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SESSION CHAIR:
Venkat Bhethanabotla, University of South Florida

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Roy Olsson III^{2}, Radoslav Bogoslovov^{3}, Christal Gordon^{1}
^{1}Booz Allen Hamilton, United States; ^{2}Defense Advanced Research Projects Agency, United States;
^{3}Defense Advanced Research Projects Agency / ECS Federal, LLC, United States

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SESSION CHAIR:
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LOCATION: Poster Area

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{3}Yonsei University, Korea, South

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LOCATION: Poster Area

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^{1}George Washington University, United States; ^{2}N5 Sensors Inc, United States; ^{3}University of Maryland, United States*

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{1}Danube University Krems / Technische Universität Wien, Austria; {2}Johannes Kepler University, Austria;
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{1}IMEC, Belgium; {2}IMEC / Université Catholique de Louvain, Belgium; {3}Université Catholique de Louvain, Belgium

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A5L-C: Light Detection

LOCATION: Curacao 5-6

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{1}U.S. Naval Research Laboratory, United States; {2}University of South Carolina, United States

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{1}University of Ulster, United Kingdom; {2}Xiamen University, China

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{1}California State University, Chico, United States; {2}Eastern Washington University, United States

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{1}Columbia University, United States; {2}Technical University of Denmark, Denmark

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LOCATION: Bonaire 1-2

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^{1}National University of Singapore, Singapore; ^{2}Singapore Institute of Manufacturing Technology, Singapore

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^{1}EnLiSense LLC., United States; ^{2}University of Texas at Dallas, United States

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{1}FMC Technologies, United Kingdom; {2}Glasgow Caledonian University, United Kingdom

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{1}Tianjin University, China; {2}Yale University, United States

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LOCATION: Curacao 1-2

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{1}Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy; {2}Nazarbayev University, Russia; {3}Politecnico di Torino, Italy; {4}Università Campus Bio-Medico di Roma, Italy

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^{1}Danube University Krems / Technische Universität Wien, Austria; ^{2}Johannes Kepler University, Austria;

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{1}Complejo Hospitalario de Navarra, Spain; {2}Universidad Pública de Navarra, Spain

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Yu-Lung Sung, Fusheng Zhao, Jingting Li, Wei-Chuan Shih

University of Houston, United States

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^{1}California State Polytechnic University, Pomona, United States; ^{2}California State University, San Bernardino, United States

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^{1}Niigata University, Japan; ^{2}Osaka University, Japan; ^{3}Ritsumeikan University, Japan

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^{1}Eidgenössische Technische Hochschule Zürich / Università di Bologna, Switzerland; ^{2}Università degli Studi di Trento, Italy; ^{3}Università di Bologna, Italy

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{1}Ann Arbor VA Medical Center, United States; {2}Cleveland VA Medical Center, United States

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V. S. C. Weragoda{2}, A. Mitani{1}

{1}Sapporo City University, Japan; {2}University of Moratuwa , Sri Lanka

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Universität Bremen, Germany

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{1}ams AG, Austria; {2}EV Group, Austria; {3}Institute for Electron Microscopy and Nanoanalysis, Austria; {4}Materials Center Leoben Forschung GmbH, Austria

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{1}North Dakota State University, United States; {2}University of Washington, United States

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{1}Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy; {2}Technische Universiteit Delft, Netherlands

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LOCATION: Poster Area

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{1}Ohio State University, United States; {2}Tech4Imaging LLC, United States*

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{1}China Academy of Engineering Physics, China; {2}Southeast University, China; {3}University of Electronic Technology and Science of China, China; {4}University of Nebraska-Lincoln, United States*

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{1}Landauer, Inc., United States; {2}Purdue University, United States*

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{1}Ohio State University, United States; {2}Tech4Imaging LLC, United States*

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LOCATION: Poster Area

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Mehdi Javanmard, Rutgers University

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{1}Chinese Academy of Sciences, China; {2}Jiangsu R&D Center for Internet of Things, China; {3}National Key
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^{1}Massachusetts Institute of Technology, United States; ^{2}Singapore University of Technology and Design, Singapore; ^{3}Texas A&M University, United States; ^{4}University of Central Florida, United States

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{1}CTR Carinthian Tech Research AG, Austria; {2}Philips Consumer Lifestyle, Austria; {3}Universität Ulm,
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{1}Centro de Pesquisa e Desenvolvimento em Telecomunicações, Brazil; {2}Petróleo Brasileiro S.A., Brazil

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{1}Fujikin Inc., Japan; {2}Tohoku University, Japan

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SESSION CHAIR:
Eugene Hwang, Analog Devices

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1:00 PM - 3:00 PM

B3P-O: Sensor Applications I

LOCATION: Poster Area

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Gijs Krijnen, University of Twente

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{1}Johannes Kepler University, Austria; {2}voestalpine Stahl GmbH, Austria

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{1}Saxion University of Applied Science, Netherlands; {2}Universiteit Twente, Netherlands

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University of North Carolina at Charlotte, United States

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SESSION CHAIR:
Gijs Krijnen, University of Twente

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Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier / Université de Mont, France

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{1}Hochschule Mittweida, Germany; {2}Universität der Bundeswehr München, Germany

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{1}Faserinstitut Bremen e.V., Germany; {2}Friedrich-Wilhelm-Bessel-Institut Forschungsgesellschaft mbH, Germany; {3}Universität Bremen, Germany

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{1}Ames Research Center, United States; {2}University of California, Santa Cruz, United States

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LOCATION: Poster Area
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Rong Zhu, Tsinghua University

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{1}Wayne State University, United States; {2}Wayne State University, United States

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University of Maryland, Baltimore County , United States

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B3P-R: Biomedical Interfaces
LOCATION: Poster Area
SESSION CHAIR:
Darrin Young, University of Utah

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{1}New York Institute of Technology, United States; {2}Pennsylvania State University, United States

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Lei Dong{2}, Li-Feng Wang{1}, Qing-An Huang{2}
{1}Key Laboratory of MEMS of the Ministry of Education, Southeast University, China; {2}Southeast University, China

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Jun-Rui Zhang{1}, Adrian Ionescu{1}, Marco Mazza{2}
{1}Ecole Polytechnique Fédérale de Lausanne, Switzerland; {2}University of Applied Science – Western Switzerland, Switzerland

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{1}Chinese Academy of Sciences, China; {2}Chinese Academy of Sciences / University of Chinese Academy of Sciences, China; {3}University of Chinese Academy of Sciences, China

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Georgia Institute of Technology, United States

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LOCATION: Poster Area
SESSION CHAIR:
Francesco Orfei, University of Perugia

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Chongqing University, China

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Hua Yu, Han Wu
Chongqing University, China

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Università degli Studi di Perugia, Italy

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University of Exeter, United Kingdom

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Huan Hu, Subhanshu Gupta, Martin Schiavenato
Washington State University, United States

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1051

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

3:30 PM - 5:00 PM

B4L-A: Physical Sensors II: Crystalline & CMOS Sensors

LOCATION: Curacao 1-2

SESSION CHAIRS:

Hua Wang, Georgia Institute of Technology

Vikrant Gokhale, University of Michigan

3:30

INVITED: SIMULATION-BASED CHARACTERIZATION OF PIEZOCERAMIC MATERIALS.....1054

Stefan Rupitsch

Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

4:00

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Christian-Albrechts-Universität zu Kiel, Germany

4:15

CHARACTERIZATION OF BIPOLAR TRANSISTORS FOR CRYOGENIC TEMPERATURE SENSORS IN STANDARD CMOS1060

Lin Song, Harald Homulle, Edoardo Charbon, Fabio Sebastiano

Technische Universiteit Delft, Netherlands

4:30

E-SKIN MODULE WITH HETEROGENEOUSLY INTEGRATED GRAPHENE TOUCH SENSORS AND CMOS CIRCUITRY1063

Hadi Heidari, Carlos García Núñez, Ravinder Dahiya

University of Glasgow, United Kingdom

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Eidgenössische Technische Hochschule Zürich, Switzerland

3:30 PM - 5:00 PM

B4L-B: Ultrasound Sensors

LOCATION: Curacao 3-4

SESSION CHAIRS:

Matteo Rinaldi, Northeastern University

Songbin Gong, UIUC

3:30

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*Raffaele Guida, Enrico Santagati, Tommaso Melodia
Northeastern University, United States*

