

**APCOT 2016  
ORAL PROGRAM**

**Monday, 27 June 2016**

**9:15-10:00**

**Invited Plenary Talk 1**

Yogesh Gianchandani, Michigan University, USA

**Monday, 27 June 2016**

**10:00-10:45**

**Invited Plenary Talk 2**

Kenzo Nonami, Chiba University, Japan

**Monday, 27 June 2016**

**11:00 -12:15**

**Session 1a CMOS Integration and Packaging**

**Keynote Talk 1**

**Chinghan Huang**

**ASE, Taiwan**

**AUTOMATED RESONANCE MATCHING FOR CMOS MEMS RESONANT SENSORS**

Yi-Kai Liao, Che-Hao Chiang, Michael Lu  
National Tsing Hua University, Taiwan  
[1039]

**ELECTRICAL RELIABILITY OF SURFACE MICROMACHINED POLYSILICON RESONATORS IN HIGH SHOCK ENVIRONMENTS**

Yingying Wang, Lei Wang, Jieying Tang, Jing Song  
Southeast University, China  
[1024]

**INFLUENCE OF SOLDER THICKNESS ON FRACTURE BEHAVIOR OF AL/NI REACTIVELY-BONDED SOLDER JOINTS FOR RELIABILITY OF MEMS**

Koichi Kuwahara, Shunsuke Kanetsuki, Shugo Miyake, Shozo Inoue, Takahiro Namazu  
University of Hyogo, Japan, Kobelco Research Institute Inc., Japan, Kobe City College of Technology, Japan  
[1106]

**A LOW-NOISE LOW-POWER NEURAL RECORDING AMPLIFIER ON FLEXIBLE THIN FILM FOR FULLY IMPLANTABLE NEURAL INTERFACE DEVICES**

Prabhath J. Horagodage, Kenji Okabe, Hajime Fukumaru, Takeshi Kawano, Makoto Ishida, Ippei Akita  
Toyohashi University of Technology, Japan  
[1204]

**Monday, 27 June 2016**

**11:00 -12:15**

**Session 1b Movable Devices**

**AN OPTICAL SYSTEM FOR BI-DIRECTIONAL FREE SPACE OPTICAL COMMUNICATION WITH ACQUISITION AND TRACKING CAPABILITIES**

Sungho Jeon, Hiroshi Toshiyoshi  
University of Tokyo, Japan  
[1091]

**DESIGN AND MODELLING OF A NOVEL MICRO-LENS PIEZOELECTRIC ACTUATOR FOR FAST AND LARGE STROKE GENERATION**

Truong Xuan Nguyen, Michael Aron, Kwok Chee Yee, Wang Peng  
The University of New South Wales, Australia  
[1169]

**AN SOI THERMAL-PIEZORESISTIVE MEMS RESONATOR ARRAY WITH A FULLY DIFFERENTIAL MODE OF OPERATION**

Chia-Chun Chu, Cheng-Chi Chen Sheng-Shian Li  
National Tsing Hua University  
[1303]

**BIAS VOLTAGES DETERMINATION FOR INVESTIGATION OF THE INFLUENCE OF SHORT BEAM LENGTH VARIATION IN FISHBONE-SHAPED MEMS RESONATOR ON RESONANCE FREQUENCY**

Ryo Takahashi, Hidetoshi Miyashita, Masahiro Kondo, Tomoaki Kageyama, Sang-Seok Lee  
Tottori University, Japan  
[1133]

**DEVELOPMENT OF OHMIC CONTACT TYPE RF MEMS SWITCH AND INVESTIGATION OF DC BIAS RESISTANCE INFLUENCE ON ITS RF CHARACTERISTICS**

Tomoaki Kageyama, Maya Kato, Hidetoshi Miyashita, Sang-Seok Lee  
Tottori University, Japan, Japan Aerospace Exploration Agency (JAXA), Japan  
[1129]

**DESIGN OF MICROWAVE POWER SENSOR WITH ENHANCED POWER HANDLING CAPACITY BASED ON MIM CAPACITOR**

Zhenxiang Yi  
Southeast University, China  
[1008]

**Monday, 27 June 2016**

**11:00 -12:15**

**Session 1c Microfluidics 1**

**Keynote Talk 2**

**Hongkai Wu**

**Hong Kong University of Science and Technology**

**OPTOFLUIDIC TUNABLE LENS USING LASER-INDUCED THERMAL GRADIENT**

Qingming CHEN, Xuming Zhang  
The Hong Kong Polytechnic University, Hong Kong  
[1083]

**INVESTIGATION OF INTEGRATED MICROFLUIDICS WITH METAMATERIALS WORKING IN THZ REGION**

Kailing Shih, Prakash Pitchappa, Manukumara Manjappa, Ranjan Singh, Chengkuo Lee  
National University of Singapore, Singapore, Nanyang Technological University, Singapore  
[1030]

**A MICROFLUIDIC DEVICE FOR COLLECTION OF ULTRA-FINE DROPLETS IN DISPERSIVE LIQUID PHASE MICROEXTRACTION**

Zhenhan Li, Shanhong Xia, Jinfen Wang  
Institute of Electronics, Chinese Academy of Sciences, China  
[1090]

**AN EXPLORATORY ATTEMPT FOR ELECTROWETTING ON THIN-FILM-TRANSISTOR ARRAY**

Faruk Azam Shaik, Grant Alexander Cathcart, Satoshi Ihida, Jiro KAWADA, Yoshiho Ikeuchi, Agnes Tixier-Mita, Hiroshi Toshiyoshi  
RCAST, The University of Tokyo, Japan, IIS, The University of Tokyo, Japan  
[1112]

**Monday, 27 June 2016**

**11:00 -12:15**

**Session 1d Optical Sensors**

**DEVELOPMENT OF AN OPTICAL QUANTITATIVE DETECTION SYSTEM FOR IN-VITRO TEST STRIPS**

Chia-Hsien Yeh, Guan-Chen Lin, Pi-Lan Shen, I-Yu Huang, Yu-Cheng Lin  
National Cheng Kung University, Taiwan, Firststep Bioresearch, Inc, Taiwan, National Sun Yat-sen University,  
Taiwan, National Cheng Kung University, Taiwan  
[1017]

**A MICRO ABSORPTION SPECTROSCOPY SYSTEM USING OPTICAL FIBERS**

Motohide Yoshimi, Shinya Kumagai, Yasutake Ohishi, Minoru Sasaki  
Toyota Technological Institute, Japan  
[1029]

**WIDE DYNAMIC RANGE FILTER-FREE FLUORESCENCE DETECTION SENSOR WITH TRIPLE-WELL STRUCTURE**

Yu Moriwaki, Kiyotugu Tanaka, Kazuhiro Takahashi, Tatsuya Iwata, Ippei Akita, Fumihiko Dasai, Yasuyuki  
Kimura, Makoto Ishida, Kazuaki Sawada  
Toyohashi University of Technology, Japan  
[1084]

**IN-SITU SYNTHESIS OF CDS NANOWIRE PHOTODIODE FOR CHEMILUMINESCENT IMMUNOASSAYS**

Jae-Chul Pyun, Byoung-Gi An, Hong-Rae Kim, Young Wook Chang, Jae-Gwan Park  
Yonsei Univ, Republic of Korea, Korea Institute of Science and Technology (KIST), Republic of Korea  
[1111]

**PERFORMANCE ANALYSIS OF FILTER-FREE FLUORESCENCE SENSOR USING FITC DYE**

Yong Joon Choi, Kazuhiro Takahashi, Motoharu Matsuda, Takeshi Hizawa, Yu Moriwaki, Fumihiko Dasai,  
Yasuyuki Kimura, Tatsuya Iwata, Makoto Ishida, Kazuaki Sawada  
Toyohashi University of Technology, Japan  
[1175]

