROPHOBIC AND HYDROPHILIC SUBSTRATE BY NANOPATTERNED SURFACES**  
H.J. Jin, A. Hsiao, and L. Liu  
*University of Illinois, Urbana-Champaign, USA*
- B2P-G10    **SEPARATING RESPIRATION ARTIFACT IN MICROWAVE DOPPLER RADAR HEART MONITORING BY INDEPENDENT COMPONENT ANALYSIS**  
M. Zakrzewski and J. Vanhala  
*Tampere University of Technology, FINLAND*
- B2P-G11    **SENSING OF PULSED RADIATION WITH PYROELECTRIC DETECTORS**  
S. Efthymiou and K.B. Ozanyan  
*University of Manchester, UK*
- B2P-G12    **MONITORING AND VISUALIZATION OF LARGE WSN DEPLOYMENTS**  
R. Elhakim, and M. Elhelw  
*Nile University, EGYPT*
- B2P-G13    **THERMAL SENSOR VARIATION REDUCTION IN DEEP SUB 100NM PROCESS TECHNOLOGIES**  
D. Duarte, M. Abdelmoneum, and G. Taylor  
*Intel Corporation, USA*
- B2P-G14    **A NEW OXYGEN SATURATION IMAGES OF IRIS TISSUE**  
C.C. Hung, S.J. Chen, and C.H. Shen  
*National Changhua University of Education, TAIWAN*
- B2P-G15    **HIGH PERFORMANCE ATOMIC FORCE MICROSCOPE BASED ON AIR-SPACED PIEZORESISTIVE CANTILEVERS**  
Y. Hu, Q. Zheng, and Y. Xu  
*Wayne State University, USA*
- B2P-G16    **ELECTROMECHANICAL SENSING OF CHARGE RETENTION IN FLOATING ELECTRODES**  
D. Elata<sup>1</sup>, V. Leus<sup>1</sup>, J. Provine<sup>2</sup>, A. Hirshberg<sup>1</sup>, and R.T. Howe<sup>2</sup>  
*<sup>1</sup>Technion - Israel Institute of Technology, ISRAEL and <sup>2</sup>Stanford University, USA*
- B2P-G17    **AN ANALYTICAL MODEL OF A THERMALLY EXCITED MICROCANTILEVER VIBRATING LATERALLY IN A VISCOUS FLUID**  
S.M. Heinrich<sup>1</sup>, R. Maharjan<sup>1</sup>, I. Dufour<sup>2</sup>, F. Josse<sup>1</sup>, L.A. Beardslee<sup>3</sup>, and O. Brand<sup>3</sup>  
*<sup>1</sup>Marquette University, USA, <sup>2</sup>Université de Bordeaux, FRANCE, and <sup>3</sup>Georgia Institute of Technology, USA*
- B2P-G18    **MODELING APPROACH FOR FULL-SYSTEM DESIGN AND RAPID HARDWARE PROTOTYPING OF MICROELECTROMECHANICAL SYSTEMS**  
R. Khalilyulin, T. Steinhuber, T. Reutter, G. Wachutka, and G. Schrag  
*Munich University of Technology, GERMANY*

## POSTER SESSION W2 - Sensor/Actuator Systems

- B2P-H1 **AN OPTICAL ABSORBANCE-BASED MULTI-ANALYTES BIODETECTOR USING A TRI-CHROMATIC LED, PDS AND OPTICAL FIBERS AND ITS APPLICATION TO A PALM-SIZED URIN**  
D.S. Lee<sup>1</sup>, B.K. Jeon<sup>2</sup>, M.J. Sohn<sup>3</sup>, and M.Y. Jung<sup>1</sup>  
<sup>1</sup>Electronics and Telecommunications Research Institute (ETRI), KOREA, SOUTH, <sup>2</sup>Optosta Co., KOREA, SOUTH, and <sup>3</sup>Korea Research Institute of Bioscience and Biotechnology, KOREA, SOUTH
- B2P-H2 **A NOVEL MINIATURE WIND GENERATOR FOR WIRELESS SENSING APPLICATIONS**  
D. Zhu, S.P. Beeby, M.J. Tudor, and N.R. Harris  
*University of Southampton, UK*
- B2P-H3 **CELL MANIPULATION SYSTEM BASED ON A SILICON MICRO FORCE SENSOR WITH SELF-CALIBRATION FROM BACKSIDE**  
T. Beutel, N. Ferreira, A. Balck, M. Leester-Schädel, and S. Büttgenbach  
*Technische Universität Braunschweig, GERMANY*
- B2P-H4 **1 VOLT, 1 GHZ NEMS SWITCHES**  
M. Tabib-Azar<sup>1</sup>, K. Yang<sup>2</sup>, K. Yang<sup>2</sup>, R. Venumbaka<sup>1</sup>, K. Alzoubi<sup>2</sup>, and D. Saab<sup>2</sup>  
<sup>1</sup>University of Utah, USA and <sup>2</sup>Case Western Reserve University, USA
- B2P-H5 **AN ULTRA LOW-POWER SINGLE CHIP INTELLIGENT SENSING PLATFORM**  
N. Schemm, S. Balkir, and M.W. Hoffman  
*University of Nebraska, Lincoln, USA*
- B2P-H6 **A CAPACITANCE-TO-FREQUENCY CONVERTERS COMPARISON FOR A FREQUENCY ACQUISITION PLATFORM**  
R. Aragonés Ortiz, P. Álvarez Rengifo, J. Oliver i Malagelada, and C. Ferrer i Ramis  
*Universitat Autònoma de Barcelona, SPAIN*
- B2P-H7 **A WIDE DYNAMIC RANGE SELF-BIASED FULLY DIFFERENTIAL OPERATIONAL AMPLIFIER FOR MICRO MECHANICAL SENSORS AND ACTUATORS CIRCUITRY**  
M. Abdelmoneum, D. Duarte, and G. Taylor  
*Intel Corporation, USA*
- B2P-H8 **A RELATIVE-STORY DISPLACEMENT SENSOR RESOLVING THE ANGULAR ERROR PROBLEM**  
I. Matsuya<sup>1</sup>, R. Katamura<sup>2</sup>, M. Sato<sup>1</sup>, H. Kondo<sup>1</sup>, M. Iba<sup>1</sup>, K. Kanekawa<sup>1</sup>, T. Tanii<sup>1</sup>, A. Nishitani<sup>1</sup>, and I. Ohdomari<sup>1</sup>  
<sup>1</sup>Waseda University, JAPAN, and <sup>2</sup>Kajima Corporation, JAPAN
- B2P-H9 **SMART ANALOG COMPENSATION OF SPURIOUS SIGNALS FOR A FULLY DIFFERENTIAL INTERFACE FOR RESONATING SENSORS**  
A.O. Niedermayer, T. Voglhuber-Brunnmaier, and B. Jakoby  
*Johannes Kepler University, AUSTRIA*
- B2P-H10 **SEMANTIC MULTIMODAL COMPRESSION FOR WEARABLE SENSING SYSTEMS**  
S. Meguerdichian, H. Noshadi, F. Dabiri, and M. Potkonjak  
*University of California, Los Angeles, USA*
- B2P-H11 **DISPLACEMENT AMPLIFICATION AND LATCHING MECHANISM USING V-SHAPE ACTUATORS IN DESIGN OF ELECTRO-THERMAL MEMS SWITCHES**  
J.J. Khazaai<sup>1</sup>, M. Haris<sup>1</sup>, H. Qu<sup>1</sup>, and J. Slicker<sup>2</sup>  
<sup>1</sup>Oakland University, USA and <sup>2</sup>MicroStar Technologies, LLC, USA

- B2P-H12 **A SYSTEM OF PARALLEL AND SELECTIVE MICROCHANNELS FOR BIOSENSOR SAMPLE DELIVERY AND CONTAINMENT**  
T.L. Edwards  
*Sandia National Laboratories, USA*
- B2P-H13 **A MICROMACHINED 2-DOF NANOPositionER WITH INTEGRATED CAPACITIVE DISPLACEMENT SENSOR**  
L. Ji, Y. Zhu, R. Moheimani, and M. Yuce  
*University of Newcastle, AUSTRALIA*
- B2P-H14 **HAIRCELL-INSPIRED CAPACITIVE ACCELEROMETER WITH BOTH HIGH SENSITIVITY AND BROAD DYNAMIC RANGE**  
Q. Zheng<sup>1</sup>, Y. Zhang<sup>2</sup>, Y. Lei<sup>3</sup>, J. Song<sup>4</sup>, and Y. Xu<sup>1</sup>  
<sup>1</sup>Wayne State University, USA, <sup>2</sup>University of Maryland, USA, <sup>3</sup>Xiamen University, CHINA, and <sup>4</sup>Shanghai Ocean University, CHINA
- B2P-H15 **A LOW LOSS SINGLE-POLE TWELVE-THROW RADIO FREQUENCY MICROELECTROMECHANICAL SYSTEMS SWITCH**  
S. Kang<sup>1</sup>, Y. Jang<sup>1</sup>, H.C. Kim<sup>2</sup>, and K. Chun<sup>1</sup>  
<sup>1</sup>Seoul National University, KOREA, SOUTH and <sup>2</sup>Ulsan University, KOREA, SOUTH
- B2P-H16 **HIGH RESOLUTION MICRO-PIRANI PRESSURE SENSOR GAUGE WITH TRANSIENT RESPONSE PROCESSING**  
O. Legendre<sup>1</sup>, H. Mathias<sup>1</sup>, J. Juillard<sup>2</sup>, E. Martincic<sup>1</sup>, and F. Maily<sup>3</sup>  
<sup>1</sup>Université Paris Sud XI, FRANCE, <sup>2</sup>SUPÉLEC, FRANCE, and <sup>3</sup>Université Montpellier, FRANCE

### POSTER SESSION W3 - Chemical & Gas Sensors

- B2P-J1 **MACH-ZEHNDER INTERFEROMETRIC HYDROGEN SENSOR BASED A SINGLE MODE FIBER HAVING CORE STRUCTURE MODIFICATION AT TWO SECTIONS**  
Y.H. Kim<sup>1</sup>, M.J. Kim<sup>2</sup>, B.S. Rho<sup>2</sup>, K.H. Kwack<sup>3</sup>, and B.H. Lee<sup>1</sup>  
<sup>1</sup>Gwangju Institute of Science and Technology (GIST), KOREA, SOUTH, <sup>2</sup>Korea Photonics Technology Institute, KOREA, and SOUTH, <sup>3</sup>Optowon, KOREA, SOUTH
- B2P-J2 **LOW COST, CALIBRATION-FREE SENSORS FOR IN SITU DETERMINATION OF NATURAL WATER POLLUTION**  
A. Radu<sup>1</sup>, S. Anastasova<sup>1</sup>, C. Fay<sup>1</sup>, C. Slater<sup>1</sup>, J. Bobacka<sup>2</sup>, A. Lewenstam<sup>2</sup>, and D. Diamond<sup>1</sup>  
<sup>1</sup>Dublin City University, IRELAND and <sup>2</sup>Abo Academi, FINLAND
- B2P-J3 **SI: WO3 SENSORS FOR NONINVASIVE DIABETES DIAGNOSIS BY BREATH ANALYSIS**  
M. Righettoni, A. Tricoli, and S. Pratsinis  
*ETH Zurich, SWITZERLAND*
- B2P-J4 **A NOVEL MICRO PARAMAGNETIC OXYGEN SENSOR BASED ON AN AMR-SENSOR**  
F. König and J. Müller  
*Hamburg University of Technology, GERMANY*
- B2P-J5 **SNO2/NIO COMPOSITE THIN FILMS FOR FORMALDEHYDE DETECTION**  
J.L. Dunford, J.J. Tunney, and X. Du  
*National Research Council Canada, CANADA*
- B2P-J6 **POLYMER-BASED CARBON MONOXIDE SENSORS**  
M.L. Homer, A.V. Shevade, H. Zhou, A.K. Kisor, L.M. Lara, M.A. Ryan, S.S. Yen, M.S. Anderson  
*Jet Propulsion Laboratory and California Institute of Technology, USA*

- B2P-J7      **MODELING OF GAS SENSITIVITY FOR P-TYPE SEMICONDUCTING THIN FILMS**  
R. Jaaniso, I Karkkanen, and A. Floren  
*University of Tartu, ESTONIA*
- B2P-J8      **NITROPHENOL DETECTION USING SUSPENDED SWNT FILMS FOR ENVIRONMENTAL MONITORING**  
T. An, I.T. Kim, and G. Lim  
*Pohang University of Science and Technology (POSTECH), KOREA, SOUTH*
- B2P-J9      **ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY SENSING OF TOXIC ORGANOPHOSPHORUS COMPOUNDS**  
B.B. Narakathu, S.O. Obare, and M.Z. Atashbar  
*Western Michigan University, USA*
- B2P-J10     **ACTIVE STEREO NOSE: USING AIR CURTAIN TO ENHANCE THE DIRECTIVITY**  
I. Miyatani, and H. Ishida  
*Tokyo University of Agriculture and Technology, JAPAN*
- B2P-J11     **SELF-PATTERNED GOLD ELECTROPLATED MULTICAPILLARY SEPARATION COLUMNS**  
H. Zareie, B. Alfeeli, A. Zareian Jahromi, and M. Agah  
*Virginia Polytechnic Institute and State University, USA*
- B2P-J12     **MICROFABRICATED DIFFERENTIAL-MODE GAS SENSOR UTILIZING TEMPERATURE COMPENSATION**  
R.C. Roberts and N.C. Tien  
*Case Western Reserve University, USA*
- B2P-J13     **GRAPHENE-BASED ULTRA-SENSITIVE GAS SENSORS**  
I.F. Rivera, R.K. Joshi, and J. Wang  
*University of South Florida, USA*
- B2P-J14     **MEMS RESONANT SENSORS FOR DETECTION OF GASOLINE VAPOR**  
A. Hajjam, J. Pandiyan, A. Rahafrooz, and S. Pourkamali  
*University of Denver, USA*
- B2P-J15     **ETHANOL SENSING PERFORMANCE OF OPTICAL FIBERS COATED WITH NANOSTRUCTURED PT/WO3 FILMS**  
M.Z. Ahmad, J.Z. Ou, M.H. Yaacob, K. Kalantar-zadeh, and W. Wlodarski  
*Royal Melbourne Institute of Technology (RMIT), AUSTRALIA*
- B2P-J16     **INTEGRATED SENSOR HEAD FOR GAS ANALYSIS VIA ATOMIC EMISSION SPECTROSCOPY**  
M. Gruber, M. Bohling, M. Mogl, H. Knuppertz, and H. Winkelmann  
*University of Hagen, GERMANY*
- B2P-J17     **ACETONE SENSOR BASED ON FILM BULK ACOUSTIC RESONATOR**  
X. Qiu, R. Tang, J. Zhu, J. Oiler, Z. Wang, and H. Yu  
*Arizona State University, USA*