4:00

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*Hamid Basaeri, David Christensen, Shad Roundy, Yuechuan Yu, Tram Nguyen, Prashant Tathireddy, Darrin Young
University of Utah, United States*

4:15

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*Ghita Zaz{2}, Emmanuel Le Clézio{2}, Meriem Chrifi Alaoui{2}, Gilles Despaux{2}, Yoann Calzavara{1}
{1}Institut Laue-Langevin, France; {2}Université de Montpellier, France*

4:30

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*Ralf Bauer{3}, Yansheng Zhang{3}, Joseph Jackson{3}, William Whitmer{1}, William Brimijoin{2}, Michael Akeroyd{2}, Deepak Uttamchandani{3}, James Windmill{3}
{1}MRC Institute of Hearing Resarch, United Kingdom; {2}MRC Institute of Hearing Research, United Kingdom;
{3}University of Strathclyde, United Kingdom*

4:45

IMPROVING EFFICIENCY OF ULTRASONIC DISTANCE SENSORS USING PULSE INTERVAL MODULATION1081

*Seungin Shin, Min-Hyun Kim, Seibum Choi
Korea Advanced Institute of Science and Technology, Korea, South*

3:30 PM - 5:00 PM

B4L-C: Optical Physical Sensors I

LOCATION: Curacao 5-6

SESSION CHAIRS:

Reza Ghodssi, University of Maryland

Long Que, Iowa State University

3:30

FIBER LASER SENSOR FOR SIMULTANEOUS ACCELERATION AND MAGNETIC MEASUREMENT1084

*Wentao Zhang, Zhaogang Wang, Wenzhu Huang, Fang Li
Chinese Academy of Sciences, China*

3:45

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*Rui Zhang, Kenneth Smith, Rahul Mhaskar
Geometrics, Inc., United States*

4:00

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*Yohan Barbarin, Alexandre Lefrançois, Frédéric Sinatti, Alexandre Bey, Matthieu Balbarie, Antoine Osmont, Jérôme Luc
Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France*

4:15

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*Jian Fang^{2}, William Shieh^{2}, Pengbai Xu^{1}
^{1}Harbin Institute of Technology, China; ^{2}University of Melbourne, Australia*

4:30

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*Kory Gray^{2}, John Muth^{2}, William Carr^{1}
^{1}New Jersey Microsystems, United States; ^{2}North Carolina State University, United States*

4:45

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*Sinead O'Keeffe^{3}, Lingxia Chen^{3}, Elfed Lewis^{3}, Mark Grattan^{2}, Alan Hounsell^{2}, Glenn Whitten^{2}, Giuseppe Schettino^{1}
^{1}National Physical Laboratory, United Kingdom; ^{2}Northern Ireland Cancer Centre, United Kingdom; ^{3}University of Limerick, Ireland*

3:30 PM - 5:00 PM

B4L-D: Medical Sensing Applications

LOCATION: Curacao 7-8

SESSION CHAIRS:

Robert Roberts, University of Hong Kong

Gerald Gerlach, Institut fuer Festkoerperelektronik, Technische Universitaet Dresden

3:30

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Salvatore Andrea Pullano^{1}, Antonino S. Fiorillo^{1}, Ifana Mahbub^{2}, Syed K. Islam^{2}, Mark S. Gaylord^{2},
Vichien Lorch^{2}

^{1}Università degli studi Magna Græcia di Catanzaro, Italy; ^{2}University of Tennessee, United States;
^{2}University of Tennessee , United States

3:45

60GHZ VITAL SIGN RADAR USING 3D-PRINTED LENS1105

Robert Ernst^{1}, Emil Nilsson^{1}, Per-Arne Viberg^{2}

^{1}Halmstad University, Sweden; ^{2}Swedish Adrenaline AB, Sweden

4:00

**A NEW CUFFLESS OPTICAL SENSOR FOR BLOOD PRESSURE MEASURING WITH
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Yung-Hua Kao, Paul Chang-Po Chao, Tse-Yi Tu, Keng-Yueh Chiang, Chin-Long Wey
National Chiao Tung University, Taiwan

4:15

A LOW-POWER MULTI-PHYSIOLOGICAL MONITORING PROCESSOR FOR STRESS DETECTION1111

Nasrin Attaran^{2}, Justin Brooks^{1}, Tinoosh Mohsenin^{2}

^{1}United States Army Research Laboratory, United States; ^{2}University of Maryland, Baltimore County , United
States

4:30

**INTRALUMINAL PRESSURE AND TEMPERATURE SENSOR AIMED AT APPLICATION TO
FLEXIBLE ENDOSCOPE OPERATION1114**

Yusaku Maeda, Kohei Maeda, Hideki Kobara, Hirohito Mori, Hidekuni Takao
Kagawa University , Japan

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Hao Xi, Meng-Chien Lu, Xiaoshi Qian, Qiming Zhang, Sebastian Rupprecht, Qing Yang
Pennsylvania State University, United States

3:00 PM - 5:00 PM

B4L-E: Focused Session: Resonators

LOCATION: Bonaire 1-2

SESSION CHAIRS:

Peter Hesketh, Georgia Institute of Technology

Oliver Brand, Georgia Institute of Technology

3:30

INVITED: SUBSTRATE-DECOUPLED 3D MICRO-SHELL RESONATORS1120

Vahid Tavassoli, Benoit Hamelin, Farrokh Ayazi

Georgia Institute of Technology, United States

4:00

PROBING ANCHOR LOSSES IN ALN-ON-SI CONTOUR MODE MEMS RESONATORS THROUGH LASER DOPPLER VIBROMETRY1123

Cheng Tu{1}, Joshua En-Yuan Lee{1}, Astrid Frank{2}, Christoph Schäffel{2}, Uwe Stehr{3}, Matthias Hein{3}

{1}City University of Hong Kong, Hong Kong; {2}Institut für Mikroelektronik- und Mechatronik-Systeme gemeinnützige GmbH, Germany; {3}Technische Universität Ilmenau, Germany

4:15

AN ALN-ON-SI RESONANT IR SENSOR ARRAY WITH A LARGE TEMPERATURE COEFFICIENT OF FREQUENCY1126

Milad Moosavifar, Azadeh Ansari, Mina Rais-Zadeh

University of Michigan, United States

4:30

MICROWAVE RESONATOR SENSOR INTEGRATED WITH NANOSTRUCTURED SEMICONDUCTOR MEMBRANES FOR PHOTODETECTION AND CARRIER LIFETIME MEASUREMENT1129

Najia Mahdi, Ryan Kisslinger, Himani Sharma, Mohammad Hossein Zarifi, Mojgan Daneshmand, Karthik Shankar

University of Alberta, Canada

4:45

ANALYSIS OF THICKNESS AND QUALITY FACTOR OF A DOUBLE PADDLE OSCILLATOR AT ROOM TEMPERATURE1132

Hamza Shakeel{1}, Thomas Metcalf{2}, Josh Pomeroy{1}

{1}National Institute of Standards and Technology, United States; {2}Naval Research Laboratory, United States

3:30 PM - 5:00 PM

B4L-F: Chemical & Gas Sensing from Fabrication to Application

LOCATION: Bonaire 3-4

SESSION CHAIRS:

Kourosh Kalantarzadeh, RMIT University

Omer Oralkan, North Carolina State University

3:30

AMPLIFIED CHEMOMECHANICAL COMB GAS SENSOR1135

*Rugved Likhite, Shashank S Pandey, Aishwaryadev Banerjee, Hanseup Kim, Carlos H Mastrangelo
University of Utah, United States*

3:45

**DEVELOPMENT OF A PRINTED IMPEDANCE BASED ELECTROCHEMICAL SENSOR ON
PAPER SUBSTRATE1138**

*Dinesh Maddipatla, Binu Narakathu, Bradley Bazuin, Massood Zandi Atashbar
Western Michigan University, United States*

4:00

ROOM TEMPERATURE SENSING OF VOCS BY ATOMIC LAYER DEPOSITION OF METAL OXIDE.....1141

*Akhilesh Tanneeru, Steven Mills, Michael Lim, Marzana Mantasha Mahmud, James Dieffenderfer, Alper Bozkurt,
Troy Nagle, Bongmook Lee, Veena Misra
North Carolina State University, United States*

