Technical Program

All indicated times in the program are Eastern Standard Time (EST)

The Executive Committee reserves the right to amend the program if necessary.

Sunday, 29 June

All times are Eastern Standard Time (EST)

Special Event - Future Visions for Transducers Part 1

09:00 – 12:00

Poster Session and Workshop

MEMS Industry Session

13:00 – 16:30

Welcome Reception

17:00 – 19:00

Monday, 30 June

All times are Eastern Standard Time (EST)

Welcome Address and Technical Program Introduction

08:30 – 09:00

TRF President
Reza Ghodssi, *University of Maryland, USA*

Conference Chair:
Jack Judy, *University of Florida, USA*

Executive Program Chair:
Ellis Meng, *University of Southern California, USA*

Plenary Presentation 1

Windemere W - X

09:00 - 09:45

M1A.P1 THE REVOLUTION OF SILICON PHOTONICS
Michal Lipson
Columbia University, USA

Plenary Presentation 2

Windemere W - X

09:45 - 10:30

M1A.P2a **IN VIVO-MANUFACTURED ORGANIC BIOELECTRONICS FOR NEUROLOGICAL APPLICATIONS**
Magnus Berggren
Linköping University, SWEDEN

10:30 - 11:00 **Break and Exhibit Inspection**

Plenary Presentation 3

Windemere W - X

11:00 - 11:45

M1A.P3 **FROM FLOW CYTOMETRY TO FLOW ZOOMETRY: A PARADIGM SHIFT IN HIGH-THROUGHPUT SCREENING**
Keisuke Goda
University of Tokyo, JAPAN

2025 Transducers Early Career Award Presentation

11:45 - 12:00

Transducers 2027 Announcement

12:00 - 12:15

12:15 - 14:00 **Lunch and Exhibit Inspection**

Poster Session M3P and Exhibit Inspection

Regency S – V & Rotunda

14:00 - 16:00

Poster presentations are listed by topic category with their assigned number starting on page 30.

Session M4A - Functional Materials

Windemere W

16:00 - 16:15

M4A.01 SILVER NANOWIRE-PATTERNED, FREEZE-CASTED PVDF AEROGELS FOR SIMULTANEOUS PASSIVE RADIATIVE COOLING AND AIRFLOW SENSING
Hyeyoung Lee[1], Donghyun Lee[1], Beom Soo Joo[2], Gumin Kang[2], and Jungwook Choi[1]
[1]Chung-Ang University, KOREA and [2]Korea Institute of Science and Technology, KOREA

16:15 - 16:30

M4A.02 MELAMINE-DERIVED CARBON NITRIDE-FUNCTIONALIZED POLYURETHANE NANOMESH-BASED TRIBOELECTRIC NANOGENERATOR FOR SELF-POWERED RESPIRATION MONITORNING
M.Robiul Islam, Omar Faruk, Md Selim Reza, Md Shofiul Alam, Seungjae Lim, Trilochan Bhatta, and Jae Yeong Park
Kwangwoon University, KOREA

16:30 - 16:45

M4A.03 LOW-VOLTAGE ELECTROMECHANICAL SWITCHING BASED ON LOW DIMENSIONAL MATERIALS
Tong Dang[1], Jinchi Han[2], Zhien Wang[1], Zhangqi Zheng[1], Jing Kong[1], Jeffrey H. Lang[1], and Vladimir Bulovic[1]
[1]Massachusetts Institute of Technology, USA and [2]Peking University, CHINA

16:45 - 17:00

M4A.04 LASER-INDUCED MXENE/PVDF NANOFIBROUS-BASED ION-SELECTIVE ELECTRODE SENSOR FOR CONTINUOUS MONITORING OF NA+ AND K+ IONS IN SWEAT
Dong Yun Kim, Md Asaduzzaman, Md Selim Reza, and Ahmad Abdus Samad
Kwangwoon University, KOREA

17:00 - 17:15

M4A.05 ENHANCED UV PHOTODETECTION ON FLEXIBLE SUBSTRATE: BACK-GATED FERROELECTRIC FIELD-EFFECT TRANSISTOR UTILIZING BARIUM TITANATE MODIFIED WITH 2D WS2 CHANNEL
Rohit Raj Padhi and Guo-Hua Feng
National Tsing Hua University, TAIWAN