#### **POSTER SESSION W4 - Biosensors**

- B2P-K1      **INTEGRATION OF VERTICAL GRATING COUPLERS AND MICROFLUIDIC CHANNELS WITH SILICON PHOTONIC WIRE BIOSENSOR ARRAYS**  
A. Densmore<sup>1</sup>, D.-X. Xu<sup>1</sup>, P. Cheben<sup>1</sup>, M. Vachon<sup>1</sup>, S. Janz<sup>1</sup>, R. Ma<sup>1</sup>, R. Halir<sup>2</sup>, I. Molina-Fernandez<sup>2</sup>, and Y. Li<sup>1</sup>  
<sup>1</sup>National Research Council Canada, CANADA and <sup>2</sup>Universidad de Malaga, SPAIN

- B2P-K2     **SENSITIVITY INVESTIGATIONS OF SURFACE STRESS CAPACITIVE DNA**  
S. Chatzandroulis<sup>1</sup>, V. Tsouti<sup>1</sup>, M. Ioannou<sup>2</sup>, I. Zergioti<sup>3</sup>, D. Goustouridis<sup>1</sup>, J. Hue<sup>4</sup>, R. Rousier<sup>4</sup>, D. Tsoukalas<sup>3</sup>,  
and P. Normand<sup>1</sup>  
<sup>1</sup>NCSR Demokritos, GREECE, <sup>2</sup>FORTH, Institute of Molecular Biology and Biotechnology, GREECE,  
<sup>3</sup>National Technical University of Athens, GREECE, and <sup>4</sup>CEA - LETI, FRANCE
- B2P-K3     **A PORTABLE IMPEDANCE BIOSENSOR INSTRUMENT FOR RAPID DETECTION OF AVIAN  
INFLUENZA VIRUS**  
J.H. Lin<sup>1</sup>, J. Lum<sup>1</sup>, R.H. Wang<sup>1</sup>, S. Tung<sup>1</sup>, H.G. Lu<sup>2</sup>, and Y.B. Li<sup>1</sup>  
<sup>1</sup>University of Arkansas, USA and <sup>2</sup>Pennsylvania State University, USA
- B2P-K4     **WHOLE FIELD LIVING CELL MAPPING USING DIFFRACTION MOIRÉ SENSOR**  
X. Zheng and X. Zhang  
Boston University, USA
- B2P-K5     **AMPEROMETRIC BIOSENSOR: INCREASED SENSITIVITY USING ENZYME NANOPARTICLES**  
S. Sharma, A. Shrivastava, N. Gupta, and S. Srivastava  
Jaypee Institute of Information Technology, INDIA
- B2P-K6     **A BACTERIAL BIOFILM SURFACE ACOUSTIC WAVE (SAW) SENSOR FOR REAL TIME  
BACTERIAL GROWTH MONITORING**  
Y.W. Kim, S.E. Sardari, A.A. Iliadis, and R. Ghodssi  
University of Maryland, USA
- B2P-K7     **A NOVEL MULTI-WORKING ELECTRODES POTENTIOSTAT FOR ELECTROCHEMICAL  
DETECTION OF METABOLITES**  
D. De Venuto<sup>1</sup>, M.D. Torre<sup>1,2</sup>, C. Boero<sup>2</sup>, S. Carrara<sup>2</sup>, and G. De Micheli<sup>2</sup>  
<sup>1</sup>Politecnico di Bari, ITALY and <sup>2</sup>Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- B2P-K8     **HIGH SENSITIVE CIRCULAR HALL EFFECT SENSOR FOR MAGNETIC BEAD LABELED  
IMMUNOASSAY**  
B. Zhang, C.A.N. Korman, and M. Zaghloul  
George Washington University, USA
- B2P-K9     **MICROPOST ARRAY FOR FORCE MAPPING OF VASCULAR SMOOTH MUSCLE CELLS**  
Q. Cheng, Z. Sun, G. Meininger, and M. Almasri  
University of Missouri, Columbia, USA
- B2P-K10    **TUNING OF LUMINESCENT SENSOR RESPONSE AND DEGRADATION THROUGH  
MANIPULATION OF NANOFILM COATING PROPERTIES**  
B. Collier, J. Park, and M. McShane  
Texas A&M University, USA
- B2P-K11    **A NEW HYBRID CATHETER-TIP TACTILE SENSOR WITH HARDNESS MEASURING  
CAPABILITY FOR USE IN MINIMALLY INVASIVE HEART SURGERY**  
M.R. Ahmadi<sup>1</sup>, D.R. Dargahi<sup>1</sup>, D.R. Packirisamy<sup>1</sup>, and D.R. Cecere<sup>2</sup>  
<sup>1</sup>Concordia University, CANADA and <sup>2</sup>McGill University, CANADA
- B2P-K12    **PRINTED ELECTROCHEMICAL BASED BIOSENSORS ON FLEXIBLE SUBSTRATES**  
R. Avuthu, B. Narakathu, M. Joyce, M. Rebros, E. Hrehorova, and M. Atashbar  
Western Michigan University, USA
- B2P-K13    **FLEXIBLE NEURAL MICROELECTRODE ARRAYS REINFORCED WITH EMBEDDED  
METALLIC MICRO-NEEDLES**  
A. Fomani and R. Mansour  
University of Waterloo, CANADA

- B2P-K14 **A DISPOSABLE POLYMER WAVEGUIDE LAB-ON-A-CHIP FOR REAL-TIME DETECTION OF PROTEIN C USING EVANESCENT WAVE**  
S.H. Lee, D.J. Oh, J.H. Jung, and J.Y. Kang  
*Korea Institute of Science and Technology (KIST), KOREA, SOUTH*
- B2P-K15 **DEVELOPMENT OF A THREE DIMENSIONAL (3-D) SILICON MICRO-ARRAY FOR CELL CAPTURING**  
M. Nikkhah, J.S. Strobl, and M. Agah  
*Virginia Polytechnic Institute and State University, USA*
- B2P-K16 **POST-CMOS PARYLENE PACKAGING FOR ON-CHIP BIOSENSOR ARRAYS**  
L. Li and A. Mason  
*Michigan State University, USA*
- B2P-K17 **DIFFRACTOMETRIC BIOCHEMICAL SENSING WITH SMART HYDROGELS**  
C.L. Chang, Z.W. Ding, V. Patchigolla, B. Ziaie, and C.A. Savran  
*Purdue University, USA*
- B2P-K18 **DNA-BASED NANO-BIOSENSOR FOR THE DETECTION OF PROTEIN**  
H.J. Kim and B. Hong  
*Sungkyunkwan University, KOREA, SOUTH*
- B2P-K19 **MODELING SENSING MECHANISMS IN CARBON NANOTUBE BIOSENSORS**  
G.B. Abadir, K. Walus, and D.L. Pulfrey  
*University of British Columbia, CANADA*
- B2P-K20 **A NOVEL MICRODROPLET CASSETTE FOR BIOCHEMICAL SCREENING**  
L.L. Wu, Y. Zhang, W. Xu, G.P. Li, and M. Bachman  
*University of California, Irvine, USA*
- B2P-K21 **A FULLY MICROFABRICATED COPLANAR SINGLE WALLED CARBON NANOTUBE**  
J.H. Kim<sup>1</sup>, J.Y. Lee<sup>1</sup>, C.W. Park<sup>2</sup>, and N.K. Min<sup>1</sup>  
*<sup>1</sup>Korea University, KOREA, SOUTH and <sup>2</sup>Kangwon University, KOREA, SOUTH*
- B2P-K22 **ELECTRODE DESIGN FOR HIGH IMPEDANCE CHANGE OF COULTER BASED CELL COUNTER**  
J. Kim, H. Krause, J. Park, M. Mueller, and S. Beck  
*Korea Institute of Science and Technology (KIST) Europe Forschungsgesellschaft mbH, GERMANY*
- B2P-K23 **PVDF ULTRASONIC TRANSDUCER WITH PDMS MICROFLUIDIC CHANNEL FOR THE ACOUSTICAL CHARACTERIZATION OF BIO CELLS**  
M. Jung and J.H. Lee  
*Gwangju Institute of Science and Technology (GIST), KOREA, SOUTH*
- B2P-K24 **RAPID DETECTION OF DNA HYBRIDIZATION ON SURFACE PLASMON RESONANCE BASED MICROARRAYS**  
A. Kick<sup>1</sup>, M. Bönsch<sup>1</sup>, A. Herr<sup>2</sup>, W. Brabetz<sup>2</sup>, M. Jung<sup>2</sup>, F. Sonntag<sup>3</sup>, and M. Mertig<sup>1</sup>  
*<sup>1</sup>Technische Universität Dresden, GERMANY, <sup>2</sup>Biotype Diagnostic GmbH, GERMANY, and <sup>3</sup>Fraunhofer Institute for Material and Beam Technology, GERMANY*

## **POSTER SESSION W5 - Optical Sensors**

- B2P-L1 **DIFFUSE-LIGHT ABSORPTION SPECTROSCOPY AND CHEMOMETRICS FOR DISCRIMINATION AND QUANTIFICATION OF EXTRA VIRGIN OLIVE OIL ADULTERANTS**  
A.G. Mignani<sup>1</sup>, L. Ciaccheri<sup>1</sup>, H. Ottevaere<sup>2</sup>, H. Thienpont<sup>2</sup>, L. Conte<sup>3</sup>, M. Marega<sup>3</sup>, A. Cichelli<sup>4</sup>, C. Attilio<sup>1</sup>, and A. Cimato<sup>1</sup>  
*<sup>1</sup>Consiglio Nazionale delle Ricerche (CNR), ITALY, <sup>2</sup>Vrije Universiteit Brussel, BELGIUM, and <sup>3</sup>Università degli Studi di Udine, ITALY, <sup>4</sup>Università degli Studi G. D'Annunzio (DASTA), ITALY*

- B2P-L2     **OPTICAL SENSING OF SOLVENTS USING SELECTIVE TENSILE EFFECTS OF A PDMS-COATED FIBER BRAGG GRATING**  
K.-I. Joo<sup>1</sup>, C.-S. Park<sup>1</sup>, Y.J. Han<sup>1</sup>, Y.W. Lee<sup>2</sup>, S.H. Kong<sup>1</sup>, S.-W. Kang<sup>1</sup>, and H.-R. Kim<sup>1</sup>  
*<sup>1</sup>Kyungpook National University, KOREA, SOUTH and <sup>2</sup>Pukyung National University, KOREA, SOUTH*
- B2P-L3     **IN-PIXEL BURIED-CHANNEL SOURCE FOLLOWER IN CMOS IMAGE SENSORS EXPOSED TO X-RAY RADIATION**  
Y. Chen<sup>1</sup>, J. Tan<sup>1</sup>, X. Wang<sup>2</sup>, A.J. Mierop<sup>3</sup>, and A.J.P. Theuwissen<sup>1</sup>  
*<sup>1</sup>Delft University of Technology, THE NETHERLANDS, <sup>2</sup>CMOSIS nv, BELGIUM, and <sup>3</sup>DALSA B.V., THE NETHERLANDS*
- B2P-L4     **LOW-POWER AND HIGH-SPEED CURRENT-MODE CMOS IMAGER WITH 1T BIASING SCHEME**  
F. Tang and A. Bermak  
*Hong Kong University of Science and Technology, HONG KONG*
- B2P-L5     **AN OPTICAL COLLISION AVOIDANCE SENSOR FOR UNMANNED AIR VEHICLES**  
C. Minwalla<sup>1</sup>, M. Tekeste<sup>1</sup>, K. Watters<sup>1</sup>, P. Thomas<sup>2</sup>, R. Hornsey<sup>2</sup>, K. Ellis<sup>3</sup>, and S. Jennings<sup>3</sup>  
*<sup>1</sup>York University, CANADA, <sup>2</sup>Topaz Technology Inc., CANADA, and <sup>3</sup>NRC Canada, CANADA*
- B2P-L6     **OPTICAL FIBRE RADIATION DOSIMETRY FOR LOW DOSE APPLICATIONS**  
D. McCarthy, S. O'Keeffe, and E. Lewis  
*University of Limerick, IRELAND*
- B2P-L7     **A HYBRID FIBER OPTIC SENSING SYSTEM FOR STRUCTURAL HEALTH MONITORING**  
S.K. Ghorai, S. Sengupta, S. Sidhishwari, and D.R. Roy  
*Birla Institute of Technology, INDIA*
- B2P-L8     **FIBER-OPTIC TWO-PHOTON FLUORESCENCE CORRELATION SPECTROSCOPY FOR REMOTE CELL FLOW VELOCITY MEASUREMENTS**  
Y.-C. Chang<sup>1</sup>, J.Y. Ye<sup>2</sup>, T. Thomas<sup>2</sup>, J. Baker Jr.<sup>2</sup>, and T. Norris<sup>2</sup>  
*<sup>1</sup>National Changhua University of Education, TAIWAN and <sup>2</sup>University of Michigan, USA*
- B2P-L9     **GROOVED FIBER SENSORS FOR DEFORMATION IMAGING**  
N. Nurgiyatna, P.J. Scully, and K.B. Ozanyan  
*University of Manchester, UK*
- B2P-L10    **OPTICAL HYDROGEN SENSING WITH METALLIC PHOTONIC CRYSTALS AND PLASMONIC METAMATERIALS**  
H. Giessen, P. Mai, A. Tittl, N. Liu, C. Grossmann, A. Seidel, R. Orzekowsky, and T. Meyrath  
*University of Stuttgart, GERMANY*
- B2P-L11    **OPTIMIZED MARKS FOR QUALITATIVE MATERIAL DISCRIMINATION**  
O.M. Conde, L. Uriarte, P.B. Garcia-Allende, A.M. Cubillas, and J.M. Lopez-Higuera  
*University of Cantabria, SPAIN*
- B2P-L12    **DESIGN AND ANALYSIS OF A NOVEL ELECTRO-OPTICAL MEMS GYROSCOPE FOR NAVIGATION APPLICATIONS**  
R.L. Waters, C.H. Tally, B.B. Dick, H. Jazo, M.S. Fralick, M.M Kerber, and A. Wang  
*Space and Naval Warfare Systems Center Pacific, USA*
- B2P-L13    **MISMATCH COMPENSATION FOR DARK CURRENT SUPPRESSION IN CMOS**  
D.M. Sander and P.A. Abshire  
*University of Maryland, USA*
- B2P-L14    **LASER-DRIVEN FIBER OPTIC GYROSCOPE WITH LOW NOISE AND DRIFT**  
S. Lloyd, M. Dignonnet, and S. Fan  
*Stanford University, USA*