4:15

**ROOM TEMPERATURE IONIC LIQUID ELECTROCHEMICAL GAS SENSOR FOR RAPID
OXYGEN DETECTION WITH TRANSIENT DOUBLE POTENTIAL AMPEROMETRY1144**

*Hao Wan, Heyu Yin, Andrew Mason
Michigan State University, United States*

4:30

**CARBON DIOXIDE SENSOR FOR MOBILE DEVICES: A NOVEL APPROACH FOR
LOW-POWER CONSUMING, HIGHLY SENSITIVE NDIR SENSORS1147**

*Louisa Scholz, Alvaro Ortiz Perez, Benedikt Bierer, Ponkanok Eaksen, Jürgen Wöllenstein, Stefan Palzer
Albert-Ludwigs-Universität Freiburg, Germany*

4:45

TOWARDS A NOVEL OPTICAL TRACE OXYGEN SENSOR FOR COMMERCIAL USE1150

*Gary McDowell^{1}, Francesca Farrow^{1}, Mahesh Uttamlal^{1}, Sheila Holmes-Smith^{1}, Craig Mitchell^{2}, Patrick
Shannon^{2}
^{1}Glasgow Caledonian University, United Kingdom; ^{2}SST Sensing Ltd, United Kingdom*

11:00 AM - 12:30 PM

C2L-A: Physical Sensors III: Magnetometers & Inertial Sensors

LOCATION: Curacao 1-2

SESSION CHAIRS:

Qing-An Huang, Southeast University

Philip Feng, Case Western Reserve University

11:00

**A FAST DETERMINATION METHOD FOR IDENTIFYING THE SPIN EXCHANGE RELAXATION
FREE REGIME OF ATOMIC MAGNETOMETER1153**

*Yanzhang Wang, Xue Zhang, Jianan Qin, Chen Chen
Jilin University, China*

11:15

**A DUAL QUANTIZATION ELECTROMECHANICAL SIGMA-DELTA MODULATOR VIBRATORY
WHEEL GYROSCOPE.....1156**

*Bin Sheng{2}, Fang Chen{1}, Chao Qian{2}, Dacheng Xu{2}, Shuwen Guo{2}, Xinxin Li{1}
{1}Shanghai Institute of Microsystem and Information Technology / Chinese Academy of Sciences, China;
{2}Soochow University, China*

11:30

**A MEMS RESONANT TILT SENSOR WITH HIGH SENSITIVITY MAINTAINED IN THE WHOLE
360° MEASUREMENT RANGE.....1159**

*Shudong Wang, Juan Ren, Tianyi Zhang, Yinsheng Weng, Zhuangde Jiang, Xueyong Wei
Xi'an Jiaotong University, China*

11:45

**A DAMPING CONSTANT MODEL FOR PROOF-MASS STRUCTURE DESIGN OF MEMS INERTIAL
SENSOR BY MULTI-LAYER METAL TECHNOLOGY1162**

*Toshifumi Konishi{1}, Teruaki Safu{1}, Katsuyuki Machida{1}, Daisuke Yamane{2}, Masato Sone{2}, Kazuya
Masu{2}, Hiroshi Toshiyoshi{3}
{1}NTT Advanced Technology Corporation, Japan; {2}Tokyo Institute of Technology, Japan; {3}University of
Tokyo, Japan*

12:00

**A LOW 1/F-NOISE ACCELEROMETER FRONTEND USING CHOPPER STABILIZATION AT A
FREQUENCY MATCHED WITH A NOTCH OF QUANTIZATION NOISE.....1165**

*Kazuo Ono, Daisuke Maeda, Takashi Oshima, Toshiaki Nakamura, Joan Giner, Tomonori Sekiguchi
Hitachi Ltd., Japan; Hitachi Ltd., Spain*

12:15

**DEVELOPMENT OF 2V SENSITIVITY STATIC ELECTRICITY SENSOR WITH VERTICALLY
MOUNTED LARGE ELECTRODE.....1168**

*Atsuya Ima, Yusaku Oka, Kyohei Terao, Fusao Shimokawa, Hidekuni Takao
Kagawa University, Japan*

11:00 AM - 12:30 PM
C2L-B: Biomedical Sensors
LOCATION: Curacao 3-4
SESSION CHAIRS:
Ryuji Yokokawa, Kyoto University
Giuseppe Barillaro, Università di Pisa

- 11:00**
INVITED: CAVITAS SENSORS AND SNIFF-CAM FOR BIOMONITORING: SOFT CONTACT LENS & MOUTHGUARD SENSORS, OPTICAL BIO-SNIFFING OF HUMAN VOCS1171
Kohji Mitsubayashi
Tokyo Medical and Dental University, Japan
- 11:30**
ELECTROCHEMICAL DETECTION OF A NOVEL THERAPEUTIC COMPOUND FOR SCHIZOPHRENIA ...1174
Tugba Kilic{1}, Sandro Carrara{1}, Valerie Brunner{2}, Laurent Audoly{2}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Laboratoires Pierre Fabre, France
- 11:45**
SELF-POWERED GLUCOSE BIOSENSOR OPERATING UNDER PHYSIOLOGICAL CONDITIONS1177
Tanmay Kulkarni, Gymama Slaughter
University of Maryland, Baltimore County, United States
- 12:00**
DETECTION OF ROTAVIRUS IN CLINICAL SPECIMENS USING AN IMMUNOSENSOR BASED ON THE PRINCIPLE OF FLUORESCENCE FLUCTUATION SPECTROSCOPY1180
Makoto Hasegawa{1}, Yuka Inoue{1}, Nanami Kimura{1}, Ernest Wandera{2}, Yoshio Ichinose{2}
{1}Nagahama Institute of Bioscience and Technology, Japan; {2}Nagasaki University, Japan
- 12:15**
STUDIES OF CELL BEHAVIORS IN 3D MICROTISSUES IN A MICROFLUIDIC DEVICE: GROWTH AND MIGRATION1183
Xiangchen Che, Shenmin Gong, Long Que, Jacob Nuhn, Ian Schneider
Iowa State University, United States

11:00 AM - 12:30 PM

C2L-C: Machine Olfaction for Environmental Monitoring

LOCATION: Curacao 5-6

SESSION CHAIRS:

Troy Nagle, North Carolina State University

Susan Schiffman, North Carolina State University

11:00

INVITED: SMART SENSORS FOR AIR QUALITY MONITORING: CONCEPTS AND NEW

DEVELOPMENTS1186

Jan Mitrovics

JLM Innovation GmbH, Germany

11:30

A NOVEL MICROPUMP DRIVER USED IN ENVIRONMENTAL SENSOR APPLICATIONS1188

Bernadette Kinzel^{1}, Detlef Bonfert^{1}, Florian Lippert^{1}, Frank Vanselow^{1}, Erkan Isa^{1}, Doris Schmitt-Landsiedel^{2}, Linus Maurer^{3}

^{1}Fraunhofer-Einrichtung für Mikrosysteme und Festkörper , Germany; ^{2}Fraunhofer-Einrichtung für Mikrosysteme und Festkörper / Technische Universität München, Germany; ^{3}Fraunhofer-Einrichtung für Mikrosysteme und Festkörper / Universität der Bundesw

11:45

A BATTERY-OPERATED WIRELESS MULTICHANNEL GAS SENSOR SYSTEM BASED ON A CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCER (CMUT) ARRAY1191

Chunkyun Seok, Marzana Mantasha Mahmud, Oluwafemi Adelegan, Xiao Zhang, Omer Oralkan

North Carolina State University, United States

12:00

DUAL CHANNEL MICROCANTILEVER HEATERS FOR SELECTIVE DETECTION AND QUANTIFICATION OF A GENERIC MIXTURE OF VOLATILE ORGANIC COMPOUNDS1194

Ifat Jahangir^{2}, Goutam Koley^{1}

^{1}Clemson University, United Kingdom; ^{2}University of South Carolina, United States

12:15

UV EXCITED SNO₂ NANOWIRE BASED PRINTED E-NOSE: POTENTIAL APPLICATION AS BURNING SMELL DETECTOR AND EXPLOSIVE DETECTOR1197

Mustahsin Adib, Martin Sommer

Karlsruher Institut für Technologie, Germany

11:00 AM - 12:30 PM

C2L-D: Electromagnetic Based Sensing Applications

LOCATION: Curacao 7-8

SESSION CHAIRS:

Gijs Krijnen, University of Twente

Cameron Riviere, The Robotics Institute, Carnegie Mellon University

11:00

PULSE INDUCTION PARKING SENSOR.....1200

Stefano Guatieri, Giovanni Badaracco, Ivan Defilippis, Diego Barrettino

University of Applied Sciences and Arts of Southern Switzerland, Switzerland

11:15

UHF RFID SENSORS BASED ON FREQUENCY MODULATION.....1203

Md. Mazidul Islam{1}, Ville Viikari{1}, Joonas Nikunen{3}, Marko Reinikainen{2}

{1}Aalto University, Finland; {2}Espotel Oy, Finland; {3}Metso Automation, Finland

11:30

NON-CONTACT MEASUREMENT OF SILICON THIN WAFER WARPAGE BY THZ TOMOGRAPHY AND LASER TRIANGULATION.....1206

Thomas Arnold, Johannes Schicker, Martin Kraft, Christina Hirschl

CTR Carinthian Tech Research AG, Austria

11:45

A BATTERY-FREE RFID SENSOR TAG WITH FIBER-OPTIC TAMPER DETECTION1209

Alexander Hoang{3}, Kip Coonley{1}, Faranak Nekoogar{2}, Matthew Reynolds{3}

{1}Duke University, United States; {2}Lawrence Livermore National Laboratory, United States; {3}University of Washington, United States

12:00

PLASMA DIAGNOSTICS IN DIELECTRIC DEPOSITION PROCESSES1212

Christian Schulz, Ilona Rolfes

Ruhr-Universität Bochum, Germany

12:15

A NEW APPROACH FOR VELOCITY PROFILE MEASUREMENTS WITH ELECTROMAGNETIC FLOW TOMOGRAPHY1215

Jan Christoph Abrolat, Thomas Musch

Ruhr-Universität Bochum, Germany

11:00 AM - 12:30 PM
C2L-E: Sensor Network, Method & Evaluation
LOCATION: Bonaire 1-2
SESSION CHAIRS:
Huseyin Ugur Yildiz, TED University
Jian Lu, AIST

- 11:00**
PRECISE SYNCHRONIZATION TIME STAMP GENERATION FOR BLUETOOTH LOW ENERGY1218
Carl Christian Rheinländer, Norbert Wehn
Technische Universität Kaiserslautern, Germany
- 11:15**
SIMULTANEOUS SENSOR LOCALIZATION VIA SYNTHETIC APERTURE RADAR (SAR) IMAGING1221
Xiaojie Fu, Andreas Pedross-Engel, Daniel Arnitz, Matthew Reynolds
University of Washington, United States
- 11:30**
**SOFTWARE-DEFINED QOS PROVISIONING FOR FOG COMPUTING ADVANCED WIRELESS
SENSOR NETWORKS.....1224**
Lina Huang{1}, Gaolei Li{1}, Jun Wu{1}, Lan Li{1}, Jianhua Li{1}, Rosario Morello{2}
{1}Shanghai Jiao Tong University, China; {2}Università degli Studi Mediterranea di Reggio Calabria, Italy
- 11:45**
**DISTRIBUTED DETECTION OF CRITICAL NODES IN WIRELESS SENSOR NETWORKS
USING CONNECTED DOMINATING SET1227**
Orhan Dagdeviren{2}, Vahid Khalilpour Akram{2}, Bulent Tavli{4}, Huseyin Ugur Yildiz{3}, Can Atilgan{1}
*{1}Dokuz Eylul University, Turkey; {2}Ege University, Turkey; {3}TED University, Turkey; {4}TOBB University of
Economics and Technology, Turkey*
- 12:00**
**POWER-AWARE CHANNEL-HOPPING MAC MECHANISMS FOR BATTERY-OPERATED
MULTI-HOP NETWORKS.....N/A**
Arvind Kandhalu, Arifon Xhafa, Ramanuja Vedantham, Xiaolin Lu
Texas Instruments Incorporated, United States
- 12:15**
**MINIATURIZATION AND PACKAGING OF IMPLANTABLE WIRELESS SENSOR NODES FOR
ANIMALS MONITORING1233**
*Jian Lu{2}, Lan Zhang{2}, Sohei Matsumoto{2}, Hiroshi Hiroshima{2}, Kouichi Serizawa{4}, Masanori Hayase{3},
Takafumi Gotoh{1}*
*{1}Kyushu University, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan;
{3}Tokyo University of Science, Japan; {4}Tokyo University of Science / National Institute of Advanced Industrial
Science and Technology, Japan*

11:00 AM - 12:30 PM

C2L-F: Focused Session: Energy Harvesting & Low-Power Sensors I

LOCATION: Bonaire 3-4

SESSION CHAIRS:

Zeynep Celik-Butler, University of Texas at Arlington

Yuji Suzuki, The University of Tokyo

11:00

INVITED: DESIGN OF METGLAS/POLYVINYLIDENE FLUORIDE MAGNETOELECTRIC LAMINATES

FOR ENERGY HARVESTING FROM POWER CORDS1236

Myung-Eun Song^{3}, Yongke Yan^{3}, Sreenivasulu Gollapudi^{3}, Mirza Bichurin^{1}, Vladimir Petrov^{1}, Mohan Sanghadasa^{2}, Shashank Priya^{3}

{1}Novgorod State University, Russia; {2}U.S. Army Research, Development and Engineering Command, United States; {3}Virginia Polytechnic Institute and State University, United States

11:30

MEMS COMB-DRIVE ELECTRET ENERGY HARVESTER CHARGED AFTER PACKAGING1239

Seonwoo Kim, Yuji Suzuki

University of Tokyo, Japan

11:45

SELF-POWERED CMOS ACTIVE RECTIFIER SUITABLE FOR LOW-VOLTAGE MECHANICAL

ENERGY HARVESTERS1242

Abdallahman Sayed Herbawi, Fabio Velarde, Oliver Paul, Tzeno Galchev

Albert-Ludwigs-Universität Freiburg, Germany

12:00

DESIGN AND OPTIMIZATION OF AN ELECTROSTATIC ENERGY SCAVENGER FOR LOW

POWER ELECTRONICS1245

Shaikh Md Rubaiyat Tousif, Donald Butler, Zeynep Çelik-Butler

University of Texas at Arlington, United States

12:15

EMBEDDED ELASTIC WAVE MIRRORS FOR ENHANCED ENERGY HARVESTINGN/A

Serife Tol, Fahad Vora, Levent Degertekin, Alper Erturk

Georgia Institute of Technology, United States

1:30 PM - 3:30 PM

C3P-G: Sensor Phenomenon, Modeling, & Evaluation III: Sensors & Applications

LOCATION: Poster Area

SESSION CHAIR:

Stefan Rupitsch, Friedrich-Alexander-Universität

C-1-2

KEY ASPECTS OF PHOTOPLETHYSMOGRAM SIGNALS FOR APPLICATION TO ALCOHOL-INTAKE DETECTION1251

Yasuhisa Omura, Hajime Ozaki

Kansai University, Japan

C-1-4

MICRONEEDLE THERMAL FLOW SENSOR.....1254

Hoon Lee{2}, Sangwoong Baek{1}, Eunyong Jeon{1}, Junghoon Lee{1}

{1}Seoul National University, Korea, South; {2}Seoul National University / Samsung Electronics Semiconductor R&D Center, Korea, South

C-1-6

DESIGN, MEASUREMENT AND EVALUATION FOR PLL APPLICATION OF A WIDEBAND MEMS PHASE DETECTOR.....1257

Juzheng Han, Xiaoping Liao

Southeast University, China

C-1-8

NOISE AND IMPEDANCE OF THE SIROF UTAH ELECTRODE ARRAY1260

Mohit Sharma, Avery Gardner, Jason Silver, Ross Walker

University of Utah, United States

C-1-10

SVR BASED DENSE AIR POLLUTION ESTIMATION MODEL USING STATIC AND WIRELESS SENSOR NETWORK1263

Ke Hu{3}, Vijay Sivaraman{3}, Hari Bhrugubanda{3}, Shiyong Kang{1}, Ashfaqur Rahman{2}