**Monday, 27 June 2016**

**15:00-16:30**

**Session 2a Force Sensors**

**TEXTURE CHARACTERIZATION INCLUDING WARM/COOL SENSATION BY FORCE, LIGHT, AND TEMPERATURE SENSITIVE MEMS SENSOR**

Fumiya Sato, Kenta Takahashi, Takashi Abe, Masanori Okuyama, Haruo Noma, Masayuki Sohngawa  
Niigata University, Japan, Osaka University, Japan, Ritsumeikan University, Japan  
[1154]

**MEASUREMENT OF SURFACE TEXTURE ON CLOTH SAMPLES USING A HIGHLY SENSITIVE TWO-AXIS TACTILE SENSOR**

Kazuki Watatani, Ryogo Kozai, Kyohei Terao, Fusao Shimokawa, Hidekuni Takao  
Kagawa University, Japan  
[1187]

**DEVELOPMENT OF 8x8 TACTILE SENSING ARRAYS FOR HUMAN-WALK-ASSISTING ROBOT**

Cheng-Wen Ma, Fu-Wei Lee, Yu-Yang Chang, Yu-Hsuan Lin, Yao-Joe Yang  
National Taiwan University, Taiwan  
[1203]

**3D PRINTING OF FORCE SENSOR USING FUNCTIONALIZED NANOCOMPOSITE FILAMENTS**

Kyuyoung Kim, Inkyu Park  
KAIST, Republic of Korea  
[1173]

#### **FABRICATION OF FORCE SENSOR FOR STUDYING SEED GERMINATION OF PLANTS**

Hirota Hida, Shinpei Fujimoto, Tetsuya Higashiyama, Michitaka Notaguchi, Isaku Kanno  
Kobe University, Japan, Nagoya University, Japan  
[1191]

#### **A FLEXIBLE PIEZORESISTIVE PRESSURE SENSOR BASED ON CARBON NANOTUBE-COATED POROUS ELASTOMER AND DEVELOPMENT OF FLEXIBLE PIANO PAD**

Seunghwan Kim, Tae-Ik Lee, Yongrok Jeong, Donguk Kwon, Min Seong Kim, Taek-Soo Kim, Inkyu Park  
Korea Advanced Institute of Science and Technology(KAIST), Republic of Korea  
[1177]

**Monday, 27 June 2016**

**15:00-16:30**

### **Session 2b Material Characterization**

#### **LIFT-OFF PROCESS FOR FINE-PATTERNED PZT FILM USING METAL OXIDE AS A SACRIFICIAL LAYER**

Trong Tue Phan, Tatsuya Shimoda, Yuzuru Takamura  
Japan Advanced Institute of Science and Technology, Japan, Japan Science and Technology, CREST, Japan  
[1123]

#### **CHARACTERIZATION OF CRUMPLED VERTICALLY ALIGNED GRAPHENE FOR HIGH PERFORMANCE MICRO SUPERCAPACITOR**

Hafzaliza Erny Zainal Abidin, Azrul Azlan Hamzah, Mohd Ambri Mohamed, Burhanuddin Yeop Majlis  
Universiti Kebangsaan Malaysia, Malaysia  
[1119]

#### **MECHANICAL PROPERTIES OF SILICON NANOWIRES FABRICATED BY USING FOCUSED ION BEAM AND SACRIFICIAL OXIDATION TECHNIQUES**

Ginnosuke Ina, Tatsuya Fujii, Takahiro Kozeki, Shozo Inoue, Takahiro Namazu  
University of Hyogo, Japan  
[1131]

#### **CHARACTERIZATION OF ELECTRODEPOSITED NANOCRYSTALLINE NICKEL WITH A LOW BORON CONTENT FOR MEMS APPLICATION**

Hong Bum Gwon, Hye Rin Ahn, Kyung Tae Kim  
Yonsei University, Republic of Korea  
[1070]

#### **INFLUENCE OF FOCUSED ION BEAM IRRADIATION ON MECHANICAL RELIABILITY OF 3C-SIC FILM**

Kosuke Tanaka, Dao V. Dzung, Shozo Inoue, Takahiro Namazu  
University of Hyogo, Japan, Griffith University, Australia  
[1132]

**Monday, 27 June 2016**

**15:00-16:30**

### **Session 2c Microfluidics 2**

#### **Keynote Talk 3**

**Zhen Zhu**

**Southeast University, China**

#### **USING THE DROPLET-FUSION MICROFLUIDIC CHIP FOR PRODUCING ALGINATE MICROCAPSULE WITH DIFFERENT BSA CONCENTRATIONS**

Chia-Hsien Yeh, Shen-Yang Lin, I-Yu Huang, Yu-Cheng Lin  
National Cheng Kung University, Taiwan, National Sun Yat-sen University, Taiwan  
[1018]

**MICRO ELECTROSTATIC PRECIPITATION SAMPLER FOR PERSONAL BIOAEROSOL SAMPLING**

Dong-Hyun Kang, Ji-Ye Um, Hong-Lae Kim, Sang-Myun Lee, Yong-Jun Kim  
Yonsei University, Republic of Korea  
[1053]

**DEVELOPMENT OF A SMALL ELECTROCHEMICAL TITRATOR WITH PYRAMIDAL MICROFLUIDIC NETWORK**

Hiroki Kakimoto, Shunichi Higuchi, Yoshiki Takesako, Ryo Miyake, Yuji Murakami  
Toyohashi University of Technology, Japan, The University of Tokyo, Japan  
[1058]

**COMPARISON OF BACTERIAL STRESS RESPONSES BETWEEN LEGIONELLA PNEUMOPHILA AND LEGIONELLA DUMOFFII TRAPPED IN A MEMS MICROFLUIDIC CHIP**

Yusuke Nishimura, Onishi Shuhei, Makoto Ishida, Kazuaki Sawada, Hiromu Ishii, Katsuyuki Machida, Kazuya Masu, Changle Wang, Mitsumasa Saito, Shinichi Yoshida  
Toyohashi University of Technology, Japan, Tokyo Institute of Technology, Japan, Kyusyu University, Japan  
[1155]

**Monday, 27 June 2016**

**15:00-16:30**

**Session 2d Gas Sensors**

**FABRICATION OF A NOVEL FLEXIBLE ACETYLENE GAS SENSOR BASED ON AG-ZNO NANORODS ON PI/PDMS SUBSTRATE**

A. S. M. Iftexhar Uddin, Gwi-Sang Chung  
University of Ulsan, Republic of Korea  
[1006]

**MOS GAS SENSORS BASED ON MICRO/NANOSTRUCTURED ORDERED ARRAY**

Guotao Duan, Zongke Xu, Xingsong Su, Weiping Cai  
Hefei Institutes of Physical Science, Chinese Academy of Sciences, China  
[1027]

**TEMPERATURE AND CONCENTRATION DEPENDENT PROPERTIES OF A NON- DISPERSIVE INFRARED (NDIR) CARBON DIOXIDE GAS SENSOR**

Maniruzzaman Nuran, SeungHwan Yi  
Korea National University of Transportation, Republic of Korea  
[1054]

**THERMAL STABILITY IMPROVEMENT OF PT ULTRATHIN-FILM HYDROGEN SENSOR USING TIN**

Shota Inami, Ryo Furukawa, Kenji Sakai, Toshihiko Kiwa, Keiji Tsukada  
Okayama University, Japan  
[1075]

**PROPOSAL OF STRESS-TOLERANT MICRO-HOTPLATES WITH SU-8 SUSPENSION FOR SMART GAS SENSING SYSTEM**

Tatsuya Iwata, Carine W. Soo Ping, Kyosuke Matsuda, Kazuhiro Takahashi, Makoto Ishida, Kazuaki Sawada  
Toyohashi University of Technology, Japan  
[1079]

**TANTALUM OXIDES FORMED ON SIC SUBSTRATE BY RAPID THERMAL OXIDATION FOR HYDROGEN GAS SENSORS**

SEONGJEEN KIM, SANGCHEOL KIM  
Kyungnam University, Republic of Korea, KERI, Republic of Korea  
[1146]