17:15 - 17:30

M4A.06 GO/PYRENE BASED NANOTEXTURING SURFACE SWITCHED BY DYNAMICALLY DISPLAYING ELECTRIC FIELD
Ken Sasaki, Hisataka Maruyama, and Takayuki Hoshino
Nagoya University, JAPAN

Session M4B - PMUTs

Windemere X

16:00 - 16:15

M4B.01 A BANDWIDTH-TUNABLE ARRAY OF PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS WITH VARIOUS DC BIAS VOLTAGE COMBINATIONS
Xili Wang, Yufeng Gao, Aocheng Bao, Chenyuan Zhang, and Yipeng Lu
Peking University, CHINA

16:15 - 16:30

M4B.02 A NOVEL RECEIVE SPATIAL BEAMFORMER FOR HIGH-RESOLUTION ULTRASONIC PLANE-WAVE IMAGING USING PMUTS

Mantalena Sarafianou[1], Gaia Giubilei[1,2], David Choong[1], Duan Jian Goh[1], Yul Koh[1], Luigi Barretta[3], Madanagopal Kunnavakkam[4], Domenico Giusti[3], and Alberto Leotti[4]

[1]Institute of Microelectronics, SINGAPORE, [2]Politechnico di Torino, ITALY, 3STMicroelectronics, ITALY, and [4]STMicroelectronics, SINGAPORE

16:30 - 16:45

M4B.03 AN ULTRASONIC ACTUATOR WITH AMPLITUDE-MODULATED QUASI-MONOPOLAR PULSES BASED ON DUAL-FREQUENCY PMUT

Xinyue Zhang, Chong Yang, Junhao Wang, Jiao Xia, Lei Zhao, Chenyuan Zhang, Wei Wang, Bowen Sheng, and Yipeng Lu

Peking University, CHINA

16:45 - 17:00

M4B.04 A NOVEL MULTIMODE CHAINRING-SHAPED PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCER (PMUT) ARRAY FOR BANDWIDTH EXTENSION

Zhou Da[1,2], Tingzhong Xu[1], Jiapeng Xu[1], and Alessandro Stuart Savoia[2]

[1]Silicon Austria Labs GmbH, AUSTRIA and [2]Roma Tre University, ITALY

17:00 - 17:15

M4B.05 A PMUT-BASED OBSTACLE SENSING SYSTEM WITH ENHANCED DETECTION CAPABILITIES VIA A SYSTEM-LEVEL DEVELOPMENT PLATFORM

Laurentiu Acasandrei, Yuneisy Esthela Garcia Guzman, Chunlei Xu, Zhou Da, Rodrigo Tumolin Rocha, and Tingzhong Xu

Silicon Austria Labs GmbH, AUSTRIA

17:15 - 17:30

M4B.06 INVERSE DESIGN OF PMUT USING DEEP REINFORCEMENT LEARNING WITH A VIEW TO CUSTOMIZED OPERATING FREQUENCY AND BROADENED BANDWIDTH

Jiapeng Xu[1,2], Zhou Da[1,3], Gabriele Schrag[2], Jérémy Streque[1], and Tingzhong Xu[1]

[1]Silicon Austria Labs, AUSTRIA, [2]Technical University of Munich, GERMANY, and [3]Roma Tre University, ITALY

Session M4C - Cellular Systems I

Windemere Y

16:00 - 16:15

M4C.01 MICROFLUIDICS-GUIDED ASSEMBLY OF FLUORESCENT NANODIAMONDS FOR TEMPERATURE MAPPING OF A CELL AGGREGATE

Keita Saikawa[1], Masaya Zetsu[1], Daiki Ueshima[1], Taiichi Shikama[1], Ken-ichiro Kamei[1,2], Osamu Tabata[1], and Yoshikazu Hirai[1]

[1]Kyoto University, JAPAN and [2]New York University, Abu Dhabi, UAE

16:15 - 16:30

M4C.02 NANO-TRANSDUCERS COMPOSED OF LIPIDS VISUALIZE POPULATION DOUBLING LEVELS OF CELLS

Niko Kimura[1], Akiko Takahashi[2], and Shinya Sakuma[3]