- B2P-L15    **PH SENSING BASED ON THIN FILM HYDROGEL COATED SILICON GRATINGS**  
A. Mudraboyina, J.A.N. Markowski, and J. Sabarinathan  
*University of Western Ontario, CANADA*
- B2P-L16    **FLUORESCENT IMAGING AND LOCALIZATION WITH ANGLE SENSITIVE PIXEL ARRAYS IN STANDARD CMOS**  
A Wang, P. Gill, and A. Molnar  
*Cornell University, USA*
- B2P-L17    **PD COATED EDGE-EMITTING LASERS FOR HYDROGEN SENSING APPLICATIONS**  
B. Griffin, C. Chang, A. Arbabi, and L. Goddard  
*University of Illinois, Urbana-Champaign, USA*
- B2P-L18    **COMPOSITE CAVITY OPTICAL FIBER LASER SENSOR BASED ON WEAK FEEDBACK EFFECT**  
J.Z. Zhang<sup>1</sup>, Q. Chai<sup>1</sup>, X.L. Li<sup>1</sup>, Q.Q. Hao<sup>1</sup>, Q. Li<sup>1</sup>, W.M. Sun<sup>1</sup>, L.B. Yuan<sup>1</sup>, P. Lu<sup>2</sup>, and G.D. Peng<sup>3</sup>  
<sup>1</sup>Harbin Engineering University, CHINA, <sup>2</sup>Communications Research Centre, CANADA, and <sup>3</sup>University of New South Wales, AUSTRALIA

### **POSTER SESSION W6 - Mechanical & Physical Sensors**

- B2P-M1    **MAGNETIC SENSOR EMPLOYING PIEZOELECTRIC CERAMIC/RARE-EARTH IRON ALLOY/HIGH-PERMEABILITY FECUNBSIB COMPOSITE**  
P. Li, L.E.I. Chen, Y. Wen, D. Wang, and X. Huang  
*Chongqing University, CHINA*
- B2P-M2    **DIGITAL CLOSED-LOOP CONTROL BASED ON ADAPTIVE FILTER FOR DRIVE MODE OF A MEMS GYROSCOPE**  
D.C. Liu, N.N. Lu, J. Cui, L.T. Lin, H.T. Ding, Y.L. Hao, Z.C. Yang, and G.Z Yan  
*Peking University, CHINA*
- B2P-M3    **A NOVEL LATERALLY DRIVEN MICROMACHINED RESONANT PRESSURE SENSOR**  
D. Chen, Y. Li, M. Liu, and J. Wang  
*Chinese Academy of Sciences, CHINA*
- B2P-M4    **OPTICAL MEMS VIBRATION SENSOR**  
W. Hortschitz<sup>1</sup>, M. Sachse<sup>1</sup>, H. Steiner<sup>1</sup>, F. Kohl<sup>1</sup>, J. Schalko<sup>2</sup>, F. Keplinger<sup>2</sup>, and T. Sauter<sup>1</sup>  
<sup>1</sup>Austrian Academy of Sciences, AUSTRIA and <sup>2</sup>Vienna University of Technology, AUSTRIA
- B2P-M5    **IMPLEMENTATION OF A FLEXIBLE SILICON-BASED TACTILE SENSOR ARRAY**  
W. Fang, C.-F. Hu, H.-Y. Huang, C.-C. Wen, and L.-Y. Lin  
*National Tsing Hua University, TAIWAN*
- B2P-M6    **A SEMI-NUMERICAL MODEL OF A LATERAL FIELD EXCITED PIEZO-ELECTRIC FLUID SENSOR**  
T. Voglhuber-Brunnmaier, A.O. Niedermayer, and B. Jakoby  
*Johannes Kepler University, AUSTRIA*
- B2P-M7    **NO-POWER VACUUM ACTUATED BI-STABLE MEMS SPDT SWITCH**  
U. Gowrishetty, K. Walsh, and D. Jackson  
*University of Louisville, USA*
- B2P-M8    **DOUBLE MEMBRANE SENSORS FOR LIQUID VISCOSITY AND MASS DENSITY FACILITATING MEASUREMENTS IN A LARGE FREQUENCY RANGE**  
M. Heinisch<sup>1</sup>, E.K. Reichel<sup>2</sup>, T. Voglhuber-Brunnmaier<sup>1</sup>, and B. Jakoby<sup>1</sup>  
<sup>1</sup>Johannes Kepler University, AUSTRIA and <sup>2</sup>Katholike Universiteit Leuven, BELGIUM

- B2P-M9     **CAPACITIVE ICING MEASUREMENT IN A 220 KV OVERHEAD POWER LINE ENVIRONMENT**  
M. Moser, T. Bretterkieber, H. Zangl, and G. Brasseur  
*Graz University of Technology, AUSTRIA*
- B2P-M10    **TIME-GATED TECHNIQUE FOR CONTACTLESS ELECTROMAGNETIC INTERROGATION OF MEMS RESONATORS**  
M. Bau', V. Ferrari, D. Marioli, and E. Tonoli  
*University of Brescia, ITALY*
- B2P-M11    **ASSESSING MICROMECHANICAL SENSOR CHARACTERISTICS VIA OPTICAL AND ELECTRICAL METROLOGY**  
G. Langfelder<sup>1</sup>, A. Tocchio<sup>1</sup>, M.J. Thompson<sup>2</sup>, G.M. Jaramillo<sup>2</sup>, and D.A. Horsley<sup>2</sup>  
*<sup>1</sup>Politecnico di Milano, ITALY and <sup>2</sup>University of California, Davis, USA*
- B2P-M12    **LARGE-STRAIN, SPRAY-ON STRAIN GAUGES**  
M. Kujawski, K. Miller, and E. Smela  
*University of Maryland, USA*
- B2P-M13    **SILICON MULTI-STAGE CURRENT-MODE PIEZORESISTIVE PRESSURE SENSOR**  
G.O. Coraucci and F. Fruett  
*University of Campinas, BRAZIL*
- B2P-M14    **RESONANCE FREQUENCY TUNING METHOD USING CNT WIRE SYNTHESIS**  
J. Sung, J. Kim, T. An, S. Seok, J. Heo, and G. Lim  
*Pohang University of Science and Technology (POSTECH), KOREA, SOUTH*
- B2P-M15    **A SURFACE-MICROMACHINED MEMS ACOUSTIC SENSOR WITH 0.8 UM CMOS IMPEDANCE TRANSDUCER**  
J. Lee, C.H. Je, W.S. Yang, and J. Kim  
*Electronics and Telecommunications Research Institute (ETRI), KOREA, SOUTH*
- B2P-M16    **SUB-PICOGRAM RESOLUTION MASS SENSING IN A LIQUID ENVIRONMENT USING LOW-LOSS QUARTZ CRYSTAL MICROBALANCE**  
C.R. Kirkendall, and J.W. Kwon  
*University of Missouri, Columbia, USA*
- B2P-M17    **HIGH-PERFORMANCE CAPACITIVE MICROACCELEROMETER USING LARGE PROOF-MASS AND HIGH-AMPLITUDE SENSE VOLTAGE**  
M. Yoo and K.-H. Han  
*Inje University, KOREA, SOUTH*
- B2P-M18    **A NOVEL 3D CMOS MICRO-FLUXGATE MAGNETIC SENSOR FOR LOW MAGNETIC FIELD DETECTION**  
W.S. Huang<sup>1</sup>, J.T. Jeng<sup>2</sup>, and C.C. Lu<sup>1</sup>  
*<sup>1</sup>National Taipei University of Technology, TAIWAN and <sup>2</sup>National Kaohsiung University of Applied Sciences, TAIWAN*
- B2P-M19    **COMPACT FLUXGATE SENSOR WITH A VECTOR COMPENSATION OF A MEASURED MAGNETIC FIELD**  
V. Petrucha and P. Kaspar  
*Czech Technical University in Prague, CZECH REP.*
- B2P-M20    **METHOD FOR SENSITIVITY IMPROVEMENT AND ROBUST DESIGN OF A PIEZORESISTIVE PRESSURE SENSOR**  
W. Fang, H.-S. Hsieh, H.-C. Chang, and C.-F. Hu  
*National Tsing Hua University, TAIWAN*

- B2P-M21 **SURFACE-SHAPE CAPTURE WITH BOUNDARY ELECTRODES**  
 A.G. Kirk<sup>1</sup>, C.C. Ho<sup>1</sup>, and D.G. Garmire<sup>2</sup>  
*<sup>1</sup>Univeristy of California, Berkeley, USA and <sup>2</sup>University of Hawaii, Manoa, USA*
- B2P-M22 **HAIR-LIKE AIRFLOW SENSING WITH PIEZOELECTRIC VIBRATING DIAPHRAGM**  
 J.M. Miao<sup>1</sup>, T. Xu<sup>1</sup>, and L. Norford<sup>2</sup>  
*<sup>1</sup>Nanyang Technological University, SINGAPORE and <sup>2</sup>Massachusetts Institute of Technology, USA*

## **POSTER SESSION W7 - Sensor Networks**

- B2P-N1 **ADAPTIVE SWARM INTELLIGENCE ROUTING ALGORITHMS FOR WSN IN A CHANGING ENVIRONMENT**  
 D. Bruneo<sup>1</sup>, M. Scarpa<sup>1</sup>, A. Bobbio<sup>2</sup>, D. Cerotti<sup>2</sup>, and M. Gribaudo<sup>3</sup>  
*<sup>1</sup>Università di Messina, ITALY, <sup>2</sup>Università del Piemonte Orientale, ITALY, and <sup>3</sup>Politecnico di Milano, ITALY*
- B2P-N2 **SENSOR AUTHENTICATION SCHEME FOR CLUSTERING ROUTING PROTOCOLS IN WIRELESS SENSOR NETWORKS**  
 S. Lee and K. Kim  
*Gwangju Institute of Science and Technology (GIST), KOREA, SOUTH*
- B2P-N3 **ENERGY EFFICIENCY AND PACKET ERROR RATE IN WIRELESS SENSOR NETWORKS WITH COOPERATIVE RELAY**  
 L. Shi, and A. Fapojuwo  
*University of Calgary, CANADA*
- B2P-N4 **DEPENDABILITY EVALUATION OF WIRELESS SENSOR NETWORKS: REDUNDANCY AND TOPOLOGICAL ASPECTS**  
 D. Bruneo, A. Puliafito, and M. Scarpa  
*Università di Messina, ITALY*
- B2P-N5 **MOBILE TARGETS REGION-OF-INTEREST VIA DISTRIBUTED PYROELECTRIC SENSOR NETWORK: TOWARDS A ROBUST, REAL-TIME CONTEXT REASONING**  
 F. Hu, Q. Sun and Q. Hao  
*University of Alabama, USA*
- B2P-N6 **OCEAN OBSERVATORY SENSOR NETWORK MIDDLEWARE APPLICATION**  
 R.A. Herlien<sup>1</sup>, T.C. O'Reilly<sup>1</sup>, K.L. Headley<sup>1</sup>, D.R. Edgington<sup>1</sup>, S.S. Tilak<sup>2</sup>, T.R. Fountain<sup>2</sup>, and P. Shin<sup>2</sup>  
*<sup>1</sup>Monterey Bay Aquarium Research Institute, USA and <sup>2</sup>University of California, San Diego, USA*
- B2P-N7 **ENERGY-EFFICIENT MODEL INFERENCE IN WIRELESS SENSING: ASYMMETRIC DATA PROCESSING**  
 P.G. Flikkema  
*Northern Arizona University, USA*
- B2P-N8 **A PROPOSAL OF DISASTER INFORMATION SYSTEM BASED ON THE INTERNET TECHNOLOGIES**  
 K. Hiroi, M. Yamanouchi, and H. Sunahara  
*Keio University, JAPAN*
- B2P-N9 **SMART SPATIALLY-AWARE SENSING AND ACTUATION SYSTEM**  
 J.A. Baloch and B.S. Hoyle  
*University of Leeds, UK*