**Monday, 27 June 2016**

**16:45-18:15**

**Session 3a 3D Microstructures**

**SIZE CONTROL AND COMPLEX COMPARTMENTALIZATION OF HYDROGEL MICROSPRINGS**

Koki Yoshida, Hiroaki Onoe

Keio University, Japan

[1028]

**DEVELOPMENT OF A MULTISCALE TWO-PHOTON MICROSTEREOLITHOGRAPHY SYSTEM USING SPATIAL LIGHT MODULATORS**

Yuka Matsumoto, Kosuke Yokoyama, Shoji Maruo

Yokohama National University, Japan

[1195]

**MICROSTRUCTURES OF BIOCOMPATIBLE POLYMER FABRICATED BY NANO 3D LITHOGRAPHY**

Wan Ping Yang, Che Wei Yeh, Tzu Han Chuang, Sam Ao Leong, Jane Wang, Chien Chun Fu

National Tsing Hua University, Taiwan

[1158]

**ONE-STEP PDMS MICROMOLDING PROCESS FOR TAPERED THREE-DIMENSIONAL STRUCTURES**

Hiroaki Suzuki, Kenta Mitsuno, Katsuyuki Shiroguchi, Taiji Okano, Tetsuji Dohi, Tomoaki Tsuji

Chuo University, Japan, Riken Center for Integrative Medical Sciences, Japan

[1188]

**VAPOR-LIQUID-SOLID GROWTH OF SILICON-WIRES ON (111)-TEXTURED PLATINUM FILM/DIOXIDE/SILICON**

Makoto Yamahira, Hideo Oi, Satoshi Yagi, Yasuyuki Uraoka, Makoto Ishida, Takeshi Kawano

Toyohashi University of Technology, Japan

[1193]

**Monday, 27 June 2016**

**16:45-18:15**

**Session 3b Optical Devices**

**Keynote Talk 4**

**Chengkuo Lee**

**National University of Singapore**

**A VARIABLE-FOCUS CAMERA INTEGRATED WITH ALVAREZ LENS DRIVEN BY MEMS-THERMAL ACTUATOR**

Wei Zhang, Yongchao Zou, Tong Lin, Fook Siong Chau, Guangya Zhou

National University of Singapore, Singapore

[1108]

**FABRICATION OF MEMS DEFORMABLE MIRROR ACTUATED BY ELECTROSTATIC PISTON ARRAY**

Akiko Uno, Vijay K. Singh, Yoshikazu Hirai, Toshiyuki Tsuchiya, Osamu Tabata

University of Kyoto, Japan

[1113]

**MID-INFRARED BANDWIDTH REDUCTION BASED ON WEAK COUPLING FANOLIKE RESONANCE**

Aisheng Yu, Wei Li, Lianfeng Guo, Yuelin Wang, Tie Li

Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

[1007]

**WIDELY TUNABLE PLASMONIC BANDPASS FILTER INTEGRATED WITH AL SUBWAVELENGTH GRATING AND COMB-DRIVE ACTUATORS**

Hiroaki Honma, Kazuhiro Takahashi, Makoto Ishida, Kazuaki Sawada

Toyohashi University of Technology, Japan

[1142]

**Monday, 27 June 2016**

**16:45-18:15**

**Session 3c Cells**

**Keynote Talk 5**

**Shoji Takeuchi**

**The University of Tokyo, Japan**

**FLEXIBLE GEOMETRIC DESIGN FOR OPENABLE BIOMIMETIC TUBE PROVIDING VARIABLE FLOW CONDITIONS FOR CELL-BASED ASSAY**

Satoshi Sugama, Koji Hattori, Satoshi Konishi

Ritsumeikan University, Japan

[1022]

**AN ARRAY OF MICRO CHAMBERS TRAPPING A SINGLE CELL FOR ANALYSIS OF MOVING CELLS**

Ryota Kanamaru, Tatsuyuki Takada, Satoshi Konishi

Ritsumeikan University Japan, Japan

[1089]

**SEPARATION OF MAGNETIC PARTICLES USING AN ARRAY OF MAGNETS AS A MODEL OF MALARIA-INFECTED BLOOD CELLS SEPARATION DEVICE**

Surasak Kasetsirikul, Werayut Srituravanich, Prapruddee Piyaviriyakul, Alongkorn Pimpin

Chulalongkorn University, Thailand

[1121]

**DIELECTROPHORETIC ON-CHIP FOR SIMULTANEOUS DETECTION OF LIVE CELL RESPONSES TO SMALL MOLECULE DRUGS**

In Soo Park, Kwan Hwi Ko, Min Hyung Kim, Sang woo Lee

University of Yonsei, Republic of Korea

[1164]

**Monday, 27 June 2016**

**16:45-18:15**

**Session 3d Image Sensors**

**FLUORESCENCE-BASED IMPLANTABLE GLUCOSE SENSOR USING CMOS IMAGE SENSOR TECHNOLOGY**

Takashi Tokuda, Hiroaki Takehara, Toshihiko Noda, Kiyotaka Sasagawa, Teru Okitsu, Shoji Takeuchi, Jun Ohta

Nara Institute of Science and Technology, Japan, The University of Tokyo, Japan

[1020]

**LIVE-IMAGING OF CELL GLYCOLYSIS USING PROTON IMAGE SENSOR**

Toshishige Fujii, Akiteru Kono, Tomoko Horio, Takanori Tano, Kazuaki Sawada

RICOH COMPANY, LTD., Japan, Toyohashi University of Technology, Japan

[1047]

**FEATURE EXTRACTION METHOD IN MULTIPLE-ORS-BASED ODOR BIOSENSING SYSTEM**

Nitikarn Nimsuk, Totok Mujiono, Yuji Sukekawa, Takamichi Nakamoto, Hidefumi Mitsuno, Maneerat

Termtanasombat, Ryohei Kanzaki, Nobuo Misawa

Tokyo Institute of Technology, Japan, The University of Tokyo, Japan, Toyohashi University of Technology, Japan

[1062]

**INTRACELLULAR IMAGING OF MOLECULAR DYNAMICS IN LIVING CELLS BASED ON TIP-ENHANCED RAMAN SPECTROSCOPY**

Takayuki Shibata, Goh Miyazaki, Terutake Hayashi, Moeto Nagai

Toyohashi University of Technology, Japan, Kyushu University, Japan

[1118]

**REALIZED PH IMAGING WITH 1.15  $\mu\text{M}$  PITCH BY NEW STRUCTURE 2TR.TYPE SENSOR**

Shin Watanabe, Kazuki Shimizu, Kenji Araki, Fumihiko Dasai, Makoto Ishida, Kazuaki Sawada  
Toyohashi University of Technology, Japan  
[1159]

**DEVELOPMENT OF A BIO-IMAGE SENSOR FOR MULTIPLEX DETECTION BASED ON ENZYME IMMOBILIZATION TECHNIQUE**

You-Na Lee, Koichi Okumura, Tatsuya Iwata, Kazuhiro Takahashi, Toshiaki Hattori, Makoto Ishida, Kazuaki Sawada  
Toyohashi University of Technology, Japan, Electronics-Inspired Interdisciplinary Research Institute, Japan  
[1198]

**Tuesday, 28 June 2016**

**9:00-9:45**

**Invited Plenary Talk 3**

Christofer Hierold, ETH Zurich, Switzerland

**Tuesday, 28 June 2016**

**9:45-10:30**

**Invited Plenary Talk 4**

Tai Hyun Park, Seoul National University, Korea

**Tuesday, 28 June 2016**

**10:45-11:45**

**Session 4a Liquid Phase Materials**

**Keynote Talk 6**

**Shinpei Ono**

**CRIEPI, Japan**

**NOVEL APPROACH FOR OXIDATION-PROOF LIQUID METAL GALINSTAN USING THE PARYLENE SEALED NEUTRAL SOLVENT PARAFFIN OIL**

Ming-Yi Lin, Fu-Ming Hsu, Jhih-Jhe Wang, Weileun Fang  
National Tsing Hua University of Hsinchu, Taiwan  
[1086]