[1]Tokyo University of Agriculture and Technology, JAPAN,
[2]Japanese Foundation for Cancer Research, JAPAN, and [3]Kyushu University, JAPAN

16:30 - 16:45

M4C.03 THE EFFECT OF MICROFABRICATED CELL ADHESION AREAS ON ULTRASOUND RESPONSE OF ION CHANNEL-TYPE RECEPTOR

Lisa Mitsuda[1], Shun Koda[1], Shigenori Miura[2], and Yuta Kurashina[1]

[1]Tokyo University of Agriculture and Technology, JAPAN and [2]Hiroshima University, JAPAN

16:45 - 17:00

M4C.04 A MICROPERFUSION SYSTEM OF PROMOETED CELL GROWTH USING NON-THERMAL ATMOSPHERIC PRESSURE PLASMA
Hayata Okino and Shinya Kumagai
Meijo University, JAPAN

17:00 - 17:15

M4C.05 HIGH CELL DENSITY CULTURED MEAT BY THE TEXTILE WEAVING OF FIBER-SHAPED BOVINE MUSCLE TISSUE
Asa Hasegawa, Kensei Okada, Byeongwook Jo, Minghao Nie, and Shoji Takeuchi
University of Tokyo, JAPAN

17:15 - 17:30

M4C.06 FORMING THREE-DIMENSIONAL CELLULAR TISSUE IN MICRO-MOLDED AGAROSE GELS USING MECHANICAL STIMULATION
Ryota Kawamae[1], Atsushi Takata[2], Kenjiro Takemura[3], and Yuta Kurashina[1]
[1]Tokyo University of Agriculture and Technology, JAPAN, [2]Institute of Science Tokyo, JAPAN, and [3]Keio University, JAPAN

Session M4D - Resonators I

Windemere Z

16:00 - 16:15

M4D.01 VLSI PIEZOELECTRIC OPTOMECHANICS FOR GHZ REFERENCE OSCILLATORS
Furcatte Thomas, Munique Kazar Mendes, Mathis Lefebvre, Aude Lefevre, Sébastien Hentz, and Marc Sansa
CEA-Leti, Université Grenoble Alpes, FRANCE

16:15 - 16:30

M4D.02 TOWARDS A VOCS SENSING ARRAY VIA BATCH-COMPATIBLE POST-CMOS THIOL FUNCTIONALIZATION ON CMOS-MEMS MONOLITHIC RESONATORS
Pedro Llinàs[1,2], Rafel Perello-Roig[1,2,3], Jaume Verd[1,2], Bartomeu Soberats[1], Salvador Barcelo[1,2], Sebastian Bota[1,2], and Jaume Segura[1,2]
[1]University of the Balearic Islands, SPAIN, [2]Health Research Institute of the Balearic Islands, SPAIN, and [3]University of Florida, USA

16:30 - 16:45

M4D.03 MAGNETIC FIELD-TUNABLE NONRECIPROCAL ACOUSTIC TRANSDUCER WITH LORENTZ FORCE INTERACTION
Daozheng Luo[1], Yuxi Wang[1,2], Xuankai Xu[1], Jiawei Li[1,2], Lihui Jin[1], and Tao Wu[1,2]
[1]ShanghaiTech University, CHINA and [2]Chinese Academy of Sciences, CHINA

16:45 - 17:00

M4D.04 SELF-FREQUENCY PUMPING FOR CHAOTIC MICROMECHANICAL FREQUENCY COMB GENERATION VIA MULTIMODAL INTERNAL RESONANCE
Ting-Yi Chen and Wei-Chang Li
National Taiwan University, TAIWAN

17:00 - 17:15

M4D.05 HEAVILY-DOPED DUAL-MODE DISTRIBUTED LAMÉ RESONATOR (DLR) FOR TEMPERATURE-COMPENSATED MEMS OSCILLATORS
Shubham Sahasrabudhe[1], Haoran Wen[2], Gregory V. Junek[2], and Farrokh Ayazi[1,2]
[1]Georgia Institute of Technology, USA and [2]StethX Microsystems Inc., USA