{1}Chinese University of Hong Kong, Hong Kong; {2}Commonwealth Scientific and Industrial Research Organisation, Australia; {3}University of New South Wales, Australia

C-1-12

A PRACTICAL SOLUTION FOR ACCURATE STUDIES OF NDIR GAS SENSOR PRESSURE DEPENDENCE: LAB TEST BENCH, SOFTWARE AND CALCULATION ALGORITHM1266

Bakhram Gaynullin, Maksym Bryzgalov, Christine Hummelgård, Henrik Rödjegård

SenseAir AB, Sweden

C-1-16

EXPERIMENTAL AND THEORETICAL ANALYSES OF EFFECT OF ZNO NANOWIRE GROWTH ON MECHANICAL PROPERTIES OF MICROCANTILEVERS FOR DYNAMIC SENSING APPLICATIONS.....1269

Nikhilendu Tiwary, Arindam Kushagra, Manoj Kandpal, Valipe Ramgopal Rao

Indian Institute of Technology Bombay, India

C-1-18

MODELING AND EXPERIMENTAL CHARACTERIZATION OF FLEXIBLE GRAPHENE COMPOSITE STRAIN SENSORS1272

Mohamed Serry, Mahmoud Sakr

American University in Cairo, Egypt

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MICROBIAL FUEL CELL AS A BIOSENSOR AND A POWER SOURCE FOR FLORA HEALTH MONITORING	1275
<i>Davide Brunelli, Pietro Tosato, Maurizio Rossi</i>	
<i>Università degli Studi di Trento, Italy</i>	
C-1-22	
LOW-COST AIR QUALITY MONITORS: MODELING AND CHARACTERIZATION OF SENSOR DRIFT IN OPTICAL PARTICLE COUNTERS	1278
<i>Michael Taylor</i>	
<i>Carnegie Mellon University, United States</i>	
C-1-24	
A SINGLE-CHIP ISFET BASED PH SENSOR.....	1281
<i>Mst Shawkat, Nicole McFarlane</i>	
<i>University of Tennessee , United States</i>	
C-1-26	
LD-MAC: A LOAD-DISTRIBUTED DATA TRANSMISSION IN BODY AREA NETWORK	1284
<i>Tanmoy Maitra, Paramita Mallick, Sarbani Roy</i>	
<i>Jadavpur University, India</i>	
C-1-28	
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<i>Michael Lim, Abhishek Malhotra, Steven Mills, John Muth, Bongmook Lee, Veena Misra</i>	
<i>North Carolina State University, United States</i>	
C-1-30	
FAST METHOD FOR THE CALCULATION OF SURFACE BENDING ON CIRCULAR MULTILAYERED PIEZOELECTRIC STRUCTURES	1290
<i>Thomas Voglhuber-Brunnmaier^{2}, Erwin K. Reichel^{2}, Bernhard Jakoby^{2}, Roman Beigelbeck^{1}, Patrick Mayrhofer^{3}, Ulrich Schmid^{3}</i>	
<i>^{1}Danube University Krems / Technische Universität Wien, Austria; ^{2}Johannes Kepler University, Austria; ^{3}Technische Universität Wien, Austria</i>	
1:30 PM - 3:30 PM	
C3P-H: New Materials Platforms & Nanostructures for Sensing	
LOCATION: Poster Area	
SESSION CHAIR:	
Mohammad Zarifi, University of Manitoba	
C-2-33	
CARBON NANOTUBE FOREST DEVICES WITH NEGATIVE POISSON'S RATIO	1293
<i>Assaf Ya'akovovitz</i>	
<i>Ben-Gurion University of the Negev, Israel</i>	
C-2-36	
SILK PIEZOELECTRIC THIN FILMS : MATERIALS TO DEVICES	1296
<i>Jose Joseph, Sai Yaraj Saraswathi, Anshika Agarwal, Shiv Govind Singh, Siva Rama Krishna Vanjari</i>	
<i>Indian Institute of Technology Hyderabad, India</i>	
C-2-39	
IMPROVING GAS-SENSING PERFORMANCE OF REDUCED GRAPHENE OXIDE USING POLYCRYSTALLINE SNO₂ NANOPARTICLES AS SENSITIZER.....	1299
<i>Jie Sun^{1}, Xi Yang^{1}, Guoyuan Xiao^{2}</i>	
<i>^{1}China Academy of Engineering Physics, China; ^{2}Southwest University of Science and Technology, China</i>	

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SELECTIVE DEPOSITION OF SILVER NANOWIRES AND ITS APPLICATION FOR WEARABLE PRESSURE SENSOR.....	1302
<i>Gui-Shi Liu{2}, Jing-Shen Qiu{2}, Bo-Ru Yang{2}, Han-Ping David Shieh{1}</i>	
<i>{1}National Chiao Tung University, Taiwan; {2}Sun Yat-Sen University, China</i>	
C-2-45	
STRAIN GAUGE PRINTED ON CARBON WEAVE FOR SENSING IN CARBON FIBER REINFORCED PLASTICS	1305
<i>Gerrit Dumstorff, Walter Lang</i>	
<i>Universität Bremen, Germany</i>	
C-2-48	
BIOMIMETIC HYDROGEL CUPULA FOR CANAL NEUROMASTS INSPIRED SENSORS.....	1308
<i>Meghali Bora{4}, Ajay Giri Prakash Kottapalli{4}, Mohsen Asadnia{1}, Jianmin Miao{3}, Michael S. Triantafyllou{2}</i>	
<i>{1}Macquarie University, Australia; {2}Massachusetts Institute of Technology, United States; {3}Nanyang Technological University, Singapore; {4}Singapore-MIT Alliance for Research and Technology, Singapore</i>	
C-2-58	
ZNO NANOPARTICLE-BASED OPTICAL SENSORS FABRICATED BY HIGH CURRENT DENSITY ELECTRODEPOSITION AND FLAME OXIDATION	1311
<i>Xiaochen Wang, Christopher Hughes, Sanghoon Park, Xiangmeng Ma, Hyoung Jin Cho</i>	
<i>University of Central Florida, United States</i>	
C-2-51	
FOIL-BASED STRAIN GAUGES WITH NANOGRANULAR PLATINUM STRUCTURES FOR THE INTEGRATION IN ELASTOMER GASKETS	1314
<i>Daniel Gräbner{1}, Eva-Maria Meyer{2}, Walter Lang{2}</i>	
<i>{1}FWBI Friedrich-Wilhelm-Bessel-Institut Forschungs GmbH, Germany; {2}Universität Bremen, Germany</i>	
C-2-54	
OPTIMIZATION OF METGLAS 2605SA1 AND PZT-5A MAGNETOELECTRIC LAMINATES FOR MAGNETIC SENSING APPLICATIONS	1317
<i>Eugene Freeman, Joshua Harper, Nishit Goel, Steven J. Schiff, Srinivas Tadigadapa</i>	
<i>Pennsylvania State University, United States</i>	
C-2-56	
NANOCELLULOSE ELECTRODES FOR INTERFACING PLANT ELECTROCHEMISTRY	1320
<i>Kevin Keller{1}, Michael Wilkins{1}, James Reynolds{1}, James Dieffenderfer{1}, Charles Hood{1}, Michael Daniele{1}, Alper Bozkurt{1}, Meral Tunc-Ozdemir{2}</i>	
<i>{1}North Carolina State University, United States; {2}University of North Carolina, United States</i>	

1:30 PM - 3:30 PM

C3P-J: Chemical Sensing

LOCATION: Poster Area

SESSION CHAIR: Susan Schiffman, NC State University

C-3-63

**SMARTPHONE-BASED THIN LAYER CHROMATOGRAPHY FOR THE DISCRIMINATION OF
FALSIFIED MEDICINES1323**

*Hojeong Yu{3}, Huy Le{3}, Steven Lumetta{3}, Brian T. Cunningham{3}, Eliangiringa Kaale{1}, Thomas Layloff{2}
{1}Muhimbili University of Health and Allied Sciences, Tanzania; {2}Partnership for Supply Chain Management,
Inc. / Management Sciences for Health, United States; {3}University of Illinois at Urbana–Champaign, United
States*

C-3-66

EPOXY EXPOSURE INDUCED ELECTRONIC PROPERTIES CHANGE OF GRAPHENE.....1326

*Md Ahsan Uddin{1}, Ferhat Bayram{1}, Goutam Koley{1}, Yihao Zhu{2}, Amol Singh{2}, Ifat Jahangir{2}
{1}Clemson University, United States; {2}University of South Carolina, United States*