**MICRO DIAPHRAGM VALVE DRIVEN BY A THERMALLY RESPONSIVE SOLUTION FOR COMPACT PRESSURE CONTROL SYSTEM**

Yuki Tsujimura, Satoshi Konishi  
Ritsumeikan University, Japan  
[1096]

**Tuesday, 28 June 2016**

**10:45-11:45**

**Session 4b Evaluation**

**NONLINEAR DEFORMATION ANALYSIS FOR AWL-SHAPED SERPENTINE MICROSPRING**

Hui-Min Chou, Meng-Ju Lin, Rongshun Chen  
National Tsing Hua University, Taiwan, Feng Chia University, Taiwan  
[1040]

**PIEZORESISTIVE ROSETTE GAUGE TAKING INTO ACCOUNT OF SILICON CUBIC CRYSTAL ANISOTROPY**

Taeko Ando, Toshiyuki Toriyama  
Ritsumeikan University, Japan  
[1117]

**IN-SITU TESTING OF YOUNG'S MODULUS AND RESIDUAL STRESS OF POLYSILICON THIN FILM USING PULL-IN OF BUCKLED BEAMS**

Yi-Fan Gu, Zai-Fa Zhou, Wei-Hua Li, Qing-An Huang  
Southeast University, China  
[1176]

**STRESS CONTROL IN POROUS SILICON MEMS**

Adrian Keating, Xiao Sun, Gia Parish  
The University of Western Australia, Australia  
[1004]

**Tuesday, 28 June 2016**

**10:45-12:00**

**Session 4c FET Sensors**

**DEVELOPMENT OF GLUTAMATE SENSOR FOR NEUROTRANSMITTER IMAGING**

Shinya Mizutani, Yuki Okumura, Tomoko Horio, Tatsuya Iwata, Koichi Okumura, Kazuhiro Takahashi, Yuji Murakami, Fumihiro Dasai, Makoto Ishida, Kazuaki Sawada  
Toyohashi University of Technology, Japan  
[1011]

**FABRICATION OF PEPTIDE-MODIFIED SINGLE-WALLED CARBON NANOTUBE FIELD EFFECT TRANSISTOR APPLYING FOR APTASENSOR**

Tung T. Nguyen, Tue T. Phan, Lien T. N. Truong, Yasuhide Ohno, Kenzo Maehashi, Kazuhiko Matsumoto, Manish Biyani, Yuzuru Takamura  
Japan Advanced Institute of Science and Technology, Japan, Hanoi University of Science and Technology, Viet Nam, Tokushima University, Japan, Tokyo University of Agriculture and Technology, Japan, Osaka University, Japan  
[1101]

**NON-DESTRUCTIVE ANALYSIS OF CELL MEMBRANE INJURY USING PROTON-SENSITIVE FIELD-EFFECT TRANSISTOR**

Yuki Imaizumi, Tatsuro Goda, Akira Matsumoto, Yuji Miyahara  
Tokyo Medical and Dental University, Japan  
[1182]

**SENSITIVITY IMPROVING OF NANOBELT FET SENSOR AND ITS APPLICATION IN LIVER CANCER DETECTION**

Yankuba B. Manga, Chi-Chang Wu  
Taipei Medical University  
[1302]

**FABRICATION AND CHARACTERIZATION OF STRAIN-INDUCED ELECTRODES FOR BIO-MEDICAL APPLICATIONS**

Anindya Nag, Jürgen Kosel, Subhas Mukhopadhyay, Richard Haverkamp  
Massey University, New Zealand, King Abdullah University of Science and Technology, Saudi Arabia  
[1014]

**Tuesday, 28 June 2016**

**10:45-11:30**

**Session 4d Acoustic and Mechanical Sensors**

**APPLICATION OF HIGH RESONANCE FREQUENCY ACOUSTIC DEVICE IN PROTEIN DETECTIONS**

Shuting Pan, Wenpeng Liu, Yanyan Wang, Xuexin Duan  
Tianjin University, China  
[1085]

**IMPROVING INSERTION LOSS OF FLEXURAL PLATE-WAVE BASED CARCINOEMBRYONIC ANTIGEN BIOSENSOR USING FOCUS-TYPE INTER-DIGITAL TRANSDUCERS AND REFLECTIVE GRATING STRUCTURES**

Je-Wei Lan, Wen-Hui Huang, Chia-Hsu Hsieh, I-Yu Huang, Yu-Cheng Lin  
National Sun Yat-sen University, Taiwan, National Cheng Kung University, Taiwan  
[1102]

**DNA MECHANICAL CHARACTERIZATION INSIDE BIOLOGICAL BUFFER BY THE DOUBLE-ACTUATOR SILICON NANO TWEEZERS**

Gregoire Perret, Mehmet Tarhan, Nicolas Lafitte, Laurent Jalabert, Momoko Kumemura, Thomas Lacornerie, Eric Lartigau, Fabrizio Cleri, Hiroyuki Fujita, Dominique Collard  
LIMMS/CNRS-IIS, UMI2820, Japan, Centre Oscar Lambret, University of Lille 2, France, IEMN, UMR8520, CNRS, University of Lille 1, France, Institute of Industrial Science, The University of Tokyo, Japan  
[1178]

**Tuesday, 28 June 2016**

**14:45-16:15**

**Session 5a Lithography and Etching**

**RELEASE AGENT FREE ULTRAVIOLET NANOIMPRINT LITHOGRAPHY BY CYCLIC OLEFIN POLYMER AND POLYDIMETHYLSILOXANE MADE MOLD**

Yuki Hashimoto, Katsuo Mogi, Takatoki Yamamoto  
Tokyo Institute of Technology, Japan  
[1021]

**FABRICATION OF TOTAL SOLUTION-PROCESSED ALL-OXIDE TFT BY UV IRRADIATION-REDISSOLVING PATTERNING**

Yuuki Yoshimoto, Jingwang Li, Tatsuya Shimoda  
Japan Advanced Institute of Science and Technology, Japan  
[1174]

**SUPPRESS THE GENERATION OF MICRO PYRAMID ON SI (100) SURFACE ETCHED IN 1WT% KOH SOLUTION USING AIR BUBBLING**

Yuki Saito, Hiroshi Tanaka  
National institute of technology, Tsuruoka college, Japan  
[1163]

**FABRICATION OF CONDUCTIVE DIAMOND MEMBRANE FOR FUNCTIONAL TEM GRIDS USING TWO-STEP DRY ETCHING**

Bingyang Xu, Hiroyuki Kuwae, Tomohiro Edura, Hidehito Adaniya, Masao Yamashita, Tsumoru Shintake, Shuichi Shoji, Jun Mizuno  
Waseda University, Japan, SHUTECH Co., Ltd, Japan, Okinawa Institute of Science and Technology Graduate University, Japan  
[1194]

**THERMAL REACTIVE ION ETCHING OF TI, TA, MO AND NB WITH SF6 PLASMA**

Gang Han, Yuki Murata, Yuto Minami, Masayuki Sohgawa, Takashi Abe  
Niigata University, Japan  
[1044]

**SPUTTER-DEPOSITED TiO<sub>2</sub> THIN FILMS WITH IMMOBILIZED LACTATE DEHYDROGENASE FOR POTENTIOMETRIC LACTATE SENSING**

Taizo Kobayashi, Satoshi Konishi  
Ritsumeikan University, Japan  
[1026]

**Tuesday, 28 June 2016**

**14:45-16:15**

**Session 5b Functional Materials**

**FLEXIBLE HEATING ELEMENT BASED ON GRAPHENE FOAM/POLY-DIMETHYLSILOXANE COMPOSITE**

Kata Jaruwongrungrsee, Thitima M. Daniels, Ditsayut Phokharatkul, Adisorn Tuantranont, Anurat Wisitsoraat  
National Electronics and Computer Technology Center (NECTEC), Thailand  
[1033]

**EDGE-CLAMPED GRAPHENE DIAPHRAGM WITH NANO CAVITY USING DRY TRANSFER TECHNIQUE**

Hayato Ishida, Kazuaki Sawada, Makoto Ishida, Kazuhiro Takahashi  
Toyohashi University of Technology, Japan  
[1185]