17:15 - 17:30

M4D.06 TEMPERATURE-COMPENSATED SELF-SENSING DIAMOND RING RESONATORS
Xintian Liu, Kevin H. Zheng, Hung-Yu Chen, and Clark T.C. Nguyen
University of California, Berkeley, USA

17:30 Adjourn for the Day

Future Visions for Transducers Part II – Panel Discussion

17:45 - 18:45

Dessert Reception in Exhibition Area

20:00 – 22:00

Tuesday, 1 July

Session T1A - Optical & Photonic Devices

Windemere W

08:30 - 09:00

INVITED PRESENTATION

T1A.01 ADVANCED NANOSTRUCTURES FOR BIOMEDICAL SENSORS, TERAHERTZ DEVICES, AND META-DEVICES
Stella Pang
City University of Hong Kong, CHINA

09:00 - 09:15

T1A.02 OPTICAL OBSERVATION OF ULTRASOUND PHENOMENA IN NANO-SIZED SPOT BY USING SPATIOTEMPORAL ANALYSIS OF RADIAL FLUORESCENCE FLUCTUATION
Ru Konno[1], Ryuto Yamakawa[1], Yasuhiko Orita[2], and Yuta Kurashina[1]
[1]Tokyo University of Agriculture and Technology, JAPAN and 2Institute of Science Tokyo, JAPAN

09:15 - 09:30

T1A.03 A DUAL CHANNEL FIBER OPTICAL SPR SENSOR FOR COMBINED DETECTION OF DIABETES AND ITS COMPLICATIONS
Jiaming Ma, Ridong Wang, Dachao Li, and Kexin Xu
Tianjin University, CHINA

09:30 - 09:45

T1A.04 AN ULTRA-LARGE ARRAY SILICON NITRIDE PHOTONIC CHIP FOR ADVANCED BIO-CHEMICAL SENSING PLATFORMS
Bo Wang, He Li, Gong Jian Cheng, Chang Chen, Zi Hui Li, and Huan Liu
Chinese Academy of Sciences, CHINA

09:45 - 10:00

T1A.05 MEMS-DRIVEN ELECTRICALLY RECONFIGURABLE PLATFORM FOR PHOTONIC QUASI-BOUND STATES IN THE CONTINUUM
Hong Zhou[1], Ting-Yi Chen[2], Zhihao Ren[1], Dongxiao Li[1], Cheng Xu[1], Chun-Pu Tsai[2], Wei-Chang Li[2], and Chengkuo Lee[1]
[1]National University of Singapore, SINGAPORE and [2]National Taiwan University, TAIWAN

Session T1B - Fabrication & Materials

Windemere X

08:30 - 09:00

INVITED PRESENTATION

T1B.01 BEYOND THE MASK: ADVANCING MICRO/NANOMANUFACTURING AND IMMERSIVE CLEANROOM LEARNING

Juergen Brugger

École Polytechnique Fédérale de Lausanne, SWITZERLAND

09:00 - 09:15

T1B.02 CONTROLLABLE ELECTRODE PRINTING ON POROUS HYDROPHOBIC FLEXIBLE SUBSTRATE FOR BREATHABLE ELECTRONICS

Zhongxu Zhou, Xingguo Zhan, Wangwang Zhu, Hao Zheng, Wenjun Li, Chenxi Jin, Youhao Liu, Dachao Li, and Zhihua Pu

Tianjin University, CHINA

09:15 - 09:30

T1B.03 CONTOUR RECOGNITION AND FEATURE EXTRACTION OF SEM CROSS-SECTIONAL PROFILES IN DEEP REACTIVE ION ETCHING BASED ON PHYSICS-CONSTRAINED VARIATIONAL LEVEL SET AUTOENCODER

Fang Wang[1], Hao Yu[1], Yechen Miao[1], Ke Sun[1], Xiaoyuan Xia[1,2], Yemin Dong[1,2], Yi Sun[1], Heng Yang[1], and Xinxin Li[1]

[1]Chinese Academy of Sciences, CHINA and [2]Shanghai Industrial Technology Research Institute, CHINA