## POSTER SESSION W8 - Applications

- B2P-P1     **A SYSTEM TO SENSE NEAR-SURFACE ATMOSPHERIC GASES OF POSSIBLE BIOLOGICAL ORIGIN ON MARS**  
G.T. Anderson<sup>1</sup>, E. Wilson<sup>2</sup>, J. Tolson<sup>1</sup>, C. Sheesley<sup>1</sup>, E. Tunstel<sup>3</sup>, S. Mohammed<sup>1</sup>, S. Mahdi<sup>1</sup>, I. Mohammad<sup>1</sup>  
<sup>1</sup>University of Arkansas, USA, <sup>2</sup>Harding University, USA,  
<sup>3</sup>Johns Hopkins University Applied Physics Laboratory, USA
- B2P-P2     **PULSE SPECTROSCOPY SYSTEM FOR NON-INVASIVE REAL TIME BLOOD VOLUME MONITORING OF THE HEART**  
S. Andruschenko<sup>1</sup>, U. Timm<sup>2</sup>, S. Koball<sup>1</sup>, M. Hinz<sup>1</sup>, J. Kraitl<sup>1</sup>, E. Lewis<sup>2</sup>, H. Ewald<sup>1</sup>  
<sup>1</sup>University of Rostock, GERMANY and <sup>2</sup>University of Limerick, IRELAND
- B2P-P3     **CHARACTERIZATION AND OPTIMIZATION OF A NOVEL ELECTROMAGNETIC TRANSDUCTION TECHNIQUE FOR ROTATIONAL ENERGY HARVESTING**  
M. Fralick, B. Dick, H. Jazo, T. Russin, and R.L. Waters  
*Space and Naval Warfare Systems Center Pacific, USA*
- B2P-P4     **HIGHLY MINIATURIZED MACROPOROUS AU-/NPTS HYBRID CATALYTIC ELECTRODE FOR NONENZYMATIC GLUCOSE BIOFUEL CELL APPLICATIONS**  
Y.J. Lee, and J.Y. Park  
*Kwangwoon University, KOREA, SOUTH*
- B2P-P5     **POSITION TRACKING SYSTEM FOR COMMODITIES IN AN INDOOR ENVIRONMENT**  
K. Murakami<sup>1</sup>, T. Hasegawa<sup>1</sup>, K. Shigematsu<sup>1</sup>, F. Sueyasu<sup>1</sup>, Y. Nohara<sup>1</sup>, B.W. Ahn<sup>2</sup>, and R. Kurazume<sup>2</sup>  
<sup>1</sup>Kyushu University, JAPAN and <sup>2</sup>Mokpo Maritime University, KOREA
- B2P-P6     **COMPUTATIONAL DESIGN OF QUARTZ CRYSTAL NANO BALANCE FOR UNIFORM SENSITIVITY DISTRIBUTION**  
R. Singh<sup>1</sup>, S. Sankaranarayanan<sup>2</sup> and V.R. Bhethanabotla<sup>1</sup>  
<sup>1</sup>University South Florida, USA and <sup>2</sup>Argonne National Laboratory, USA
- B2P-P7     **ADAPTIVE TUNABLE LASER SPECTROMETER FOR SPACE APPLICATIONS**  
G. Flesch and D. Keymeulen  
*Jet Propulsion Laboratory, USA*
- B2P-P8     **DEVELOPMENT OF AN OPTICAL SURFACE CHARACTERIZATION SENSOR FOR SIMULTANEOUSLY MEASURING BOTH 3-D SURFACE TEXTURE AND MECHANICAL PROPERTIES**  
Y. Shen<sup>1</sup>, Y. Wang<sup>2</sup>, and J. Zaklit<sup>1</sup>  
<sup>1</sup>University of Nevada, Reno, USA and <sup>2</sup>Shanghai Jiaotong University, CHINA
- B2P-P9     **DESIGN AND FABRICATION OF MEMS TEST SOCKET FOR BGA IC PACKAGE**  
S.W. Kim<sup>1</sup>, D.Y. Gong<sup>1</sup>, C.S. Cho<sup>1</sup>, J.W. Nam<sup>2</sup>, B.H. Kim<sup>3</sup>, and J.H. Lee<sup>1</sup>  
<sup>1</sup>Kyungpook National University, KOREA, SOUTH, <sup>2</sup>Lumsonic Co. Ltd., KOREA, SOUTH, and  
<sup>3</sup>Catholic University of Daegu, KOREA, SOUTH
- B2P-P10    **A SMART FOREST-FIRE EARLY DETECTION SENSORY SYSTEM: ANOTHER APPROACH OF UTILIZING WIRELESS SENSOR AND NEURAL NETWORKS**  
H. Soliman, K. Sudan, and A. Mishra  
*New Mexico Institute of Mining and Technology, USA*
- B2P-P11    **A BROADBAND VIBRATION ENERGY HARVESTER USING MAGNETOELECTRIC TRANSDUCER**  
J. Yang, Y. Wen, P. Li, X. Dai, and M. Li  
*Chongqing University, CHINA*

- B2P-P12 **ATMOSPHERIC PLASMA JET FROM A MICRO NOZZLE ARRAY AND ITS BIOLOGICAL EFFECTS ON LIVING CELLS FOR CANCER THERAPY**  
K. Kim<sup>1</sup>, J.D. Choi<sup>2</sup>, G. Kim<sup>1</sup>, J.S. Lee<sup>1</sup>, and S.S. Yang<sup>1</sup>  
*<sup>1</sup>Ajou University, KOREA, SOUTH and <sup>2</sup>Seoul University, KOREA, SOUTH*
- B2P-P13 **GRAVITATION AND NEGATIVE DIELECTROPHORETIC FORCE BASED HIGH-THROUGHPUT SORTING PLATFORM FOR HUMAN BREAST CANCER CELL (MCF 7) IN DILUTED RED BLOOD CELL**  
Y.H. Kim<sup>1</sup>, J.H. Lee<sup>1</sup>, S.H. Park<sup>2</sup>, and B.K. Kim<sup>1</sup>  
*<sup>1</sup>Korea Aerospace University, KOREA, SOUTH and <sup>2</sup>Chonnam National University, KOREA, SOUTH*
- B2P-P14 **NANOWATT-POWER-LEVEL AUTOMATIC SWITCH CIRCUIT COMBINING CMOS AND PHOTODIODE**  
F. Utsunomiya and T.D. Douseki  
*Ritsumeikan University, JAPAN*
- B2P-P15 **WATCH YOUR HEAD: A WEARABLE COLLISION WARNING SENSOR SYSTEM FOR THE BLIND**  
B. Jameson and R. Manduchi  
*Univeristy of California, Santa Cruz, USA*
- B2P-P16 **VISION-BASED DISPLACEMENT SENSOR FOR MONITORING DYNAMIC RESPONSE USING ROBUST OBJECT SEARCH ALGORITHM**  
Y. Fukuda<sup>1</sup>, Y. Narita<sup>2</sup>, S. Kaneko<sup>2</sup>, M. Feng<sup>1</sup>, and T. Tanaka<sup>2</sup>  
*<sup>1</sup>University of California, Irvine, USA and <sup>2</sup>Hokkaido University, JAPAN*
- B2P-P17 **FAST CELL IMMOBILIZATION BY USING NON-IMMUNOLOGICAL METHOD FOR CELL BASED BIOSENSOR**  
J. Park<sup>1</sup>, M. Mueller<sup>1</sup>, J. Kim<sup>1</sup>, L.-Y. Hong<sup>2</sup>, D.-P. Kim<sup>2</sup>, and H. Seidel<sup>3</sup>  
*<sup>1</sup>Korea Institute of Science and Technology (KIST) Europe Forschungsgesellschaft mbH, GERMANY, <sup>2</sup>Chungnam National University, KOREA, SOUTH, and <sup>3</sup>University of Saarland, GERMANY*
- B2P-P18 **VEHICLE DETECTION FROM AERIAL VISUAL IMAGERY**  
C. Ippolito, and A. Nefian  
*NASA Ames Research Center, USA and Carnegie Mellon University, USA*

12:15 - **Lunch and Exhibit Inspection**  
13:15

## **SPECIAL SESSION B3L-A Force Sensing Applications**

- 13:15 *Invited*  
B3L-A1 **OPTIMIZATION WITH PROCESS LIMITS AND APPLICATION REQUIREMENTS FOR FORCE SENSORS**  
B.L. Pruitt, S.J. Park, J.C. Doll, and N. Harjee  
*Stanford University, USA*
- 13:45  
B3L-A3 **NONLINEAR PIEZORESISTANCE BEHAVIOUR OF SILICON**  
B. Lemke, M.E. Schmidt, J. Gutmann, P. Gieschke, J. Gaspar and O. Paul  
*University of Freiburg - IMTEK, GERMANY*
- 14:00  
B3L-A4 **FABRICATION OF POLYMER CANTILEVER INTEGRATED FULL-BRIDGE AS A PIEZORESISTIVE SENSOR**  
A.J.H. Ahn and L.D.W. Lee  
*Chonnam National University, KOREA, SOUTH*

14:15

B3L-A5

**PIEZORESISTIVE RESONANT CANTILEVER SELF-ASSEMBLED WITH SPECIFIC-GROUP-MODIFIED CNTS FOR DETECTION OF TRACE-LEVEL VOC VAPORS**

P.C. Xu<sup>1</sup>, H.T. Yu<sup>2</sup>, and X.X. Li<sup>2</sup>

<sup>1</sup>Chinese Academy of Science, CHINA and

<sup>2</sup>Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, CHINA

14:30

B3L-A6

**COAXIAL TIP PIEZORESISTIVE SCANNING PROBES WITH SUB-NANOMETER VERTICAL DISPLACEMENT RESOLUTION**

N. Harjee, A.J. Haemmerli, D. Goldhaber-Gordon, and B.L. Pruitt

Stanford University, USA

**SESSION B3L-B Bio Sensing Systems and Applications**

13:15

B3L-B1

**MULTI-POINT ATP SENSING FOR RAPID PRECISE FISH FRESHNESS CHECK**

D. Itoh<sup>1</sup>, T. Nishi<sup>2</sup>, S. Murata<sup>3</sup>, and H. Suzuki<sup>1</sup>

<sup>1</sup>University of Tsukuba, JAPAN, <sup>2</sup>Fujidenolo Co., Ltd., JAPAN, and

<sup>3</sup>National Research Institute of Fisheries Science, JAPAN

13:30

B3L-B2

**DIGITAL MICROFLUIDIC CHIP FOR RAPID PORTABLE DETECTION OF MERCURY (II)**

X. Liu<sup>1</sup>, T. Li<sup>2</sup>, Q. Yang<sup>1</sup>, L. Wang<sup>1</sup>, C. Fan<sup>1</sup>, P. Zhou<sup>2</sup>, and Y. Wang<sup>2</sup>

<sup>1</sup>Chinese Academy of Science, CHINA and

<sup>2</sup>Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Science, CHINA

13:45

B3L-B3

**WIRELESS TRANSMISSION OF SENSOR SIGNALS FOR PHONOCARDIOLOGY APPLICATIONS**

A. Sa-Ngasoongsong and S. Bukkapatnam

Oklahoma State University, USA

14:00

B3L-B4

**CYLINDRICAL MULTIPHASE INTERFACES IN MICROFLUIDIC CHANNELS FOR LAB-ON-A-CHIP**

D. Cheng and H. Jiang

University of Wisconsin, USA

14:15

B3L-B5

**NOVEL PDMS LEAKY WAVEGUIDE WITH SELF-ASSEMBLED GOLD NANO-PARTICLES FOR SSDNA DETECTION**

C.H. Lin, Y.C. Chen, and W.L. Tseng

National Sun Yat-sen University, TAIWAN

14:30

B3L-B6

**NOVEL FLOW CYTOMETRER UTILYZING WAVELENGTH-RESOLVED DETECTION UNDER A DIASCOPIIC ILLUMINATION CONFIGURATION**

S.W. Lin<sup>1</sup>, C.H. Chang<sup>1</sup>, L.M. Fu<sup>2</sup>, and C.H. Lin<sup>3</sup>

<sup>1</sup>National Cheng Kung University, TAIWAN, <sup>2</sup>National Pingtung University of Science and Technology,

TAIWAN, and <sup>3</sup>National Sun Yat-sen University, TAIWAN

**SESSION B3L-C Resonators**

13:15

B3L-C1

**A MICROMECHANICAL RESONATOR TO REACH THE QUANTUM REGIME**

M. Bahriz<sup>1</sup>, O. Ducloux<sup>1</sup>, S. Masson<sup>1</sup>, J.D. Janiaud<sup>1</sup>, O. Le Traon<sup>1</sup>, A. Kuhn<sup>2</sup>, and A. Heidmann<sup>2</sup>

<sup>1</sup>ONERA, FRANCE and <sup>2</sup>Laboratoire Kastler Brossel, FRANCE

13:30  
B3L-C2 **GEOMETRICAL OPTIMIZATION OF RESONANT CANTILEVERS VIBRATING IN IN-PLANE BENDING MODE**

L.A. Beardslee<sup>1</sup>, A.M. Addous<sup>1</sup>, K.S. Demirci<sup>1</sup>, S.M. Heinrich<sup>2</sup>, F. Josse<sup>2</sup>, and O. Brand<sup>1</sup>  
<sup>1</sup>Georgia Institute of Technology, USA and <sup>2</sup>Marquette University, USA

13:45  
B3L-C3 **DETECTION AND MASS MEASUREMENT OF INDIVIDUAL AIR-BORNE PARTICLES USING HIGH FREQUENCY MICROMECHANICAL RESONATORS**

A. Hajjam, J. Wilson, A. Rahafrooz, and S. Pourkamali  
University of Denver, USA

14:00  
B3L-C4 **HYDRODYNAMICS OF CLAMPED-CLAMPED MICROMECHANICAL RESONATORS**

W.J. Venstra, H.J.R. Westra, and H.S.J. van der Zant  
Kavli Institute of Nanoscience, THE NETHERLANDS

14:15  
B3L-C5 **GAN-BASED LAMB-WAVE MASS-SENSORS ON SILICON SUBSTRATES**

C.M. Lee, K.M. Wong, P. Chen and K.M. Lau  
Hong Kong University of Science and Technology, HONG KONG