C-3-69

**EXPERIMENTATION OF DIOXAZABOROCANE DERIVATIVE AS FLUORESCENT
MATERIAL: APPLICATION TO THE TRACE DETECTION OF HYDROGEN PEROXIDE1329**

*Celine Frenois, Thomas Caron, Eric Pasquinet, Pascal Palmas, Franck Pereira, Rodrigue Rousier
Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France*

C-3-72

**FORMATION OF ORIENTED METAL NANOSTRUCTURES BY POLARIZED LIGHT IRRADIATION
FOR OPTICAL SENSING1332**

*Masashi Watanabe, Fumihiko Sassa, Kenshi Hayashi
Kyushu University, Japan*

C-3-75

**CALIXARENE-POLY(METHYL METHACRYLATE) COMPOSITES FOR ATR-IR SENSING OF
WATER DISSOLVED AROMATIC COMPOUNDS1335**

*Charles Heath, Matthew Myers, Bobby Pejic
Commonwealth Scientific and Industrial Research Organisation, Australia*

C-3-78

DEVELOPMENT OF A FIBER-OPTIC CHEMICAL SENSOR FOR THE DETECTION OF CADMIUM.....1338

*Thu Hien Nguyen, Stephen Wren, Tong Sun, Kenneth Grattan
City University London, United Kingdom*

C-3-81

DEVELOPMENT OF A NOVEL MINIATURIZED LTCC-BASED WIRELESS PH SENSING SYSTEM1341

*Housseem Eddine Amor{1}, Ammar Kouki{1}, Paul Marsh{2}, Kyoung Tae Kim{2}, Hung Cao{2}
{1}Ecole de Technologie Supérieure, Canada; {2}University of Washington, United States*

C-3-84

GLUCOSE SENSING WITH GRAPHENE VARACTORS1344

*Yao Zhang{2}, Rui Ma{2}, Yogish Kudva{1}, Philippe Bühlmann{2}, Steven Koester{2}
{1}Mayo Clinic, United States; {2}University of Minnesota, United States*

C-3-87

SUSPENDED CHALCOGENIDE MICROCAVITIES FOR ULTRA-SENSITIVE CHEMICAL DETECTION1347

Derek Kita{1}, Hongtao Lin{1}, Junying Li{1}, Zhaohong Han{1}, Peter Su{1}, Tian Gu{1}, Anu Agarwal{1}, Anupama Yadav{2}, Kathleen Richardson{2}, Juejun Hu{1}

{1}Massachusetts Institute of Technology, United States; {2}University of Central Florida, United States

C-3-90

PARTS PER MILLION CH₄ CHEMORESISTOR SENSORS BASED ON MULTI WALL

CARBON NANOTUBES/METAL-OXIDE NANOPARTICLES1350

Michela Sainato{4}, Md Tanim Humayun{4}, Lara Gundel{2}, Paul Solomon{3}, Liliانا Stan{1}, Ralu Divan{1}, Igor Paprotny{4}

{1}Argonne National Laboratory, United States; {2}Lawrence Berkeley National Laboratory, United States; {3}United States Environmental Protection Agency, United States; {4}University of Illinois at Chicago, United States

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Siddhardha Mohan Sakhamuri, Sai Prudhvi Kumar Gummadi, Ryan Toonen, Omar Rosas Camacho

University of Akron, United States

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C3P-K: Biosensors

LOCATION: Poster Area

SESSION CHAIR:

Chung-Yu Chang

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Zhejiang University, China

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{1}Nanjing University of Science and Technology, China; {2}Nanjing University of Science and Technology / Chinese Academy of Sciences, China; {3}University of South Florida, United States

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LOCATION: Poster Area
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Vikrant Gokhale, NIST

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{1}CentraleSupélec, France; {2}Université de Lorraine, France; {3}Université Lille 1, France; {4}Université Savoie Mont Blanc, France

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{1}*Flemish Institute of Technological Development, Belgium*; {2}*University of Warwick, United Kingdom*

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Martin Doubek{2}, *Vaclav Vacek*{3}, *Gregory Hallewell*{1}, *Ben Pearson*{4}
{1}*Aix-Marseille Université, France*; {2}*Czech Technical University in Prague, Czech Rep.*; {3}*Czech Technical University in Prague / Unicom College, Czech Rep.*; {4}*University of Oklahoma, United States*

1:30 PM - 3:30 PM

C3P-M: Physical Sensors VII: Mechanical, Force, Pressure

LOCATION: Poster Area

SESSION CHAIR:

Vikrant Gokhale, NIST

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{1}*Laboratoire d'Analyse et d'Architecture des Systèmes / Université de Toulouse, France*; {2}*National Centre for Nuclear Research, Poland*; {3}*Wrocław University of Technology, Poland*

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Amphenol Advanced Sensor, United States

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{1}*Tennessee Technical University, United States*; {2}*University of South Carolina, United States*

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{1}*National Institute of Advanced Industrial Science and Technology, Japan*; {2}*NMEMS Technology Research Organization / Dai Nippon Printing, Japan*; {3}*NMEMS Technology Research Organization / National Institute of Advanced Industrial Science and Techn, Ja*

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Xi'an Jiaotong University, China

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Indian Institute of Science, India

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University of Texas at Dallas, United States

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University of Texas at Dallas, United States

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Tom Kwa
DunAn Sensing LLC, United States

1:30 PM - 3:30 PM
C3P-N: Sensor Network, Applications
LOCATION: Poster Area
SESSION CHAIR:
Ryutaro Maeda, AIST

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{1}Shanghai Institute of Microsystem and Information Technology / Chinese Academy of Sciences, China;
{2}Soochow University, China

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{1}Environment Sanitation Research Center, Japan; {2}Tottori University, Japan

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{1}ASELSAN Inc. / TOBB University of Economics and Technology, Turkey; {2}TED University, Turkey; {3}TOBB University of Economics and Technology, Turkey

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LOCATION: Poster Area
SESSION CHAIR:
Robert Roberts, University of Hong Kong

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<i>^{1}Hamad Bin Khalifa University, Qatar; ^{2}Purdue University, United States</i>	
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<i>^{1}Medical University of Bialystok, Poland; ^{2}Warsaw University of Technology, Poland</i>	
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<i>^{1}Università degli Studi di Pavia, Italy; ^{2}Università degli Studi Milano-Bicocca, Italy</i>	
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<i>^{1}Purdue University, United States; ^{2}Universidad Tecnológica de Querétaro / Purdue University, Mexico</i>	
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<i>University of Nebraska-Lincoln, United States</i>	

1:30 PM - 3:30 PM

C3P-P: Medical Sensing Applications II

LOCATION: Poster Area

SESSION CHAIR:

Christian Zorman, Case Western Reserve University

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^{1}CENSAM, Singapore; ^{2}Macquarie University, Australia; ^{3}MIT, United States; ^{4}Nanyang Technological Univ., Singapore

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^{1}Galway Clinic, Ireland; ^{2}University of Limerick, Ireland

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University College London, United Kingdom

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^{1}University of Washington, United States; ^{2}University of Washington Bothell, United States

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^{1}Conservatoire National des Arts et Métiers, France; ^{2}Hôpital Universitaire Sahloul, Tunisia; ^{3}Université de Monastir, Tunisia; ^{4}Université du Maine, France

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Johns Hopkins University, United States

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Fatima Bamarouf, Claire Crandell, Shannon Tsuyuki, Jose Sanchez, Yufeng Lu

Bradley University, United States

1:30 PM - 3:30 PM

C3P-Q: Focused Session Posters: Wearable Tactile/Pressure Sensors & Skin Monitoring

LOCATION: Poster Area

SESSION CHAIRS:

Mustafa Ilker Beyaz, Antalya International University

Hung Cao, University of Washington

C-13-326

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TACTILE PRESSURE SENSOR1517

Matthew D'Asaro, Daniel Sheen, Jeffrey Lang

Massachusetts Institute of Technology, United States

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Yonsei University, Korea, South

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{1}Dublin City University, Ireland; {2}Smartex Srl, Italy

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Alpen-Adria-Universität Klagenfurt, Austria