**SOLVOTHERMAL ASSISTED REDUCED GRAPHENE OXIDE MODIFIED BISMUTH ELECTRODE FOR ELECTROCHEMICAL HEAVY METAL IONS SENSOR APPLICATIONS**

Xing Xuan, MD. Faruk Hossain, Jae Y. Park  
Kwangwoon University, Republic of Korea  
[1148]

**FREESTANDING COMPRESSIVE STRESS SiO<sub>2</sub> OPTICAL WINDOW**

Nguyen Van Toan, Suguru Sangu, Takahito Ono  
Tohoku University, Japan, Core Technology Research & Development Center Ricoh Institute of Future Technology, Japan  
[1036]

**SUPERHYDROPHOBIC, SELF-CLEANING AND ANTI-BACTERIAL MULTIFUNCTIONAL SURFACES MEDIATED BY BIOMIMETIC THREE-DIMENSION SHARK-SKIN STRUCTURES**

Min Sheng Suen, Rongshun Chen  
National Tsing Hua University  
[1301]

**Tuesday, 28 June 2016**

**14:45-16:15**

**Session 5c Thermal and Liquid Phase Sensors**

**MICRODEVICE FOR COULOMETRIC DETERMINATION OF PROTEINS COUPLED WITH METALLIZATION**

Isa Anshori, Masatoshi Yokokawa, Hiroaki Suzuki  
University of Tsukuba, Japan  
[1023]

**MICRO SEPARATION COLUMNS WITH NOVEL ELECTROLESS PLATED GOLD HEATER FOR GAS CHROMATOGRAPHY SYSTEM**

Po-Shin Chen, Chun-Yen Kuo, Kuan-Ju Chiu, Yi-Hsuan Chen, Wei-I Chiu, Chia-Jung Lu, Wei-Cheng Tian  
National Taiwan University, Taiwan  
[1073]

**MICRO THERMOCOUPLE CALORIMETRIC BIOSENSOR FOR MULTIFUNCTIONAL CATALYZED REACTION**

Zhuqing Wang, Mitsutera Kimura, Takahito Ono  
Tohoku Gakuin University, Japan, Tohoku University, Japan  
[1122]

**LEAD DETECTION USING POLYMER-BASED ELECTROCHEMICAL SENSOR MODIFIED WITH BISMUTH NANOPARTICLES**

Nan Wang  
Nanyang Technological University, Singapore  
[1151]

**STUDY OF SWEETNESS SENSOR FOR HIGH-POTENCY SWEETENERS AND PREDICTION OF BITTERNESS SUPPRESSION EFFECT OF HIGH-POTENCY SWEETENERS USING TASTE SENSOR**

Hideya Onitake, Xiao Wu, Yusuke Tahara, Rui Yatabe, Kiyoshi Toko  
Kyushu University, Japan  
[1181]

**DEVELOPMENT OF SALTINESS SENSOR THAT COMPRISES ION-SELECTIVE MEMBRANE AND LIPID/POLYMER MEMBRANE**

Yuki Muto, Yusuke Tahara, Rui Yatabe, Kiyoshi Toko, Hidekazu Ikezaki  
Kyushu University, Japan, Intelligent Sensor Technology, Inc., Japan  
[1190]

**Tuesday, 28 June 2016**

**14:45-16:15**

**Session 5d Matrix Devices**

**CMOS ACTIVE PIXEL SENSOR WITH IN-PIXEL APERTURE FOR 3D IMAGING TECHNOLOGY**

young-Soo Choi, Myunghan Bae, Sang-Hwan Kim, Seunghyuk Chang, JongHo Park, Sang-Jin Lee, Seong Ho Kong, Jang-Kyoo Shin  
Kyungpook National University, Republic of Korea, Center for Integrated Smart Sensors (CISS), Republic of Korea  
[1183]

**A DESIGN OF CMOS-MEMS MULTISPECTRAL INFRARED EMITTER ARRAYS WITH METAMATERIAL ABSORBERS**

Zhengxi Cheng, Hiroshi Toshiyoshi  
Research Center for Advanced Science and Technology, The University of Tokyo, Japan, Institute of Industrial Science, The University of Tokyo, Japan, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China  
[1125]

**MEMS MICROCANTILEVER - A PERFECT COMPLEMENT TO TERAHERTZ METAMATERIAL**

Prakash Pitchappa, Chong Pei Ho, Chengkuo Lee  
National University of Singapore, Singapore  
[1139]

**PIN DISPLAY MECHANISM USING SMA WIRE**

Daniel A Heideman, Tadao Matsunaga, Takumi Kobayashi, Yoichi Haga  
University of California, San Diego, United States, Tohoku University, Japan  
[1205]

**DESIGN OF TRANSIMPEDANCE AMPLIFIER FOR SILICON WHISKER NEUROPROBE**

Xian Long Angela Leong, Ippei Akita, Hiroki Makino, Hirohito Sawahata, Makoto Ishida, Takeshi Kawano  
Toyohashi University of Technology, Japan, Electronics Inspired Interdisciplinary Research Institute (EIIRIS), Japan  
[1167]

**ON-CHIP ELECTROCHROMIC MICRO DISPLAY DEVICE USING PANI FOR DISPOSAL BIO-SENSOR CHIP**

Yanjun Zhu, Takashiro Tsukamoto, Shuji Tanaka  
Tohoku University, Japan  
[1072]

**Tuesday, 28 June 2016**

**17:00-18:30**

**Industry Session**

**Moderator**

**Hiroyuki Fujita**

**The University of Tokyo, Japan**

**Nobuaki Kawahara**

**DENSO Corporation, Japan**

**NOVEL SINGLE CHIP PROCESS WITH EMBEDDED CAVITY TO ACHIEVE WIDE RANGE VACUUM FOR SENSORS INTEGRATION**

C.W Cheng, C.W Cheng, K.C Liang, C.H Chu, D. A Horsley, Weileun Fang

Taiwan Semiconductor Manufacturing Company (TSMC) Ltd., Taiwan, National Tsing Hua University, Taiwan, University of California, United States

[1145]

**A SOFT ELECTRET GEL FOR LOW FREQUENCY VIBRATIONAL ENERGY HARVESTERS**

Hiroyuki Mitsuya, Shimpei Ono, Kazumoto Miwa, Chikako Sano, Manabu Ataka, Hiroshi Toshiyoshi, Hiroyuki Fujita

Saginomiya Seisakusho ,INC, Japan, Central Research Institute of Electric Power Industry, Japan, The University of Tokyo, Japan

[1179]

**OPTICAL MEMS MULTISENSOR FOR REMOTE SENSING IN HARSH ENVIRONMENTS**

Maurizio Tormen, Branislav Timotijevic, Yves Pétremand, Markus Lüzelschwab, Dara Zaman Bayat

CSEM, Switzerland

[1013]

**Wednesday, 29 June 2016**

**9:00-11:00**

**Session 6a Power MEMS**

**ELECTROSTATIC ENERGY HARVESTER USING BIPOLAR CHARGED ELECTRET AND DOUBLE DENSITY COUNTER ELECTRODES**

Naoki Miwatani, Keidai Minami, Takayuki Fujita, Kesuke Kanda, Kazusuke Maenaka

University of Hyogo, Japan

[1081]

**VIBRATION ELECTRET ENERGY HARVESTER WITH TUNABLE ELECTRODE GAP**

Qianyan Fu, Yuji Suzuki

The University of Tokyo, Japan

[1100]

**EFFECT OF ASYMMETRIC STRUCTURES ON OUTPUT ENHANCEMENT IN ELECTROMAGNETIC ENERGY HARVESTERS FABRICATED BY RIGID-FLEX PCB TECHNOLOGY**

Yi Chiu, Hao-Chiao Hong, Wei-Hung Hsu

National Chiao Tung University, Taiwan, Industrial Technology Research Institute, Taiwan

[1110]