14:30  
B3L-C6 **NOVEL PULSE ACTUATION-READOUT SCHEME FOR BULK DISK RESONATOR BASED ULTRASENSITIVE MASS SENSOR**

A. Cagliani, M. Tang, and Z.J. Davis  
Technical University of Denmark, DENMARK

## **SESSION B3L-D Sensor Network Algorithms**

13:15  
B3L-D1 **2D COMMUNICATION SENSOR NETWORKS USING SINGLE FREQUENCY FOR CONCURRENT POWER SUPPLY AND DATA TRANSMISSION**

T. Oota<sup>1</sup>, A.O. Lim<sup>2</sup>, K. Hattori<sup>3</sup>, Y. Kado<sup>1</sup>, and B. Zhang<sup>1</sup>  
<sup>1</sup>National Institute of Information Communications Technology, JAPAN and <sup>2</sup>Japan Advanced Institute Science Technology (JAIST), JAPAN, <sup>3</sup>University of Electro-Communications, JAPAN

13:30  
B3L-D2 **CLOCK SYNCHRONIZATION SIMULATION FOR WIRELESS SENSOR NETWORKS**

F. Ring, G. Gaderer, A. Nagy, and P. Loschmidt  
Austrian Academy of Sciences, AUSTRIA

13:45  
B3L-D3 **GENERALIZED VERNIER EFFECT AND ITS APPLICATION TO PRECISE RF TIME-OF-FLIGHT MEASUREMENT FOR WIRELESS SENSOR NETWORKS**

S.I. Ko, G. Aikawa, J. Takayama, and S. Ohyama  
Tokyo Institute of Technology, JAPAN

14:00  
B3L-D4 **SENSOR NODE LOCALIZATION USING WEIGHTED AND ITERATIVE MAXIMUM LIKELIHOOD**

Y. Endo and T. Miyazaki  
University of Aizu, JAPAN

14:15  
B3L-D5 **RF-BASED CONNECTIVITY MANAGEMENT OF AERIAL SENSORS NETWORKS FOR 3D COVERAGE OPTIMIZATION**  
K. Daniel, S. Rohde, N. Goddemeier, and C. Wietfeld  
*Technische Universität Dortmund, GERMANY*

14:30  
B3L-D6 **THE SPANISH INQUISITION PROTOCOL - MODEL-BASED TRANSMISSION REDUCTION FOR WIRELESS SENSOR NETWORKS**  
D.J. Goldsmith, and J.P. Brusey  
*Coventry University, UK*

## **SESSION B3L-E Optical Sensing Systems II**

13:15  
B3L-E1 **CHIP-SCALE WAVELENGTH-DIVISION MULTIPLEXED INTEGRATED SENSOR ARRAYS**  
M.W. Pruessner, T.H. Stievater, W.S. Rabinovich, R. Bass, and J.B. Boos  
*Naval Research Laboratory, USA*

13:30  
B3L-E2 **HIGH-THROUGHPUT MICROPATTERNING OF OPTICAL OXYGEN SENSORS**  
H. Zhu, Y.Q. Tian, S. Bhushan, F. Su, and D. Meldrum  
*Arizona State University, USA*

13:45  
B3L-E3 **SIMULTANEOUS, SINGLE-DETECTOR FLUORESCENCE DETECTION OF MULTIPLE FLUORESCENT DYES**  
V. Jangampet<sup>1</sup>, R. Dixit<sup>1</sup>, I. Papautsky<sup>2</sup>, and D. Klotzkin<sup>1</sup>  
*<sup>1</sup>Binghamton University, USA and <sup>2</sup>University of Cincinnati, USA*

14:00  
B3L-E4 **DUALFUNCTIONAL MEMS OPTICAL DEVICE WITH COMPOUND ELECTROSTATIC ACTUATORS FOR COMPACT AND FLEXIBLE PHOTONIC NETWORKS**  
Q.H. Chen, W.G. Wu, B.C. Du, L. Li, and Y.L. Hao  
*Peking University, CHINA*

14:15  
B3L-E5 **LABEL-FREE BIOSENSING USING A NANOSTRUCTURED FABRY-PEROT INTERFEROMETER**  
T. Zhang, S. Karandikar, Z. Gong, R. Giornor, L. Que  
*Louisiana Technical University, USA*

14:30  
B3L-E6 **OPTICAL SENSORS FOR A SYNERGISTICALLY CONTROLLED OSTEOTOMY SYSTEM**  
A. Korff, A. Follmann, T. Fuertjes, T. Jalowy, and K. Radermacher  
*RWTH Aachen University, GERMANY*

14:45 -  
15:15 **Break and Exhibit Inspection**

## **SPECIAL SESSION B4L-A Piezoresistive Materials and Fundamentals**

15:15 *Invited*  
B4L-A1 **CMOS INTEGRATED STRESS SENSOR SYSTEMS**  
P. Ruther, M. Baumann, P. Gieschke, M. Herrmann, K. Seidl, and O. Paul  
*University of Freiburg - IMTEK, GERMANY*

- 15:45  
B4L-A3 **A ROBUST AND SENSITIVE SILICON TACTILE IMAGER WITH INDIVIDUALLY FORMED SU-8 PROTECTIVE LAYERS ON PIEZORESISTOR PIXELS**  
H. Takao<sup>1</sup>, H. Okada<sup>2</sup>, M. Ishida<sup>2</sup>, K. Terao<sup>1</sup>, T. Suzuki<sup>1</sup>, and F. Oohira<sup>1</sup>  
<sup>1</sup>Kagawa University, JAPAN and <sup>2</sup>Toyohashi University of Technology, JAPAN
- 16:00  
B4L-A4 **CHARACTERIZATION OF DIESEL INJECTORS USING PIEZORESISTIVE SENSORS**  
E. Peiner and L. Doering  
*Technische Universität Braunschweig, GERMANY*
- 16:15  
B4L-A5 **SKIN-TYPE TACTILE SENSOR USING STANDING PIEZORESISTIVE CANTILEVER FOR MICRO STRUCTURE DETECTION**  
K. Noda, K. Matsumoto, and I. Shimoyama  
*University of Tokyo, JAPAN*
- 16:30  
B4L-A6 **A PIEZORESISTIVE SENSOR FOR PRESSURE MONITORING AT INKJET NOZZLE**  
J. Wei<sup>1</sup>, T. Chu Duc<sup>2</sup>, and P.M. Sarro<sup>1</sup>  
<sup>1</sup>Delft University of Technology, THE NETHERLANDS and <sup>2</sup>Vietnam National University, VIETNAM

## **SESSION B4L-B Sensing of Cells**

- 15:15  
B4L-B1 **A DEP-ASSISTED SINGLE-CELL ELECTROPORATION CHIP WITH LOW OPERATION VOLTAGE**  
J. Wang, Q. Wu, and Z. Wang  
*Tsinghua University, CHINA*
- 15:30  
B4L-B2 **A MEMS COULTER COUNTER FOR CELL MONITORING AND DETECTION**  
Y. Wu, J.D. Benson, J.K. Critser, and M. Almasri  
*University of Missouri, Columbia, UNITED STATES*
- 15:45  
B4L-B3 **SENSING OF ANTIBODIES SECRETED BY MICROFLUIDICALLY TRAPPED CELLS VIA EXTRAORDINARY OPTICAL TRANSMISSION THROUGH NANO HOLE ARRAYS**  
S.F. Romanuik<sup>1</sup>, S.M. Grist<sup>1</sup>, B.L. Gray<sup>1</sup>, D. Hohertz<sup>1</sup>, K.L. Kavanagh<sup>1</sup>, N. Gulzar<sup>1</sup>, J.K. Scott<sup>1</sup>, A.G. Brolo<sup>2</sup>, and R. Gordon<sup>2</sup>  
<sup>1</sup>Simon Fraser University, CANADA and <sup>2</sup>University of Victoria, CANADA
- 16:00  
B4L-B4 **IMPEDANCE MEASUREMENT OF NORMAL AND CANCEROUS HUMAN BREAST CELLS USING A MICROFLUIDIC TUNNEL STRUCTURE**  
G.S. Kang, J.H. Lee, S.K. Yoo, and S.K. Lee  
*Gwangju Institute of Science and Technology (GIST), KOREA, SOUTH*
- 16:15  
B4L-B5 **A NOVEL MULTIPARAMETRIC MICROPHYSIOMETRY SYSTEM FOR DYNAMIC CELL CULTURE MONITORING**  
A. Weltin<sup>1</sup>, J. Kieninger<sup>1</sup>, I. Moser<sup>2</sup>, G. Jobst<sup>2</sup>, M. Wego<sup>3</sup>, R. Ehret<sup>3</sup>, and G. Urban<sup>1</sup>  
<sup>1</sup>University of Freiburg - IMTEK, GERMANY, <sup>2</sup>Jobst Technologies GmbH, GERMANY, and <sup>3</sup>Bionas GmbH, GERMANY

16:30  
B4L-B6 **A SENSITIVE, RAPID AND SPECIFIC TECHNIQUE FOR THE DETECTION OF ANTIGEN-SPECIFIC CELLS ON SHEAR HORIZONTAL SURFACE ACOUSTIC WAVE (SH-SAW) SENSORS**  
H.C. Hao, and D.J. Yao  
*Yao Laboratories, TAIWAN and National Tsing Hua University, TAIWAN*

### **SESSION B4L-C Resonant Chemical Sensors**

15:15  
B4L-C1 **HIGHLY SENSITIVE DETECTION OF DMMP USING A CMUT CHEMICAL SENSOR**  
H.J. Lee, K.K. Park, M. Kupnik, O. Oralkan, and B.T. Khuri-Yakub  
*Stanford University, USA*

15:30  
B4L-C2 **ORGANOPHOSPHATE SENSING WITH VIC-DIOXIMES USING QCM SENSORS**  
Z. Sen<sup>1</sup>, I. Gürol<sup>1</sup>, G. Gümüş<sup>1</sup>, V. Ahsen<sup>2</sup>, Z.Z. Öztürk<sup>2</sup>, E. Musluoglu<sup>1</sup>, and M. Harbeck<sup>1</sup>  
*<sup>1</sup>TÜBITAK Marmara Research Center, TURKEY and <sup>2</sup>Gebze Institute of Technology, TURKEY*

15:45  
B4L-C3 **DUAL-MODE PIEZO-ON-SILICON RESONANT TEMPERATURE AND HUMIDITY SENSOR FOR PORTABLE AIR QUALITY MONITORING SYSTEMS**  
J.L. Fu and F. Ayazi  
*Georgia Institute of Technology, USA*

16:00  
B4L-C4 **GUIDED SH-SAW CHARACTERIZATION OF ELASTICITY VARIATIONS OF MESOPOROUS TiO<sub>2</sub> SENSITIVE FILMS DURING HUMIDITY SORPTION**  
A. Tetelin<sup>1</sup>, L. Blanc<sup>1</sup>, G. Tortissier<sup>1</sup>, C. Boissière<sup>2</sup>, C. Dejous<sup>1</sup>, and D. Rebière<sup>1</sup>  
*<sup>1</sup>Université de Bordeaux, FRANCE and <sup>2</sup>Université Pierre et Marie Curie, FRANCE*

16:15  
B4L-C5 **APPLICATION OF ULTRASONIC TO A HYDROGEN SENSOR**  
M. Sonoyama<sup>1</sup>, H. Fujita<sup>2</sup>, and Y. Kato<sup>1</sup>  
*<sup>1</sup>Kyushu University, JAPAN and <sup>2</sup>Oriimec Corporation, JAPAN*

16:30  
B4L-C6 **A NOVEL PT-TI-O GATE SI-METAL-INSULATOR-SEMICONDUCTOR FIELD-EFFECT TRANSISTOR HYDROGEN GAS SENSOR**  
T. Usagawa and Y. Kikuchi  
*Hitachi, Ltd., JAPAN*

### **SPECIAL SESSION B4L-E Sensors Based on Metamaterials**

15:15 *Invited*  
B4L-E1 **PLASMONIC METAMATERIALS FOR LABEL-FREE BIOSENSING**  
A.V. Zayats  
*Queen's University, Belfast, UK*

15:45  
B4L-E3 **METAMATERIALS IN MICROWAVE SENSING APPLICATIONS**  
M. Puentes, M. Schüßler, A. Penirschke, C. Damm, and R. Jakoby  
*Technische Universität Darmstadt, GERMANY*

16:00  
B4L-E4 **PLANAR METAMATERIAL SENSOR BASED ON EIT**  
M.R.S. Liu<sup>1</sup>, M.R. Mesch<sup>1</sup>, M.R. Weiss<sup>1</sup>, M.R. Soenichsen<sup>2</sup>, and M.R. Giessen<sup>1</sup>  
*<sup>1</sup>University of Stuttgart, GERMANY and <sup>2</sup>University of Mainz, GERMANY*

16:15

B4L-E5

**METAMATERIAL-BASED WIRELESS RF-MEMS STRAIN SENSORS**

R. Melik<sup>1</sup>, E. Unal<sup>1</sup>, N.K. Perkgoz<sup>1</sup>, C. Puttlitz<sup>2</sup>, and H.V. Demir<sup>1</sup>

<sup>1</sup>*Bilkent University, TURKEY* and <sup>2</sup>*Colorado State University, USA*

16:30

B4L-E6

**NEAR-FIELD PROBES USING METAMATERIAL INCLUSIONS FOR ENHANCED SENSITIVITY**

O. Ramahi, Z. Ren, and M. Boybay

*University of Waterloo, CANADA*

18:00 -

21:00

**Conference Luau Banquet – *Student Paper and Best Poster Awards***

## Thursday, November 4, 2010

### 08:00 KEYNOTE PRESENTATION 3

C1K-A1 **TO INTEGRATE OR NOT TO INTEGRATE**  
P. French  
*Delft University of Technology, THE NETHERLANDS*

### SPECIAL SESSION C1L-A Piezoelectric MEMS Sensors

08:45 *Invited*  
C1L-A1 **PIEZOELECTRIC THIN FILMS FOR A HIGH FREQUENCY ULTRASOUND TRANSDUCER WITH INTEGRATED ELECTRONICS**  
F. Griggio, H. Kim, I. Kim, T.N. Jackson, K. Choi, R.L. Tutwiler, and S. Trolier-McKinstry  
*Pennsylvania State University, USA*