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Samsung Advanced Institute of Technology, Korea, South

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OPTICSN/A

Young Chang Jo{1}, Hae Na Kim{1}, Hyuck Ki Hong{1}, Teon Shik Choi{1}, Suk Won Jung{1}, Jae-Hwan Kang{2}, Sung-Phil Kim{2}

{1}Korea Electronics Technology Institute, Korea, South; {2}Ulsan National Institute of Science and Technology, Korea, South

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North Carolina State University, United States

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Saisai Wen, Hadi Heidari, Anastasios Vilouras, Ravinder Dahiya

University of Glasgow, United Kingdom

1:30 PM - 3:30 PM
C3P-R: Wired & Wireless Sensor Systems
LOCATION: Poster Area
SESSION CHAIR:
Shad Roundy, University of Utah

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Bundesanstalt für Materialforschung und -prüfung, Germany
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Nanyang Technological University, Singapore
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{1}Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France; {2}Laboratoire d'Analyse et d'Architecture des Systèmes / Université de Toulouse, France
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Mrinmoy Sen{1}, Indrajit Banerjee{1}, Mainak Chatterjee{2}, Tuhina Samanta{1}
{1}Indian Institute of Engineering Science and Technology, Shibpur, India; {2}University of Central Florida, United States
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{1}Chinese University of Hong Kong, Hong Kong; {2}University of Southampton, United Kingdom
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Sung Kyun Kwan University, Korea, South
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Abu Dhabi University, U.A.E.
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VTT Technical Research Centre of Finland, Finland

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Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France

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Anton Netchaev, Jordan Klein, Clayton Thurmer, Brandon Carver, James Evans
U.S. Army Engineer Research and Development Center, United States

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Tore Leikanger, Christian Schuss, Juha Häkkinen
University of Oulu, Finland

1:30 PM - 3:30 PM
C3P-S: Focused Session Posters: Resonators
LOCATION: Poster Area
SESSION CHAIR:
Vikrant Gokhale, University of Michigan

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Tottori University, Japan

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Liangchen Ye^{2}, Gaofei Zhang^{2}, Zhen You^{2}, Chi Zhang^{1}
^{1}Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences, China; ^{2}Tsinghua University, China

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City University of Hong Kong, Hong Kong

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^{1}KOA Corporation, Japan; ^{2}Waseda University, Japan

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Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France

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Clemson University, United States

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Mohammad Abdolrazzaghi{2}, Mohammad Hossein Zarifi{2}, Mojgan Daneshmand{2}, Cedric F. A. Floquet{1}
{1}Schlumberger DBR Technology Center, Canada; {2}University of Alberta, Canada

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Eren Aydin{1}, Mustafa Kangül{1}, Furkan Gökçe{1}, özge Zorlu{2}, Haluk Külah{1}
{1}Middle East Technical University, Turkey; {2}Mikrobiyo Sistemler Elektronik Sanayi A.Ş., Turkey

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Mitsubishi Electric Research Laboratories, United States

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Mayur Ghatge, Roozbeh Tabrizian
University of Florida, United States

1:30 PM - 3:30 PM

C3P-T: Focused Session Posters: MEMS Energy Harvesting & Devices

LOCATION: Poster Area

SESSION CHAIR:

Qian Zhang, Analog Devices, Inc.

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Chaoran Liu{2}, Xiaofeng Zhou{1}, Lufeng Che{1}
{1}Shanghai Institute of Microsystem and Information Technology / Chinese Academy of Sciences, China;
{2}Shanghai Institute of Microsystem and Information Technology / University of Chinese Academy of Scie, China

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Kanazawa Institute of Technology, Japan

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Thuy Le{1}, Binh Truong{2}, Cuong Le{2}, Sebastian Sager{1}
{1}Otto-von-Guericke-Universität Magdeburg, Germany; {2}University College of Southeast Norway, Norway

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<i>State University of New York at Binghamton, United States</i>	
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<i>South University of Science and Technology of China, China</i>	
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<i>Maedeh Mohammadifar, Yang Gao, Seokheun Choi</i>	
<i>State University of New York at Binghamton, United States</i>	
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<i>Amer Chlahawi, Sepehr Emamian, Binu Narakathu, Bradley Bazuin, Massood Zandi Atashbar</i>	
<i>Western Michigan University, United States</i>	
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<i>Carlo Trigona, Salvatore Giuffrida, Bruno Andò, Salvatore Baglio</i>	
<i>Università degli Studi di Catania, Italy</i>	
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KINETIC ENERGY HARVESTING USING IMPROVED ECCENTRIC ROTOR ARCHITECTURE FOR WEARABLE SENSORS.....	1628
<i>Qian Zhang^{1}, Lei Gu^{1}, Ken Yang^{1}, Miah Halim^{2}, Robert Rantz^{2}, Shad Roundy^{2}</i>	
<i>^{1}Analog Devices, Inc., United States; ^{2}University of Utah, United States</i>	

4:00 PM - 5:30 PM

C4L-A: Physical Sensors IV: Mechanical & Thermal Sensors

LOCATION: Curacao 1-2

SESSION CHAIRS:

Roman Beigelbeck, Krems University

Bernard Jakoby, Johannes Kepler University Linz, Austria

4:00

DEVELOPING A PASSIVE DC CURRENT SENSOR.....1631

Huan Liu^{1}, Dingkang Wang^{2}, Dong F. Wang^{1}
^{1}Jilin University, China; ^{2}University of Florida, United States

4:15

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Ahmed M. Abdul-Wahed, Anindya Roy, Kenichi Takahata
University of British Columbia, Canada

4:30

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University of Missouri, United States

4:45

CHARACTERIZATION OF PIEZORESISTIVE AND ELECTROTHERMAL SENSORS IN MEMS DEVICES1640

Mohammad Maroufi, S. O. Reza Moheimani
University of Texas at Dallas, United States

5:00

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Hardik Pandya^{1}, Jun Sheng^{2}, Jaydev Desai^{2}
^{1}Brigham and Women's Hospital / Harvard Medical School, United States; ^{2}Georgia Institute of Technology, United States

5:15

GRAPHENE OXIDE BASED SENSOR WITH DIFFERENTIAL STRUCTURE FOR HUMIDITY AND TEMPERATURE DETECTION.....1646

Xiaohui Leng, Xingwei Chen, Fei Wang
South University of Science and Technology of China, China

4:00 PM - 5:30 PM

C4L-B: Physical Biosensors & Fluidics

LOCATION: Curacao 3-4

SESSION CHAIRS:

Paddy French, TU Delft

Michael Vellekoop, University of Bremen

4:00

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Qiushi Jiang^{1}, Ping Chen^{1}, Suiqiong Li^{1}, Heming Zhao^{1}, Yuzhe Liu^{2}, Shin Horikawa^{2}, Bryan Chin^{2}
^{1}Soochow University, China, ^{2}Auburn University, United States

4:15

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Mohammad Abdolrazzaghi, Mohammad Hossein Zarifi, Mojgan Daneshmand
University of Alberta, Canada

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Yang Gao^{1}, Maedeh Mohammadifar^{1}, Daniel Hassett^{2}, Seokheun Choi^{1}
^{1}State University of New York at Binghamton, United States; ^{2}University of Cincinnati College of Medicine, United States

4:45

RAPID DETECTION OF THEOPHYLLINE USING APTAMER-BASED NANOPORE THIN FILM SENSOR.....1658

Silu Feng, Xiangchen Che, Long Que, Changtian Chen, Wei Wang
Iowa State University, United States

5:00

AN AUTOMATED MICROFLUIDIC ASSAY FOR THE DETECTION OF CANCER BIOMARKERS IN SERUM USING PHOTONIC CRYSTAL ENHANCED FLUORESCENCE.....1661

Lydia Kwon, Caitlin Race, Myles Foreman, Brian T. Cunningham
University of Illinois at Urbana–Champaign, United States

5:15

ACHIEVING UNIFORMITY AND REPRODUCIBILITY FOR PHOTONIC CRYSTAL FLUORESCENCE ENHANCED DISEASE DIAGNOSTIC MICROARRAYS1664

Caitlin Race, Lydia Kwon, Brian T. Cunningham
University of Illinois at Urbana–Champaign, United States

4:00 PM - 5:30 PM

C4L-C: Wireless Sensors & Interfaces

LOCATION: Curacao 5-6

SESSION CHAIRS:

Mehdi Kiani, Penn State University

Ryutaro Maeda, AIST

4:00

INVITED: WIRELESS HYDROGEL-BASED GLUCOSE SENSOR FOR FUTURE

IMPLANTABLE APPLICATIONS1667

Yuechuan Yu, Tram Nguyen, Prashant Tathireddy, Darrin Young, Shad Roundy

University of Utah, United States

4:30

SELF-POWERED AND TRANSPARENT ALL-GRAPHENE BIOSENSOR1670

Ali Shahini{2}, Mehdi Hajizadegan{2}, Maryam Sakhdari{2}, Mark Ming-Cheng Cheng{2}, Pai-Yen Chen{2}, Haiyu Huang{1}

{1}Maxim Integrated Inc., United States; {2}Wayne State University, United States

4:45

PASSIVELY-POWERED WIRELESS MICROMACHINED QUARTZ

MAGNETOFLEXOELASTIC MAGNETOMETER1673

Paul Nordeen{2}, Grergory P. Carman{2}, Eugene Freeman{1}, Gokhan Hatipoglu{1}, Srinivas Tadigadapa{1}

{1}Pennsylvania State University, United States; {2}University of California, Los Angeles, United States

5:00

AN EMBEDDED SYSTEM TO CONTROL CONDUCTING INTERPENETRATING POLYMER

NETWORKS ACTUATORS1676

Tien Anh Nguyen{3}, Luc Chassagne{3}, Barthélemy Cagneau{3}, Adelyne Fannir{2}, Kätlin Rohtlaid{2}, Tran Minh Giao Nguyen{2}, Cedric Plesse{2}, Frédéric Vidal{2}, Chia-Ju Peng{1}, Shih-Jui Chen{1}

{1}National Central University, Taiwan; {2}Université de Cergy-Pontoise, France; {3}Université de Versailles Saint-Quentin-en-Yvelines, France

5:15

PROGRAMMABLE MULTIMODE, MULTICHANNEL UNIVERSAL WIRELESS RECEIVER WITH

FFT-BASED MULTICARRIER DEMODULATOR FOR BATTERYLESS WIRELESS SENSORS1679

Hisashi Nishikawa, Kei Igarashi, Takeshi Nishihashi, Yuya Shimizu, Ryota Suematsu, Ami Tanaka, Takakuni Douseki

Ritsumeikan University, Japan

4:00 PM - 5:30 PM

C4L-D: Sensors & Systems for Health Monitoring & Harsh Environments

LOCATION: Curacao 7-8

SESSION CHAIR:

Christian Zorman, Case Western Reserve University

4:00

INVITED: WIRELESS BLADDER PRESSURE MONITOR FOR CLOSED-LOOP

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Steve Majerus{3}, Anisha S. Basu{1}, Iryna Makovey{2}, Peng Wang{1}, Hui Zhui{3}, Christian Zorman{1}, Wen Ko{1}, Margot Damaser{3}

{1}Case Western Reserve University, United States; {2}Cleveland Clinic, United States; {3}Cleveland VA Medical Center, United States

4:30

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Karthik Konnaiyan{1}, Surya Cheemalapati{1}, Anna Pyayt{1}, Michael Gubanov{2}

{1}University of South Florida, United States; {2}University of Texas at San Antonio, United States

4:45

ROBUST IMPLANTABLE BLOOD PRESSURE SENSOR PACKAGING FOR LONG-TERM

LABORATORY ANIMALS MONITORING1688

Xing Chen, Darrin Young

University of Utah, United States

5:00

MULTI-SENSOR MODULE FOR A MOBILE ROBOT OPERATING IN HARSH ENVIRONMENTS.....1691

Guangfen Wei{1}, Julian Gardner{2}, Marina Cole{2}, Yuxin Xing{2}

{1}Shandong Technology and Business University, China; {2}University of Warwick, United Kingdom

5:15

GLASS MICROBUBBLE ON-CHIP PACKAGED FERROFLUID BASED

MAGNETOVISCOUS MAGNETOMETER..... N/A

Chenchen Zhang, Eugene Freeman, Srinivas Tadigadapa

Pennsylvania State University, United States

4:00 PM - 5:30 PM

C4L-E: Sensor Network, Applications and IoT

LOCATION: Bonaire 1-2

SESSION CHAIRS:

Fabien Josse, Marquette University

Sang-Seok Lee, Tottori University

4:00

INVITED: ULTRA-THIN PIEZOELECTRIC STRAIN SENSOR ARRAY INTEGRATED ON FLEXIBLE PRINTED CIRCUIT FOR STRUCTURAL HEALTH MONITORING.....1697

Takahiro Yamashita{2}, Hironao Okada{2}, Takeshi Kobayashi{2}, Daniel Zymelka{3}, Kazuyoshi Togashi{1}, Seiichi Takamatsu{4}, Toshihiro Itoh{4}
{1}Dai Nippon Printing Co., Ltd., Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan; {3}NMEMS Technology Research Organization / National Institute of Advanced Industrial Science and Techn, Japan; {4}University of Tokyo / N

4:30

VIBRATING BEAM MEMS SEISMOMETER FOR FOOTSTEP AND VEHICLE DETECTION1700

Raphael Levy, Julien Moras, Benjamin Pannetier
Office National d'Etudes et de Recherches Aérospatiales, France

4:45

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Yuji Yamakawa, Masatoshi Ishikawa, Makoto Shimojo, Akihito Noda
University of Tokyo, Japan

5:00

WAGGLE: AN OPEN SENSOR PLATFORM FOR EDGE COMPUTING1706

Pete Beckman, Rajesh Sankaran, Charlie Catlett, Nicola Ferrier, Robert Jacob, Michael Papka
Argonne National Laboratory, United States

5:15

A NEW DISTRIBUTED ALGORITHM FOR ENVIRONMENTAL MONITORING BY WIRELESS SENSOR NETWORKS WITH LIMITED COMMUNICATION1709

Jing Wang{1}, In Soo Ahn{1}, Yufeng Lu{1}, Gennady Staskevich{2}
{1}Bradley University, United States; {2}U.S. Air Force Research Laboratory, United States

4:00 PM - 5:30 PM

C4L-F: Focused Session: Energy Harvesting & Low-Power Sensors II

LOCATION: Bonaire 3-4

SESSION CHAIRS:

Shashank Priya, Virginia Tech

Ryohei Takei, National Institute of Advanced Industrial Science and Technology

4:00

WIRELESS VIBRATION SENSING SYSTEM POWERED BY A PIEZOELECTRIC MEMS VIBRATION ENERGY HARVESTER1712

Ryohei Takei{2}, Hironao Okada{2}, Takeshi Kobayashi{2}, Daiji Noda{1}, Ryo Ohta{1}, Toshihiro Itoh{3} {1}Micromachine Center, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan; {3}University of Tokyo / National Institute of Advanced Industrial Science and Technology, Japan

4:15

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*Marco Lasagni, Paolo Pavan, Alessandro Bertacchini, Luca Larcher
Università degli Studi di Modena e Reggio Emilia, Italy*

4:30

A FULLY INTEGRATED ELECTROMAGNETIC ENERGY HARVESTING CIRCUIT WITH AN ON-CHIP ANTENNA FOR BIOMEDICAL IMPLANTS IN 180 NM SOI CMOS1718

*Hamed Rahmani, Aydin Babakhani
Rice University, United States*

4:45

SELF-POWERED WIRELESS URINARY-INCONTINENCE SENSOR DETERMINES TIME FOR DIAPER CHANGE FROM SPACING BETWEEN SENSING SIGNALS1721

*Ami Tanaka, Ryota Suematsu, Hiroya Sakamoto, Takakuni Douseki
Ritsumeikan University, Japan*

5:00

TEMPERATURE BEAT: PERSISTENT AND ENERGY HARVESTING WIRELESS TEMPERATURE SENSING SCHEME1724

*Ryohei Takitoge, Shohei Ishigaki, Tsuyoshi Ishige, Koichiro Ishibashi
University of Electro-Communications, Japan*

5:15

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*Maedeh Mohammadifar, Jing Zhang, Idris Yazgan, Victor Kariuki, Omowunmi Sadik, Seokheun Choi
State University of New York at Binghamton, United States*

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