**PULL-IN PREVENTION METHOD USING NDFEB THIN-FILM MAGNET FOR ELECTROSTATIC ENERGY HARVESTER**

Shinichi Yoshii, Kohei Yamaguchi, Takayuki Fujita, Kensuke Kanda, Kazusuke Maenaka

University of Hyogo, Japan

[1138]

**WAVE ROTOR TOPPING CYCLE FOR MEMS GAS TURBINE ENGINE**

Shinya Kumagai, Ryoma Suzuki, Toshiyuki Toriyama  
Ritsumeikan University, Japan  
[1061]

**STUDY ON AERODYNAMIC EXPERIMENT OF MICROSCALE SUPERSONIC WIND TUNNEL**

Ryoto Yamamoto, Daiki Ueda, Toshiyuki Toriyama  
Ritsumeikan University, Japan  
[1059]

**ADAPTING OF SERIAL AND PARALLEL COMPLEX PLANAR STACK STRUCTURE TO MICROFLUIDIC FUEL CELL**

Ki-Won Oh, Cheolhee Lee, Do-gyun Jung, Hyeong-Min Cho, Yoomin Ahn  
Hanyang University, Republic of Korea  
[1057]

**Wednesday, 29 June 2016**

**9:00-11:00**

**Session 6b Cantilever Devices / Resonators**

**FABRICATION OF MICRO-CHANNEL AND NOZZLE IN NARROW-GAPPED AFM DUAL SI PROBE**

Yoshitaka Miura, Jin-seo Hong, Kazuki Mishina, Takayuki Shibata, Takashi Mineta  
Yamagata University, Japan, Toyohashi University of Technology, Japan  
[1196]

**A NI-B MEMS PROBE TIP FOR A FINE PITCH TEST WITH ADVANCED MECHANICAL PROPERTIES**

Kyongtae Kim, Hye-Rin Ahn, Hong-Bum Gwon, Jae-Youn Do, Sung-ho Joo, Yong-Jun Kim  
Yonsei University, Republic of Korea, Samsung Electronics, Republic of Korea  
[1066]

**FABRICATION AND CHARACTERIZATION OF GRAPHENE-CU COMPOSITE MICROSTRUCTURES SYNTHESIZED BY ELECTROPLATING**

Zhonglie An, Jinhua Li, Takahito Ono  
Tohoku University, Japan  
[1038]

**STRESS EVALUATION OF SOL-GEL DERIVED PZT FILMS CALCINED AT VARIOUS TEMPERATURES ON MEMS DIAPHRAGMS AND WAFERS FOR HIGHLY SENSITIVE MICROSENSOR STRUCTURES**

Kaoru Yamashita, Jo Shiomi, Taiki Nishiumi, Minoru Noda  
Kyoto Institute of Technology, Japan  
[1130]

**MEMS MAGNETIC SENSOR WITH BRIDGE-TYPE RESONATOR AND MAGNETO-STRICTIVE THIN FILM**

Takashi Sasabuchi, Naoki Okada, Kunihiro Koike, Takashi Mineta  
Yamagata University, Japan  
[1197]

**CAPACITIVE SILICON RESONATOR WITH THERMOELECTRICAL ACTUATORS**

VAN NHA NGUYEN, VAN TOAN NGUYEN, TAKAHITO ONO  
Tohoku University, Japan  
[1042]

**MEMS ARCH RESONATOR FOR DYNAMIC MECHANICAL MEMORY USING ELECTROTHERMAL FREQUENCY MODULATION**

Md Abdullah Al Hafiz, Lakshmoji Kosuru, Hossein Fariborzi, Mohammad Ibrahim Younis  
King Abdullah University of Science and Technology (KAUST), Saudi Arabia  
[1200]

**Wednesday, 29 June 2016**

**9:00-11:00**

**Session 6c Medical Devices**

**A 32-CHANNEL FOCUSED ULTRASOUND STIMULATOR USING PHASED ARRAY MEMS TRANSDUCERS FOR ACCURATE TARGETING IN NEURO-MUSCULAR REHABILITATION SYSTEM**

Sungjin Oh, Hyungmin Kim, Inchan Youn  
Korea Institute of Science and Technology, Republic of Korea  
[1002]

**RESPIRATORY SENSOR MEASURING CAPACITANCE CONSTRUCTED ACROSS SKIN ALLOWING EXERCISE**

Momoko Karita, Makie Terazawa, Shinya Kumagai, Minoru Sasaki  
Toyota Technological Institute, Japan  
[1103]

**IMPULSE-DRIVEN CAPSULE FOR MEDICAL TREATMENT**

Takahiro Ito, Sunao Murakami, Teru Hayashi  
Kyushu Institute of Technology, Japan, Ogasawara Precision Laboratory Ltd., Japan  
[1107]

**RESPONSE TIME SHORTENING IN THERMAL CATHETER FLOW SENSOR**

Shun Watanabe, Yoshihiro Hasegawa, Miyoko Matsushima, Tsutomu Kawabe, Mitsuhiro Shikida  
Hiroshima City University, Japan, Nagoya University, Japan  
[1114]

**INSERTION OF TIP-SEPARABLE MICRONEEDLE DEVICE FOR TRANS-DERMAL DRUG DELIVERY SYSTEMS**

Yuki Nabekura, Kodai Imaeda, Yoshihiro Hasegawa, Mitsuhiro Shikida  
Hiroshima City University, Japan, Nagoya University, Japan  
[1115]

**FABRICATION OF 3D-ELECTRODE AS INJECTOR OF REAGENT-LADEN BUBBLES**

Takuya Kambayashi, Yoko Yamanishi  
Shibaura Institute of Technology, Japan  
[1120]

**EMBEDDED SENSOR PACKAGING ON ENDOSCOPY HOOD FOR REAL TIME MONITORING DURING NATURAL ORFICE TRANSLUMENAL ENDOSCOPIC SURGERY**

Tomoaki Nakagawa, Yusaku Maeda, Kouhei Maeda, Kazuki Watatani, Hideki Kobara, Hirohito Mori, Hidekuni Takao  
Kagawa University, Japan, JST-CREST, Japan  
[1152]

**DIGITIZED MICROFLUIDIC FILLING FLOW GENERATION BY SOLENOID VALVE CONTROL**

Junghyo Yoon, Eundoo Lee, Jaeho Kim, Sewoon Han, Seok Chung  
Korea University, Republic of Korea, University of California, Berkeley, United States  
[1202]

# APCOT 2016 POSTERS

Posters denoted with M are to be presented on Monday

Posters denoted with T are to be presented on Tuesday

## Theory, Design, Analysis, and Simulation

- M.1 THE STUDY OF THE MICROLENS ARRAY USED FOR BEAM HOMOGENIZATION**  
Axiu Cao, Hui Pang, Jiazhou Wang, Man Zhang, Xin Liu, Lifang Shi, Qiling Deng  
Institute of Optics and Electronics, Chinese Academy of Sciences, China  
[1051]
- T.2 DESIGN AND SIMULATION OF ELECTROSTATIC COMB-DRIVE MEMS RELAYS WITH TILTED BEAMS**  
Yue Jin, Li-Feng Wang, Qing-an Huang  
Southeast University, China  
[1063]
- M.3 A NOVEL STRUCTURE OF WAFER LEVEL PACKAGING WITH THROUGH SILICON VIA FOR THERMAL WIND SENSOR**  
Shi-Xuan Gao, Qing-An Huang, Min Qin  
Southeast University, China  
[1065]
- T.4 DESIGN OF MICROHEATER FOR FAST VOC GAS DESORPTION IN A MICROPRECONCENTRATOR**  
Koji Oyama, Hisanori Sagasaki, Masashi Iwata, Tomoaki Kageyama, Hidetoshi Miyashita, Sang-Seok Lee  
Tottori University, Japan  
[1126]
- M.5 IMPROVED LASER INTERFERENCE LITHOGRAPHY SYSTEM BY VIBRATION ANALYSIS MODEL**  
Te-Hsun Lin, Yin-Kuang Yang, Chien-Chung Fu  
National Tsing Hua University of Hsinchu, Taiwan  
[1149]
- T.6 YIELD ENHANCEMENT AND PERFORMANCE PREDICTIONS OF MEMS DEVICES CONSIDERING PROCESS VARIATIONS**  
Lili Gao  
Southeast University, China  
[1199]