09:15  
C1L-A3 **TWO-AXIS SCANNING MICROMIRROR BASED ON A TILT-AND-LATERAL SHIFT-FREE PIEZOELECTRIC ACTUATOR**  
W.J. Liu<sup>1</sup>, Y.P. Zhu<sup>1</sup>, J.P. Li<sup>1</sup>, A. Virendrapal<sup>1</sup>, Y.M. Tang<sup>2</sup>, B.P. Wang<sup>2</sup>, and H.K. Xie<sup>1</sup>  
*<sup>1</sup>University of Florida, USA and <sup>2</sup>Southeast University, CHINA*

09:30  
C1L-A4 **INTEGRATED PIEZOMEMS ACTUATORS AND SENSORS**  
R.G. Polcawich, S. Bedair, J.S. Pulskamp, G. Smith, R. Kaul, C. Kroninger, E. Wetzel, and D. Potrepka  
*US Army Research Laboratory, USA*

09:45  
C1L-A5 **MICROMACHINED QUARTZ RESONATOR BASED HIGH PERFORMANCE THERMAL SENSORS**  
M.B. Pisani, K. Ren, P. Kao, and S. Tadigadapa  
*Pennsylvania State University, USA*

10:00  
C1L-A6 **NANOSCALED PIEZOELECTRIC ALUMINUM NITRIDE CONTOUR-MODE RESONANT SENSORS**  
G. Piazza, M. Rinaldi, and C. Zuniga  
*University of Pennsylvania, USA*

### SPECIAL SESSION C1L-B Biomimetics: Learning from Nature

08:45 *Invited*  
C1L-B1 **THE SMALL AND SMART SENSORS OF INSECT AUDITORY SYSTEMS**  
D. Robert<sup>1</sup>, N. Mhatre<sup>1</sup>, and T. McDonagh<sup>2</sup>  
*<sup>1</sup>University of Bristol, UK and <sup>2</sup>Rockefeller University, USA*

09:15  
C1L-B3 **BIOMIMETIC LATERAL-LINE SYSTEM FOR UNDERWATER VEHICLES**  
J.M. Franosch, S. Sosnowski, N. Kuhenuri Chami, K. Kühnlenz, S. Hirche, and J.L. van Hemmen  
*Technical University of Munich, GERMANY*

09:30  
C1L-B4 **LEARNING FROM CRICKETS: ARTIFICIAL HAIR-SENSOR ARRAY DEVELOPMENTS**  
G. Krijnen, T. Lammerink, and R. Wiegerink  
*MESA+, University of Twente, THE NETHERLANDS*

09:45

C1L-B5 **A CAPACITANCE-BASED WHISKER-LIKE ARTIFICIAL SENSOR FOR FLUID MOTION SENSING**  
J.B. Stocking<sup>1</sup>, W.C. Eberhardt<sup>1</sup>, Y.A. Shakhsheer<sup>1</sup>, J.R. Paulus<sup>2</sup>, M. Appleby<sup>2</sup>, B.H. and Calhoun<sup>1</sup>  
<sup>1</sup>University of Virginia, USA and <sup>2</sup>MikroSystems Inc., USA

10:00

C1L-B6 **PRINCIPLES AND APPLICATIONS OF ACTIVE TACTILE SENSING STRATEGIES IN THE RAT VIBRISAL SYSTEM**  
R.B. Towal, B.W. Quist, J.H. Solomon, and M.J.Z. Hartmann  
Northwestern University, USA

## **SESSION C1L-C Nanofabrication and Nanosensing**

08:45

C1L-C1 **TIP-BASED CHEMICAL VAPOR DEPOSITION OF SILICON**  
M. Tabib-Azar  
University of Utah, USA

09:00

C1L-C2 **HIGH PRECISION POLYMER DEPOSITION ONTO MICROCANTILEVER SENSORS USING ELECTROHYDRODYNAMIC PRINTING**  
J. Pikul, P. Graf, S. Mishra, K. Barton, Y. Kim, J. Rogers, A. Alleyne, P. Ferreira, and W. King  
University of Illinois, Urbana-Champaign, USA

09:15

C1L-C3 **MICROFABRICATION OF PLASMA NANOTORCH TIPS FOR LOCALIZED ETCHING AND DEPOSITION**  
Y. Xie, M. Moras, M. Tabib-Azar, and C.H. Mastrangelo  
University of Utah, USA

09:30

C1L-C4 **A DEVELOPMENT OF AUTOMATED CHEMICAL-SOLUTION-DEPOSITION MACHINE FOR MICRO ACTUATOR WITH MULTILAYERED PZT THICK FILM**  
Y. Kawai, N. Moriwaki, M. Esashi, and T. Ono  
Tohoku University, JAPAN

10:00

C1L-C5 **ENGINEERING OF BIOMIMETIC HAIR-FLOW SENSOR ARRAYS DEDICATED TO HIGH-RESOLUTION FLOW FIELD MEASUREMENTS**  
A.M.K. Dagamseh, C.M Bruinink, H. Droogendijk, R.J. Wiegerink, T.S.J. Lammerink, and G.J.M. Krijnen  
University of Twente, THE NETHERLANDS

10:15

C1L-C6 **LATE NEWS**

## **SESSION C1L-D Pressure Sensors**

08:45

C1L-D1 **A NOVEL PDMS BASED CAPACITIVE PRESSURE SENSOR**  
X. Riedl<sup>1</sup>, C. Bolzmacher<sup>1</sup>, R. Wagner<sup>1</sup>, K. Bauer<sup>1</sup>, and N. Schwesinger<sup>2</sup>  
<sup>1</sup>EADS Innovation Works, GERMANY and <sup>2</sup>Technical University Munich, GERMANY

09:00

C1L-D2 **PRESSURE SENSORS FOR PRINTED BLAST DOSIMETERS**  
J.H. Daniel<sup>1</sup>, A.C Arias<sup>1</sup>, T. Ng<sup>1</sup>, S. Garner<sup>1</sup>, J. Coleman<sup>2</sup>, J. Liu<sup>2</sup>, and R. Jackson<sup>2</sup>  
<sup>1</sup>Palo Alto Research Center (PARC), USA and <sup>2</sup>Naval Medical Center San Diego, USA

- 09:15  
C1L-D3 **EXCIMER LASER PHOTOABLATION WITH IN-SITU MASKING FOR FABRICATION OF STRETCHABLE PRESSURE SENSOR ARRAYS**  
K. Lin and K. Jain  
*University of Illinois, Urbana-Champaign, USA*
- 09:30  
C1L-D4 **ZERO OFFSET DRIFT SUPPRESSION IN SIC PRESSURE SENSORS AT 600  $\mu$ C**  
R.S Okojie<sup>1</sup>, D. Lukco<sup>2</sup>, C. Blaha<sup>3</sup>, V. Nguyen<sup>4</sup>, and E. Savrun<sup>1</sup>  
<sup>1</sup>NASA Glenn Research Center, USA, <sup>2</sup>Artic Slope Research Corp., USA, <sup>3</sup>Jacobs Engineering, USA, and <sup>4</sup>Sienna Technologies, Inc., USA
- 09:45  
C1L-D5 **SHOCK WAVE PRESSURE SENSORS ON PEN SUBSTRATE**  
N.V. Lakamraju, S.M. Venugopal, D.R. Allee, and S.M. Phillips  
*Arizona State University, USA*
- 10:00  
C1L-D6 **INTRINSIC LOW HYSTERESIS TOUCH MODE CAPACITIVE PRESSURE SENSOR**  
G. Fragiaco, T. Pedersen, O. Hansen, and E.V. Thomsen  
*Technical University of Denmark, DENMARK*

## **SESSION C1L-E Optical Biosensing**

- 08:45  
C1L-E1 **DEVELOPMENT OF OPTICAL SENSOR FOR NONINVASIVE FUNCTIONAL IMAGING OF TISSUE ABNORMALITIES**  
K. Larin<sup>1</sup>, M. Ghosn<sup>2</sup>, V.V. Tuchin<sup>3</sup>, and J. Morrisett<sup>2</sup>  
<sup>1</sup>University of Houston, USA, <sup>2</sup>Baylor College of Medicine, USA, and <sup>3</sup>Saratov State University, RUSSIA
- 09:00  
C1L-E2 **MULTI-COLOR FLUORESCENCE ENHANCEMENT FROM A PHOTONIC CRYSTAL SURFACE**  
A. Pokhriyal<sup>1</sup>, M. Lu<sup>2</sup>, C.S. Huang<sup>1</sup>, S. Schulz<sup>2</sup>, and B. Cunningham<sup>1</sup>  
<sup>1</sup>University of Illinois, Urbana-Champaign, USA and <sup>2</sup>SRU Biosystems, USA
- 09:15  
C1L-E3 **A MICROFLUIDIC PLATFORM FOR OPTICAL ABSORBANCE EVALUATION OF BACTERIAL BIOFILMS**  
M.T. Meyer, V. Roy, W.E. Bentley, and R. Ghodssi  
*University of Maryland, USA*
- 09:30  
C1L-E4 **HIGHLY SENSITIVE SURFACE-ENHANCED RAMAN NANO-PROBING FOR DIRECT PROTEOMIC PROFILING**  
Y.I. Chen<sup>1</sup>, Z. Xu<sup>1</sup>, J.P. Coppé<sup>2</sup>, and L. Liu<sup>1</sup>  
<sup>1</sup>University of Illinois, Urbana-Champaign, USA, and <sup>2</sup>Lawrence Berkeley National Laboratory, USA
- 09:45  
C1L-E5 **REDUCTION OF SIGNAL INTERFERENCE BETWEEN PH AND OPTICAL OUTPUTS IN A MULTIMODAL BIO-IMAGE SENSOR**  
H. Nakazawa, M. Ishida, and K. Sawada  
*Toyohashi University of Technology, JAPAN*

10:00

C1L-E6

**HIGH-SENSITIVITY BIOSENSING USING NANOLASER**

S. Kita<sup>1,2</sup>, S. Hachuda<sup>1,2</sup>, T. Endo<sup>3</sup>, Y. Nishijima<sup>4</sup>, H. Misawa<sup>4</sup>, and T. Baba<sup>1,2</sup>

<sup>1</sup>*Yokohamanational University, JAPAN*, <sup>2</sup>*Japan Science and Technology Agency (JST), JAPAN*,

<sup>3</sup>*Tokyo Institute of Technology, JAPAN*, and <sup>4</sup>*Hokkaido University, JAPAN*

10:15

**Mini Break**

**SESSION C2L-A Strain Sensors and Structural Monitoring**

10:45

C2L-A1

**SAW SENSOR FOR FASTENER FAILURE DETECTION**

W. Wilson<sup>1</sup>, M. Rogge<sup>1</sup>, B. Fisher<sup>2</sup>, M. Roller<sup>2</sup>, D. Malocha<sup>2</sup>, and G. Atkinson<sup>3</sup>

<sup>1</sup>*NASA Langley Research Center, USA*, <sup>2</sup>*University of Central Florida, USA*, and

<sup>3</sup>*Virginia Commonwealth University, USA*

11:00

C2L-A2

**MEMS OPTICAL ACOUSTIC SENSORS FOR STRUCTURAL HEALTH MONITORING**

Y. Zhang, J. Tsai, G.P. Li, M.Q. Feng, and M. Bachman

*University of California, Irvine, USA*

11:15

C2L-A3

**HIGH RESOLUTION NEUTRON COUNTING SENSORS IN STRAIN MAPPING THROUGH A TRANSMISSION BRAGG EDGE DIFFRACTION**

J.B. McPhate<sup>1</sup>, W. Kockelmann<sup>2</sup>, A. Steuwer<sup>3</sup>, J.V. Vallerga<sup>1</sup>, O.H.W. Siegmund<sup>1</sup>, and W.B. Feller<sup>4</sup>

<sup>1</sup>*University of California, Berkeley, USA*, <sup>2</sup>*Rutherford Appleton Laboratory, UK*,

<sup>3</sup>*ESS Scandinavia, SWEDEN*, and <sup>4</sup>*Nova Scientific, USA*

11:30

C2L-A4

**INTEGRATION OF THIN-FILM ZNO STRAIN SENSORS INTO HARD DISK DRIVES**

S. Felix, J. Nie, and R. Horowitz

*University of California, Berkeley, USA*

11:45

C2L-A5

**SHIMMER: A WIRELESS HARVESTING EMBEDDED SYSTEM FOR ACTIVE ULTRASONIC STRUCTURAL HEALTH MONITORING**

D. Dondi, A. Di Pompeo, C. Tenti, and T. Simunic Rosing

*University of California, San Diego, USA*

12:00

C2L-A6

**STIFFNESS READOUT IN MUSCULO-SKELETAL HUMANOID ROBOT BY USING ROTARY POTENTIOMETER**

M. Osada, N. Ito, Y. Nakanishi, and M. Inaba

*University of Tokyo, JAPAN*

**SPECIAL SESSION C2L-B Neuro-Sensors**

10:45

C2L-B1

*Invited*

**NANOTECHNOLOGY BASED POINT-OF-CARE DIAGNOSTICS AND THERAPEUTICS FOR NEUROLOGICAL AND CARDIOVASCULAR DISORDERS**

V. Varadan

*University of Arkansas, USA*

11:15  
C2L-B3 **INTRA-OPERATIVE CHEMICAL DIAGNOSTICS IN THE BRAIN USING ENZYME-BASED CERAMIC MICROELECTRODE ARRAYS**  
G.A. Gerhardt, P. Huettl, F. Pomerleau, J. Quintero, and J. Burmeister  
*University of Kentucky Medical Center, USA*

11:30  
C2L-B4 **DEVELOPMENT OF THREE DIMENSIONAL NEURAL SENSING DEVICE BY STACKING METHOD**  
J.C. Chiou, and C.W. Chang  
*National Chiao Tung University, TAIWAN*

11:45  
C2L-B5 **AN INTEGRATED FLEXIBLE IMPLANTABLE L-GLUTAMATE SENSOR**  
H. Cao, Y.B. Peng, and J.C. Chiao  
*University of Texas, Arlington, USA*

12:00  
C2L-B6 **SILICON-WAFER BASED ELECTROENZYMATIC GLUTAMATE BIOSENSORS FOR THE NEAR-REAL TIME MONITORING OF GLUTAMATE IN FREELY-BEHAVING RATS**  
K.W. Wassum, V.M. Tolosa, T.-C. Tseng, H.G. Monbouquette, and N.T. Maidment  
*Univeristy of California, Los Angeles, USA*

## **SESSION C2L-C Thermal Sensing**

10:45  
C2L-C1 **SIX-FOLD IMPROVEMENT IN NANOTOPOGRAPHY SENSING VIA TEMPERATURE CONTROL OF A HEATED ATOMIC FORCE MICROSCOPE CANTILEVER**  
S. Somnath, E. Corbin, and W. King  
*University of Illinois, Urbana-Champaign, USA*

11:00  
C2L-C2 **VANADIUM OXIDE THERMAL MICROPROBES FOR NANOCALORIMETRY**  
D. De Bruyker, M. Recht, F. Torres, A. Bell, and R. Bruce  
*Palo Alto Research Center (PARC), USA*

11:15  
C2L-C3 **RFID TAG ANTENNA BASED TEMPERATURE SENSING USING SHAPE MEMORY POLYMER ACTUATION**  
R. Bhattacharyya, C. Di Leo, C. Floerkemeier, S. Sarma, L. Anand  
*Massachusetts Institute of Technology, USA*

11:30  
C2L-C4 **A TEMPERATURE SENSOR FROM SELF-ASSEMBLED CARBON NANOTUBE MICROBRIDGES**  
M.F.L. De Volder<sup>1</sup>, S. Tawfick<sup>2</sup>, D. Reynaerts<sup>3</sup>, C. Van Hoof<sup>4</sup>, and A.J. Hart<sup>2</sup>  
<sup>1</sup>*Katholieke Universiteit Leuven, BELGIUM*, <sup>2</sup>*University of Michigan, USA*,  
<sup>3</sup>*Katholieke Universiteit Leuven, BELGIUM*, and <sup>4</sup>*IMEC, BELGIUM*

11:45  
C2L-C5 **ELECTRICAL NOISE CHARACTERISTICS OF A DOPED SILICON MICROCANTILEVER HEATER-THERMOMETER**  
E. Corbin and W. King  
*University of Illinois, Urbana-Champaign, USA*

12:00

C2L-C6 **PERFORMANCE OF A THERMAL MANAGEMENT SYSTEM FOR THERMOPHORESIS BASED SOOT SENSORS: DESIGN, PERFORMANCE AND VERIFICATION**

A. Larsson<sup>1</sup>, O. Storstrom<sup>1</sup>, T.A. Tollefsen Seip<sup>1</sup>, M. Hjelstuen<sup>1</sup>, R. Bjorklund<sup>2</sup>, A. Grant<sup>3</sup>, P.E. Fägerman<sup>4</sup>, J. Paaso<sup>5</sup>, and A. Lloyd Spetz<sup>2</sup>

<sup>1</sup>SINTEF ICT, NORWAY, <sup>2</sup>Linköping University, SWEDEN, <sup>3</sup>Volvo Technologies Corp., SWEDEN,

<sup>4</sup>Mandalon Technologies, SWEDEN, and <sup>5</sup>Selmic Oy, FINLAND

**SESSION C2L-D IR and Magnetic Sensing**

10:45

C2L-D1 **UNCOOLED IR SENSORS WITH TUNABLE MEMS FABRY-PÉROT FILTERS FOR THE LONG-WAVE INFRARED RANGE**

N. Neumann<sup>1</sup>, M. Ebermann<sup>1</sup>, E. Gittler<sup>2</sup>, M. Meinig<sup>3</sup>, S. Kurth<sup>3</sup>, and K. Hiller<sup>4</sup>

<sup>1</sup>InfraTec GmbH, GERMANY, <sup>2</sup>Jenoptik LOS GmbH, GERMANY, <sup>3</sup>Fraunhofer ENAS, GERMANY, and

<sup>4</sup>University of Technology, Chemnitz, GERMANY

11:00

C2L-D2 **COMPARISON OF THE PHOTONIC RESPONSES BETWEEN HORIZONTALLY ALIGNED AND NETWORK CARBON NANOTUBES**

Y. Zhou, T. Li, X. Gao, and Y. Wang

Chinese Academy of Science, CHINA

11:15

C2L-D3 **SWARM ABSOLUTE SCALAR MAGNETOMETER ACCURACY: ANALYSES AND MEASUREMENT RESULTS**

J.-M. Leger<sup>1</sup>, F. Bertrand<sup>1</sup>, T. Jager<sup>1</sup>, I. Fratter<sup>2</sup>, and J.-C. Lalaurie<sup>2</sup>

<sup>1</sup>CEA-LETI, FRANCE, and <sup>2</sup>CNES, FRANCE

11:30

C2L-D4 **DEVELOPMENT AND SPACE QUALIFICATION OF THE SWARM ABSOLUTE SCALAR MAGNETOMETER**

I. Fratter<sup>1</sup>, J.M. Leger<sup>2</sup>, F. Bertrand<sup>2</sup>, T. Jager<sup>2</sup>, M. Le Prado<sup>2</sup>, and W. Fourcault<sup>2</sup>

<sup>1</sup>Centre National d'Etudes Spatiales, FRANCE and <sup>2</sup>CEA-LETI, FRANCE

11:45

C2L-D5 **BACKSCATTER CHANNEL MEASUREMENTS AT 5.8 GHZ ACROSS HIGH-VOLTAGE CORONA**

C.R. Valenta<sup>1</sup>, P.A. Graf<sup>1</sup>, M.S. Trotter<sup>1</sup>, G.A. Koo<sup>1</sup>, G.D. Durgin<sup>1</sup>, and B.J. Schafer<sup>2</sup>

<sup>1</sup>Georgia Institute of Technology, USA and <sup>2</sup>Southern States, LLC, USA

12:00

C2L-D6 **LATE NEWS**

**SESSION C2L-E Acoustic and Optical Sensing Systems**

10:45

C2L-E1 **INTEGRATED MICRO LASER DOPPLER VELOCIMETER WITH 3-D STRUCTURE**

E. Higurashi<sup>1</sup>, T. Suga<sup>1</sup>, and R. Sawada<sup>2</sup>

<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kyushu University, JAPAN

11:00

C2L-E2 **TOF RANGE FINDING SENSOR IN 90NM CMOS CAPABLE OF SUPPRESSING 180 KLX AMBIENT LIGHT**

M. Davidovic, G. Zach, K. Schneider-Hornstein, and H. Zimmermann

Vienna University of Technology, AUSTRIA

11:15  
C2L-E3 **AN ULTRASONIC RANGEFINDER BASED ON AN ALN PIEZOELECTRIC MICROMACHINED ULTRASOUND TRANSDUCER**  
R.J. Przybyla<sup>1</sup>, S.E. Shelton<sup>2</sup>, A. Guedes<sup>2</sup>, I.I. Izyumin<sup>1</sup>, M.H. Kline<sup>1</sup>, D.A. Horsley<sup>2</sup>, and B.E. Boser<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, USA and <sup>2</sup>University of California, Davis, USA

11:30  
C2L-E4 **MEMS DIRECTIONAL SOUND SENSOR WITH SIMULTANEOUS DETECTION OF TWO FREQUENCY BANDS**  
M. Touse, J. Sinibaldi, and G. Karunasiri  
US Naval Postgraduate School, USA

11:45  
C2L-E5 **TOWARDS HIGH FIDELITY HIGH EFFICIENCY MEMS MICROSPEAKERS**  
I. Shahosseini<sup>1</sup>, E. Lefeuvre<sup>1</sup>, M. Woytasik<sup>1</sup>, J. Moulin<sup>1</sup>, G. Lemarquand<sup>2</sup>, X. Leroux<sup>1</sup>, S. Edmond<sup>1</sup>,  
E. Dufour-Gergam<sup>1</sup> and A. Bosseboeuf<sup>1</sup>  
<sup>1</sup>University of Paris Sud, FRANCE and <sup>2</sup>University of Maine, FRANCE

12:00  
C2L-E6 **CONSTRUCTION OF ILLUMINANCE DISTRIBUTION MEASUREMENT SYSTEM AND EVALUATION OF ILLUMINANCE CONVERGENCE IN INTELLIGENT LIGHTING SYSTEM**  
M. Miki, Y. Kasahara, T. Hiroyasu, and M. Yoshimi  
Doshisha University, JAPAN

12:15 **Lunch**

### **SESSION C3L-A Physical Sensors**

13:15  
C3L-A1 **MEMS PARTICULATE MATTER (PM) MONITOR FOR CELLULAR DEPLOYMENT**  
I. Paprotny, F. Doering, and R.M. White  
University of California, Berkeley, USA

13:30  
C3L-A2 **MICROCHANNEL-BASED SIZE DETECTOR FOR AIRBORNE PARTICLES**  
A. Schaap, W.C. Chu, and B. Stoeber  
University of British Columbia, CANADA

13:45  
C3L-A3 **A MEMS DEVICE WITH SUB-NANOMETER DISPLACEMENT SENSING USING CARBON NANOTUBES**  
A. Ya'akovovitz, S. Krylov, and Y. Hanein  
Tel Aviv University, ISRAEL

14:00  
C3L-A4 **TWO-AXIS MICRO-TENSILE TESTER CHIP FOR MEASURING PLANT CELL MECHANICS**  
S. Muntwyler, B.E. Kratochvil, F. Beyeler, and B.J. Nelson  
ETH Zurich, SWITZERLAND

14:15  
C3L-A5 **A THERMAL FLOW SENSOR WITH LIQUID CHARACTERIZATION FEATURE**  
A.S. Cubukcu, U. Buerklin, and G.A. Urban  
University of Freiburg - IMTEK, GERMANY

14:30

C3L-A6 **MINIATURIZED THERMAL FLOW SENSORS WITH THROUGH SILICON VIAS FOR FLIP-CHIP PACKAGING**

C. Sosna<sup>1</sup>, R. Buchner<sup>2</sup>, M. Kropp<sup>1</sup>, and W. Lang<sup>1</sup>

<sup>1</sup>University of Bremen, GERMANY and <sup>2</sup>Danfoss IXA A/S, DENMARK

**SESSION C3L-B Biomedical Applications**

13:15

C3L-B1 **DESIGN AND CHARACTERIZATION OF MICROELECTRODE ARRAYS AND SIGNAL CONDITIONING MICROCHIPS FOR HIGH SPATIAL RESOLUTION SURFACE LAPLACIAN MEASUREMENT**

H. Dong<sup>1</sup>, D.J. Jackson<sup>1</sup>, T.J. Roussel<sup>1</sup>, D.J. Dosdal<sup>2</sup>, R.E. Ideker<sup>2</sup>, J.F. Naber<sup>1</sup>, S.C. Koenig<sup>1</sup>, and R.S. Keynton<sup>1</sup>

<sup>1</sup>University of Louisville, USA, and <sup>2</sup>University of Alabama, Birmingham, USA

13:30

C3L-B2 **MICRO-POWER IMPLANTABLE TELEMETRY DEVICE FOR THE STUDY OF MICRO-PACKAGE TECHNOLOGY FOR CHRONIC BIOMEDICAL MICRO-SYSTEMS**

R. Zhang<sup>1</sup>, P. Cong<sup>2</sup>, H.-I. Kuo<sup>1</sup>, and W.H. Ko<sup>1</sup>

<sup>1</sup>Case Western Reserve University, USA and <sup>2</sup>Metronics Inc., CHINA

13:45

C3L-B3 **A NEW GENERATION OF A REGULATED MICROPUMP FOR MEDICAL APPLICATIONS**

O. Woitschach<sup>1</sup>, C. Sosna<sup>1</sup>, J. Uckelmann<sup>2</sup>, and W. Lang<sup>1</sup>

<sup>1</sup>University of Bremen, GERMANY and <sup>2</sup>Bartels Mikrotechnik GmbH, GERMANY

14:00

C3L-B4 **MICROFABRICATED CALIBRATION TOOL FOR DIRECT SHEAR STIFFNESS MEASUREMENTS WITH APPLICATIONS IN CELL MECHANICS**

G.C. Higgs, C.S. Simmons, A.T. Fried, and B.L. Pruitt

Stanford University, USA

14:15

C3L-B5 **REAL-TIME TAGLESS MONITORING OF CELL VIABILITY USING PATCH-CLAMP MICRODEVICES**

P. Pathak<sup>1</sup>, H. Zhao<sup>2</sup>, Z. Gong<sup>1</sup>, F. Nie<sup>2</sup>, T. Zhang<sup>1</sup>, S. Wong<sup>2</sup>, and L. Que<sup>1</sup>

<sup>1</sup>Louisiana Technical University, USA and <sup>2</sup>Methodist Hospital Research Institute, USA

14:30

C3L-B6 **A MICROFLUIDIC ELECTROCHEMICAL SENSOR ARRAY FOR CHARACTERIZING PROTEIN INTERACTIONS WITH VARIOUS SURFACE CHEMISTRIES**