## Material, Fabrication, and Packaging Technologies

- M.7 THE FABRICATION TECHNIQUE OF STRUCTURE WITH 3D PROFILE BY ONE TIME EXPOSURE**  
Lifang Shi, Axiu Cao, Jiazhou Wang, Qiling Deng, Hui Pang, Man Zhang, Xin Liu  
Institute of Optics and Electronics, Chinese Academy of Science, China  
[1046]
- T.8 THE DESIGN AND FABRICATION TECHNIQUE OF DIFFRACTIVE OPTICAL ELEMENTS**  
Qiling Deng, Lifang Shi, Hui Pang, Man Zhang, Axiu Cao, Jiazhou Wang, Xin Liu  
Institute of Optics and Electronics, China  
[1048]

- M.9 FABRICATION OF SEALED NANO-CHANNELS BASED ON SACRIFICIAL NANOTEMPLATES BY FOCUSED-ION-BEAM INDUCED CHEMICAL VAPOR DEPOSITION**  
Lin Jin, Ajuan Cui, Aizi Jin, Wuxia Li, Junjie Li, Changzhi Gu  
Institute of Physics, Chinese Academy of Sciences, China, Collaborative Innovation Center of Quantum Matter, China  
[1077]
- T.10 NITROGEN VACANCY CENTER EMBEDDED DIAMOND NANOSTRUTURES AND THE TEMPERATURE DEPENDENT OPTICAL PROPERTIES**  
Qianqing Jiang, Wuxia Li, Aizi Jin, Junjie Li, Changzhi Gu  
Institute of Physics, Chinese Academy of Sciences, China, Collaborative Innovation Center of Quantum Matter, China  
[1078]
- M.11 THE INFLUENCE OF PLASMA CONDITIONS ON SURFACE-ACTIVATION THAT AFFECT THE BONDED AREA**  
Sethavut Duangchan, Ryouya Shirahama, Tomoki Murayama, Soushi Hamada, Akiyoshi Baba  
Kyushu Institute of Technology, Japan  
[1105]
- T.12 A NEW PROCESSING TECHNIQUE FOR ULTRA-THIN WAFER**  
Yibo Zeng, Hang Guo  
Xiamen University, China  
[1136]
- M.13 BOTTOM-UP METHOD TO SYNTHESIZED CARBON DOTS / ZNO NANORODS AS PROMISING OPTOELECTRONIC MATERIALS FOR HYBRID ULTRAVIOLET (UV) PHOTODETECTOR.**  
Kyung Jae Choi, Sang Won Lee, Jae Sung Lee, Sae Wan Kim, Sang Hyup Kim, Jun Woo Lee, Shin Won Kang  
Kyungpook National University, Republic of Korea  
[1144]
- T.14 IMPLEMENTATION OF MICRO 3D GRAYSCALE FABRICATION TECHNIQUE FOR OPTOFLUIDIC DEVICE APPLICATION**  
Intan S.L. Abdul Hamid, Asrulnizam Abd Manaf  
Universiti Sains Malaysia, Malaysia, Universiti Tun Hussein Onn Malaysia, Malaysia  
[1157]
- M.15 ALL SOLUTION PROCESSIBLE NONVOLATILE MEMORY BY CDSE/ZNS QUANTUM DOT AND PENTACENE INTERFACE**  
Sae-Wan Kim, Jin-Beom Kwon, In-Su Jung, Sang-Won Lee, Jae-Sung Lee, Hyun-Min Jeong, Jun-Woo Lee, Shin-Won Kang  
Kyungpook National University, College of IT Engineering, Republic of Korea  
[1160]
- Physical Sensors and Microsystems**
- T.16 A TUNABLE MICRO BISTABLE MECHANISM**  
Han Du, Fook Siong Chau, Guangya Zhou  
National University of Singapore, Singapore  
[1043]
- M.17 SIC DIAPHRAGMS FABRICATED BY AN ULTRASONIC VIBRATION MILL-GRINDING METHOD FOR HIGH-TEMPERATURE FIBER-OPTIC PRESSURE SENSORS**  
Yonggang Jiang, Zhiwen Zhou, Jian Li, Rui Wang, Deyuan Zhang  
Beihang University, China  
[1045]
- T.18 FABRICATION OF THREAD TYPE TEMPERATURE SENSOR FOR WEARABLE DEVICES**  
Jiwon Kye, Dong-Cheul Han, Han-Jae Shin, Wanghoon Lee  
Gumi Electronics and Information Technology Research Institute, Republic of Korea, Andong National University, Republic of Korea  
[1071]

**M.19 A NOVEL MEMS INERTIAL SENSOR WITH OUT-OF-PLANE DIFFERENTIAL SENSING STRUCTURE BY MULTI-LAYER METAL TECHNOLOGY**

Daisuke Yamane, Toshifumi Konishi, Teruaki Safu, Hiroyuki Ito, Hiroshi Toshiyoshi, Kazuya Masu, Katsuyuki Machida  
Tokyo Institute of Technology, Japan, Japan Science and Technology Agency CREST, Japan, NTT Advanced Technology Corporation, Japan, The University of Tokyo, Japan  
[1099]

**T.20 SMOOTH SURFACED SHEAR STRESS SENSOR WITH HIGH TIME RESOLUTION**

Chiaki Okihara, Yoshihiro Hasegawa, Mitsuhiro Shikida  
Hiroshima City University, Japan  
[1116]

**M.21 STUDY OF DIFFERENT GEOMETRIC DUAL-COIL AFFECTING ELECTROMAGNETIC SENSING PERFORMANCE**

Siansyun Liao, Kenwei Tang, Hsiuwei Lin, Weichen Li, Chingfu Tsou  
Feng Chia University, Taiwan  
[1143]

**T.22 STRUCTURAL INVESTIGATION OF PIEZOELECTRIC LAYER AND ELECTRODE LAYER FOR CIRCULAR PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS**

Daisuke Akai, Hongqu Yu, Takeo Kaotori, Makoto Ishida  
Toyohashi University of Technology, Japan  
[1150]

**M.23 REDUCTION OF KNEE POINT VARIATION IN LOGARITHMIC RESPONSE OF LINEAR-LOGARITHMIC CMOS IMAGE SENSOR**

Myunghan Bae, Byoung-Soo Choi, Sanggwon Lee, Sang-Hwan Kim, Sang-Ho Seo, Pyung Choi, Jang-Kyoo Shin  
Kyungpook National University, Republic of Korea  
[1162]

**T.24 BULK-MICROMACHINED SILICON STRAIN GAUGES FOR HYDROGEN PRESSURE SENSORS**

Jinwoong Kim, Kibeom Kim, Jonghyun Kim, Namho Bae, Namki Min  
Korea University, Republic of Korea, National Nanofab Center, Republic of Korea  
[1170]

**M.25 SILICON-GLASS WAFER BASED SILICON STRAIN GAUGES WITH HIGH WITHSTANDING VOLTAGES**

Kibeom Kim, Jinwoong Kim, Jonghyun Kim, Chanwon Park, Namho Bae, Namki Min  
Korea University, Republic of Korea, Kangwon University, Republic of Korea, National Nanofab Center, Republic of Korea  
[1180]

**T.26 IMPLANTABLE WIRELESS PASSIVE INTRACRANIAL PRESSURE MONITORING SYSTEM**

Xiuxu Wei, Junbo Wang, Deyong Chen, Jian Chen, Ming Zhao  
State Key Laboratory of Transducer Technology, Institute of Electronics, Chinese Academy of Sciences, China, First Affiliated Hospital of Chinese PLA General Hospital, China  
[1192]

## **Chemical Sensors and Microsystems**

**M.27 HIGHLY SENSITIVE ELECTROCHEMICAL DETERMINATION OF TRACE-LEVEL CADMIUM BASED ON GRAPHENE/L-CYSTEINE/AU, GLASS CARBON AND BORON-DOPED DIAMOND ELECTRODE**