P.H. Dykstra, V. Roy, W.E. Bentley, and R. Ghodssi

University of Maryland, USA

**SESSION C3L-C Preconcentrators and Thermal Flow Systems**

13:15

C3L-C1 **MICRO PRECONCENTRATOR FOR HANDHELD DIAGNOSTICS OF CANCER BIOMARKERS IN BREATH**

B. Alfeeli and M. Agah

Virginia Polytechnic Institute and State University, USA

13:30

C3L-C2 **LOW LEVEL ETHYLENE DETECTION USING PRECONCENTRATOR/SENSOR COMBINATIONS**

A. Sklorz<sup>1</sup>, N. Miyashita<sup>2</sup>, A. Schäfer<sup>1</sup>, and W. Lang<sup>1</sup>

<sup>1</sup>University of Bremen, GERMANY and

<sup>2</sup>FWBI Friedrich-Wilhelm-Bessel-Forschungsgesellschaft mbH, GERMANY

- 13:45  
C3L-C3 **EVALUATION OF ADSORPTION CAPACITY OF SINGLE-WALLED CARBON NANOTUBES FOR APPLICATION TO MICRO GAS PRECONCENTRATORS**  
S. Takada<sup>1</sup>, T. Nakai<sup>1</sup>, T. Thurakitse<sup>1</sup>, J. Shiomi<sup>1</sup>, S. Maruyama<sup>1</sup>, H. Takagi<sup>2</sup>, M. Shuzo<sup>1</sup>, J.-J. Delaunay<sup>1</sup>, and I. Yamada<sup>1</sup>  
<sup>1</sup>*University of Tokyo, JAPAN and*  
<sup>2</sup>*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*
- 14:00  
C3L-C4 **THERMOSTATED MICRO GAS CHROMATOGRAPHY COLUMN WITH ON-CHIP THERMAL CONDUCTIVITY DETECTOR FOR ELEVATED TEMPERATURE SEPARATION**  
S.N. Sreedharan Nair, B. Alfeeli, and M. Agah  
*Virginia Polytechnic Institute and State University, USA*
- 14:15  
C3L-C5 **A NOVEL  $\mu$ THERMAL CONDUCTIVITY DETECTOR CAPABLE OF FLOW RATE MEASUREMENT**  
B.C. Kaanta<sup>1</sup>, H. Chen<sup>2</sup>, and X. Zhang<sup>1</sup>  
<sup>1</sup>*Boston University, USA and* <sup>2</sup>*Schlumberger Doll Research, USA*
- 14:30  
C3L-C6 **COATING DIAGNOSTICS FOR THERMAL MASS FLOWMETERS**  
D. Pape, K. Hencken, D. Schrag, A. Kramer, S.I. Ott, and A. Bärlocher  
*ABB Switzerland Ltd., SWITZERLAND*

## **SESSION C3L-D N/MEMS Material Properties**

- 13:15  
C3L-D1 **MULTI-SENSOR DISTURBANCE FORCE MEASUREMENT FOR COMPLIANT MECHANICAL STRUCTURES**  
B. Denkena and F.L. Hackeloer  
*IFW Leibniz Universitaet Hannover, GERMANY*
- 13:30  
C3L-D2 **SIMULATIONS, ANALYSIS AND CHARACTERIZATION OF THE DEVELOPMENT PROFILES FOR THE THICK SU-8 UV LITHOGRAPHY PROCESS**  
Z.F. Zhou, Q.A. Huang, W.H. Li, and Z. Zhu  
*Southeast University, CHINA*
- 13:45  
C3L-D3 **CONFIRMATION ON THE SIZE-DEPENDENCE OF YOUNG'S MODULUS OF SINGLE CRYSTAL SILICON FROM THE TEM TENSILE TESTS**  
Q. Jin, T. Li, Y. Wang, X. Gao, and F. Xu  
*Chinese Academy of Sciences, CHINA*
- 14:00  
C3L-D4 **MECHANISM OF MECHANICAL DETERIORATION IN SILICON MICROcantilever INDUCED BY PLASMA PROCESS**  
M. Tomura<sup>1</sup>, C.-H. Huang<sup>1</sup>, Y. Yoshida<sup>1</sup>, T. Ono<sup>1</sup>, S. Yamasaki<sup>2</sup>, and S. Samukawa<sup>1</sup>  
<sup>1</sup>*Tohoku University, JAPAN and* <sup>2</sup>*National Institute of Advanced Industrial Science and Technology, JAPAN*
- 14:15  
C3L-D5 **AN ELECTRICAL PROBE FOR MEASURING THERMAL EXPANSION COEFFICIENTS OF MICROMACHINED POLYSILICON THIN FILMS**  
H. Liu, Q.A. Huang, and W. Li  
*Southeast University, CHINA*

14:30  
C3L-D6 **LATE NEWS**

14:45 **Break**

### **SESSION C4L-A Stress Sensing**

15:15  
C4L-A1 **IN-SITU MEASUREMENT OF CURVATURE AND MECHANICAL STRESS OF SILICON DIE IN PLASTIC ENCAPSULATED PACKAGE**  
H. Husstedt<sup>1</sup>, U. Ausserlechner<sup>2</sup>, and M. Kaltenbacher<sup>1</sup>  
*<sup>1</sup>Alps-Adriatic University Klagenfurt, AUSTRIA and <sup>2</sup>Infineon Technologies Austria AG, AUSTRIA*

15:30  
C4L-A2 **CAPACITIVE SENSING OF INTERFACIAL STRESSES**  
K. Sundara-Rajan<sup>1</sup>, A. Bestick<sup>1</sup>, G. Rowe<sup>1</sup>, A.V. Mamishev<sup>1</sup>, G. Klute<sup>2</sup>, and W. Ledoux<sup>2</sup>  
*<sup>1</sup>University of Washington, USA and <sup>2</sup>VA Puget Sound Health Care System, USA*

15:45  
C4L-A3 **STRESS DISTRIBUTION UNDER ELECTROLESS NICKEL BUMPS EXTRACTED USING 7X7 PIEZO-FET ARRAYS**  
B. Lemke<sup>1</sup>, R. Baskaran<sup>2</sup>, and O. Paul<sup>1</sup>  
*<sup>1</sup>University of Freiburg - IMTEK, GERMANY and <sup>2</sup>Intel Corporation, USA*

16:00  
C4L-A4 **MECHANICAL SENSING BASED ON FERROMAGNETIC SHAPE MEMORY ALLOYS**  
J.M. Stephan, O. Paul, and P. Ruther  
*University of Freiburg - IMTEK, GERMANY*

16:15  
C4L-A5 **A MEMS TENSILE TESTING DEVICE FOR MECHANICAL CHARACTERIZATION OF INDIVIDUAL NANOWIRES**  
Y. Zhang<sup>1</sup>, C. Ru<sup>2</sup>, X. Liu<sup>3</sup>, Y. Sun<sup>1</sup>, Y. Zhong<sup>4</sup>, X. Sun<sup>4</sup>, D. Hoyle<sup>5</sup>, and I. Cotton<sup>5</sup>  
*<sup>1</sup>University of Toronto, CANADA, <sup>2</sup>Soochow University, CHINA, <sup>3</sup>Harvard University, USA, <sup>4</sup>University of Western Ontario, CANADA, and <sup>5</sup>Hitachi High-Technologies, CANADA*

16:30  
C4L-A6 **STRAIN SENSITIVITY OF A MODIFIED SINGLE-DEFECT PHOTONIC CRYSTAL NANOCAVITY FOR MECHANICAL SENSING**  
T.T. Bui<sup>1</sup>, H.M. Nguyen<sup>2</sup>, D.V Dao<sup>1</sup>, S. Rogge<sup>2</sup>, H.W.M. Salemink<sup>2</sup>, and S. Susumu<sup>1</sup>  
*<sup>1</sup>Ritsumeikan University, JAPAN, and <sup>2</sup>Delft University of Technology, THE NETHERLANDS*

### **SESSION C3L-B Tactile and Tissue Sensing**

15:15  
C4L-B1 **DESIGN, FABRICATION AND CHARACTERIZATION OF A PIEZORESISTIVE TACTILE SENSOR FOR FINGERPRINT SENSING**  
Z.J. Zhou<sup>1</sup>, L. Rufer<sup>2</sup>, and M. Wong<sup>1</sup>  
*<sup>1</sup>Hong Kong University of Science and Technology, CHINA and <sup>2</sup>TIMA Laboratory, FRANCE*

15:30  
C4L-B2 **TACTILE EDGE DETECTION**  
C. Chorley<sup>1</sup>, C. Melhuish<sup>1</sup>, A. Pipe<sup>1</sup>, and J. Rossiter<sup>2</sup>  
*<sup>1</sup>University of the West of England, UK and <sup>2</sup>University of Bristol, UK*

15:45

C4L-B3

**A FLEXIBLE TACTILE SENSING ARRAY FOR ROBOT APPLICATIONS**

Y.T. Lai, C.L. Lin, X.H. Huang, M.Y. Cheng, and Y.J. Yang

*National Taiwan University, TAIWAN*

16:00

C4L-B4

**TOWARDS SELF-POWERING TOUCH-SENSITIVE OLED SYSTEMS**

Y. Chuo, C. Landrock, B. Omrane, J. Patel, J. Aristizabal, and B. Kaminska

*Simon Fraser University, CANADA*

16:15

C4L-B5

**A MICROSENSOR SYSTEM TO PROBE PHYSIOLOGICAL ENVIRONMENTS AND TISSUE RESPONSE**

M. Kubon<sup>1</sup>, M. Moschallski<sup>1</sup>, G. Link<sup>1</sup>, C. Burkhardt<sup>1</sup>, W. Nisch<sup>1</sup>, B. Scholz<sup>1</sup>, B. Schlosshauer<sup>1</sup>, G. Urban<sup>2</sup>, and M. Stelzle<sup>1</sup>

<sup>1</sup>*University of Tuebingen, GERMANY* and <sup>2</sup>*University of Freiburg - IMTEK, GERMANY*

16:30

C4L-B6

**HIGH-SENSITIVITY HYPER-SPECTRAL VIDEO ENDOSCOPY SYSTEM FOR INTRA-SURGERY TISSUE CLASSIFICATION**

T. Arnold, M. De Biasio, and R. Leitner

*CTR Carinthian Tech Research AG, AUSTRIA*

**SESSION C4L-C Nanostructural Chemical Sensors**

15:15

C4L-C1

**SS-DNA DECORATED SWNT GAS SENSORS INTEGRATED ON CMOS CIRCUITRY**

C.-L. Chen<sup>1</sup>, C.-F. Yang<sup>1</sup>, V. Agarwal<sup>1</sup>, S. Sonkusale<sup>2</sup>, M. Chen<sup>3</sup>, and M.R. Dokmeci<sup>1</sup>

<sup>1</sup>*Northeastern University, USA*, <sup>2</sup>*Tufts University, USA*, and <sup>3</sup>*Simmons College, USA*

15:30

C4L-C2

**POOLE-FRENKEL CONDUCTION FOR IMPROVED PERFORMANCE OF CARBON NANOTUBE CHEMIREISTORS**

A. Salehi-Khojin, K. Lin, and R. Masel

*University of Illinois, Urbana-Champaign, USA*

15:45

C4L-C3

**SENSITIVITY OF POINT DEFECTS IN ONE DIMENSIONAL NANOCIRCUITS**

S.R. Hunt, P.D. Hoang, V.R. Khalap, D. Wan, and P.G. Collins

*University of California, Irvine, USA*

16:00

C4L-C4

**VIRUS DIRECTED ASSEMBLY OF RECEPTOR PEPTIDES FOR EXPLOSIVE SENSING**

X.Z. Fan, A. Brown, K. Gerasopoulos, N.P. Siwak, J. Culver, and R. Ghodssi

*University of Maryland, USA*

16:15

C4L-C5

**NANO-STRUCTURED SERS SUBSTRATES FOR EXPLOSIVES DETECTION**

M.S. Schmidt, J.K. Olsen, J. Hübner, and A. Boisen

*Technical University of Denmark, DENMARK*

16:30

C4L-C6

**SURFACE-ENHANCED RAMAN SCATTERING NANODOMES FABRICATED BY NANOREPLICA MOLDING**

C.J. Choi, Z. Xu, H.Y. Wu, G.L. Liu, and B.T. Cunningham

*University of Illinois, Urbana-Champaign, USA*

## **SESSION C4L-D Integrated Sensors and Signal Conditioning**

15:15

**C4L-D1 CMOS-BASED HIGH-PRESSURE SENSOR USING SURFACE TRENCHES FOR SENSITIVITY ENHANCEMENT**

M. Baumann, P. Ruther, and O. Paul  
*University of Freiburg - IMTEK, GERMANY*

15:30

**C4L-D2 CMOS-INTEGRATED THREE-AXIAL FORCE SENSOR FOR COORDINATE MEASUREMENT APPLICATIONS**

M. Herrmann, P. Gieschke, P. Ruther, and O. Paul  
*University of Freiburg - IMTEK, GERMANY*

15:45

**C4L-D3 EMPLOYING COHERENT DETECTION FOR ON-CHIP SIX-AXIS POSITION SENSORS**

A. Chow, R. Ho, D. Hopkins, and D. Popovic  
*Oracle, USA*

16:00

**C4L-D4 THREE-PHASE CAPACITIVE POSITION SENSING**

R.G. Walmsley<sup>1</sup>, M.A. Hopcroft<sup>1</sup>, G.H. Corrigan<sup>2</sup>, D. Milligan<sup>2</sup>, and P.G. Hartwell<sup>1</sup>  
*<sup>1</sup>Hewlett-Packard Laboratories, USA and <sup>2</sup>Hewlett-Packard Company, USA*

16:15

**C4L-D5 RESPONSE OF PIEZOELECTRIC CIRCULAR MICRODIAPHRAGM SENSORS IN HIGHER FREQUENCY MODES**

M. Olfatnia, V.R. Singh, T. Xu, J.M. Miao, and L.S. Ong  
*Nanyang Technological University, SINGAPORE*

16:30

**C4L-D6 USE OF A SINGLE MULTIPLEXED CMOS OSCILLATOR AS DIRECT FREQUENCY READ-OUT FOR AN ARRAY OF EIGHT ALN CONTOUR-MODE NEMS RESONANT SENSORS**

M. Rinaldi, C. Zuniga, B. Duick, and G. Piazza  
*University of Pennsylvania, USA*

16:45

**End of Conference**