Yu Song, Chao Bian, Jianhua Tong, Yang Li, Shanhong Xia  
University of Chinese Academy of Sciences, China, Institute of Electronics, Chinese Academy of Sciences, China  
[1015]

- T.28 DEVELOPMENT OF A PULSE INPUT TYPE POTASSIUM SENSOR FOR MONITORING NUTRIENT CONCENTRATION IN AGRICULTURE**  
Masato Futagawa, Takaya Ozawa, Harutoyo Hirano, Tiejun Zhao, Akimasa Nakano, Kazuaki Sawada  
Shizuoka University, Japan, National Agriculture and Food Research Organization, Japan, Toyohashi University of Technology, Japan  
[1034]
- M.29 NANO GRAINED GRAPHENE CHEMICAL SENSOR FOR DETECTION OF NOX AT MILD TEMPERATURE**  
ChengChun Tang, HaiFang Yang, JunJie Li, ChangZhi Gu  
Institution of Physics, Chinese Academy of Sciences, China  
[1050]
- T.30 GAS-SENSING STUDIES OF WO<sub>3</sub> AND WS<sub>2</sub> NANOTUBES PREPARED BY THERMAL OXIDATION AND FLUIDIZED BED REACTION**  
Anurat Wisitsoraat, Ditsayuth Phokaratkul, Kata Jaruwongrungrsee, Thitima M. Daniels, Adisorn Tuantranont, Wojtek Wlodarski  
National Electronics and Computer Technology Center, Thailand, RMIT University, Australia  
[1087]
- M.31 3D GRAPHENE-PDMS-CNT BASED ELECTROCHEMICAL SENSORS FOR DETECTION OF HEAVY METAL**  
Thitima M. Daniels  
National Electronics and Computer Technology Center, Thailand  
[1093]

## **Bio/Biomedical Sensors and Microsystems**

- T.32 EFFECT OF BUFFERING ACTION ON THE OUTPUT RESPONSE OF ENZYME FUNCTIONALIZED POTENTIOMETRIC SENSOR ARRAYS FOR ATP IMAGING**  
Hideo Doi, Tomoko Horio, Tatsuya Iwata, Koichi Okumura, Toshiaki Hattori, Kazuhiro Takahashi, Yuji Murakami, Makoto Ishida, Kazuaki Sawada  
Toyohashi University of technology, Japan  
[1010]
- M.33 DEVELOPMENT OF ANTIBODY-ADSORPTION BASED SANDWICH ASSAYS FOR DETECTING TUBERCULOSIS SECRETORY ANTIGENS ONTO THE NANOMATERIALS**  
Eun Bee Kim, Seon-Ah Cheon, Jaebeom Lee, Hwa-Jung Kim, Tae Jung Park  
Chung-Ang University, Republic of Korea, Busan National University, Republic of Korea, Chungnam National University, Republic of Korea  
[1035]
- T.34 FLEXIBLE AND RESIZABLE CAPACITIVE PRESSURE SENSOR FOR BREATHING SIGNAL MONITORING APPLICATIONS**  
Seong-Won Park, Partha Sarati Das, Hee-Uk Lee, Jae-Yeong Park  
Kwangwoon University, Republic of Korea  
[1064]
- M.35 FABRICATION OF IR/IROX MICRO PH SENSOR FOR QUANTITATIVE DENTAL CARIES EVALUATION**  
Chindanai Ratanaporncharoen, Miyuki Tabata, Yuichi Kitasako, Masaomi Ikeda, Junji Tagami, Tatsuro Goda, Akira Matsumoto, Yuji Miyahara  
Tokyo Medical and Dental University, Japan  
[1076]
- T.36 CHIP HOLDER FOR ON-CHIP ION SOURCE MASS SPECTROMETRY**  
Xi Luo, Trong Tue Phan, Kiyotaka Sugiyama, Yuzuru Takamura  
Japan Advanced Institute of Science and Technology, Japan  
[1092]

- M.37 SIDE-POLISHED FIBER SPR SENSOR FOR CONTINUOUS GLUCOSE MONITORING**  
Bingyu Lu, Yanwen Sun, Xiaochen Lai, Haixia Yu, Dachao Li  
Tianjin University, China  
[1095]
- T.38 THE EFFECT OF ELECTRICAL PROPERTY OF PHOSPHOLIPID LAYER ON THE ELECTROFORMATION OF GIANT VESICLES**  
Yuying Chiang, Chingfu Tsou  
Feng Chia University, Taiwan  
[1147]
- M.39 L-ASCORBIC ACID SUPPRESSES  $\beta$ -LACTOGLOBULIN AMYLOID FIBRILLATION**  
Wonseok Lee, Hyungbeen Lee, Insu Kim, Sang Won Lee, Sang Woo Lee, Dae Sung Yoon  
Yonsei University, Republic of Korea, Korea University, Republic of Korea  
[1165]
- T.40 CHARACTERIZATION OF TRAP STIFFNESS OF MULTIPLE PARTICLES IN DIELECTROPHORETIC TWEEZERS**  
Seungyeop Choi, Myeonggu Son, Kwan Hwi Ko, Min Hyung Kim, In Soo Park, Sang Woo Lee  
Yonsei University, Republic of Korea  
[1166]
- M.41 MICROCHAMBER ARRAY FOR FREQUENCY-DEPENDENT SINGLE-CELL IMPEDANCE MONITORING**  
YoonHee Chang, Jiyeon Bu, Young-Ho Cho  
Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea  
[1172]
- T.42 MICROFLUIDIC PLATFORMS FOR MACRO-SCALE TISSUE FORMATION**  
Hyo Eun Jeong, Yuta Kubota, Yun Jung Heo, Seok Chung  
Korea University, Republic of Korea, Tokyo University of Agriculture and Technology, Japan  
[1201]

## Medical Devices and Microsystems

- M.43 DEVELOPMENT OF AN IMAGE SENSOR FOR ROOT CANAL**  
Masataka Fujimoto, Shinji Yoshii, Satoshi Ikezawa, Toshitsugu Ueda, Chiaki Kitamura  
Kyushu Dental University, Japan, Waseda University, Japan  
[1037]
- T.44 FABRICATION OF LOW-TEMPERATURE SOLUTION-PROCESSED THIN-FILM LEAD ZIRCONIUM TITANATE ACTUATOR FOR HIGHLY INTEGRATED BIOCHIP**  
Reijiro Shimura, Phan Trong Tue, Yuuki Tagashira, Yoshiaki Ukita, Tatsuya Shimoda, Yuzuru Takamura  
Japan Advanced Institute of Science and Technology, Japan, University of Yamanashi, Japan, JST-CREST, Japan  
[1088]
- M.45 HIGH-THROUGHPUT VIABLE CIRCULATING TUMOR CELL ISOLATION USING FABRIC MEMBRANE FILTERS**  
Jiyeon Bu, Jeongsuk Kim, Young-Ho Cho  
Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea, Se Hong Trading, Republic of Korea  
[1168]
- T.46 DEVELOPMENT OF ATTACHABLE POLYIMIDE THIN FILM WITH ELECTRICAL IMPEDANCE SENSOR FOR TISSUE DISCRIMINATION**  
Jaeho Park, Inkyu Park  
Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea  
[1184]

## **Micro/Nano Fluidics**

- M.47 THERMAL PERFORMANCE ANALYSIS OF MICRO PILLARS AND CHANNELS UNDER BOILING AND DRY-OUT PHENOMENA**  
Shao-Wen Chen, Min-Lun Chai, Feng-Jiun Kuo, Fang-Chin Liu, Wei-Keng Lin, Jong-Rong Wang, Jin-Der Lee, Hao-Tzu Lin, Chunkuan Shih  
National Tsing Hua University, Taiwan, Nuclear and New Energy Education and Research Foundation, Taiwan, Institute of Nuclear Energy Research, Taiwan  
[1003]
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