09:30 - 09:45

T1B.04 AN IN-LINE METHOD FOR EXTRACTING AND MAPPING CD-LOSS AND SIDE-WALL ANGLE IN DRIE

Xufeng Wang, Leijian Cheng, Peng Liu, Jiakang Li, Shiyang Yuan, Xuanqing Hua, Jiawei Zhou, Yi Chen, and Dacheng Zhang

Peking University, CHINA

09:45 - 10:00

T1B.05 A NOVEL HBR-BASED HIGH SELECTIVITY NON-BOSCH DEEP SILICON ETCHING PROCESS ENHANCES MECHANICAL PERFOEMANCE FOR MEMS DEVICE

Yongquan Su[1,2], Yichen Liu[1,2], Hao Huang[1], Wanzhu Qiao[1,2,3], Xingwang Zhu[2], Lihao Wang[1], and Zhenyu Wu[1,2]

[1]Chinese Academy of Sciences, CHINA, [2]Shanghai Industrial μTechnology Research Institute, CHINA, and [3]University of Shanghai for Science and Technology, CHINA

Session T1C - DNA Devices

Windemere Y

08:30 - 09:00

INVITED PRESENTATION

T1C.01 MICROSWIMMERS THE FLEX: HOW SOFT LITHOGRAPHY AND DNA SELF-ASSEMBLY ENABLE MICROROBOT LOCOMOTION AND RESPONSIVENESS

Rebecca Taylor

Carnegie Mellon University, USA

09:00 - 09:15

T1C.02 FEMTOMOLAR DETECTION OF BIOMARKERS BY UNIVERSAL DNA-BASED PENDULUM BIOSENSOR

Songxue Chen, Xiaoping Li, Xiaoran Wang, and Dachao Li

Tianjin University, CHINA

09:15 - 09:30

T1C.03 DNA SENSOR INTEGRATED CRISPR-CAS9 AND A FOUR-ELECTRODE PROBE
Peng Zhou, Amber McElroy, Yingming Xu, Mark Osborn, and Tianhong Cui
University of Minnesota, USA

09:30 - 09:45

T1C.04 HIGH-YIELD ELECTROCHEMICAL DNA SYNTHESIS METHOD BASED ON HYBRID SUPPORT OF GOLD NANOPARTICLES AND FUNCTIONAL POLYMERS
Chunjie Sun, Haixia Yu, and Dachao Li
Tianjin University, CHINA

09:45 - 10:00

T1C.05 NOVEL HIGH-THROUGHPUT AND HIGH-CAPACITY DNA SYNTHESIS CHIP BY INKJET PRINTING AND NANOPARTICLES SELF-ASSEMBLY
Caiqin Zhao, Xiaoping Li, Duo Fu, and Dachao Li
Tianjin University, CHINA

Session T1D - Gas Sensing

Windemere Z

08:30 - 09:00

INVITED PRESENTATION

T1D.01 SMART ENVIRONMENTAL MONITORING BY LOW-POWER/SELF-POWERED GAS SENSORS AND AI
Inkyu Park
Korea Advanced Institute of Science and Technology (KAIST), Korea

09:00 - 09:15

T1D.02 HIGHLY ROBUST AND MECHANICALLY STABLE GAS SENSOR THROUGH SYMMETRICAL FIXED-GUIDED L-SHAPED BEAMS
Se-Yoon Jung[1], Sung-Ho Kim1, Min-Seung Jo[2], Beon-Jun Kim[1], Jae-Soon Yang[1], Myung-Kun Chung[1], Tae-Soo Kim[1], Yu-Hyun Shim[1], and Jun-Bo Yoon[1]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA, and [2]Northwestern University, USA

09:15 - 09:30

T1D.03 HIGHLY SENSITIVE METAL-OXIDE GAS SENSOR USING THERMAL DOPING TECHNIQUE FOR HIGH DEVICE UNIFORMITY
Sung Ho Kim[1], Se-Yoon Jung[1], Jae-Young Yoo[2], Beom-Jun Kim[1], Jae-Soon Yang[1], Tae-Soo Kim[1], Yu-Hyun Shim[1], and Jun-Bo Yoon[1]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA and
[2]Sungkyunkwan University, KOREA

09:30 - 09:45

T1D.04 MONOLITHICALLY INTEGRATED CMOS-MEMS MICROCANTILEVER GAS SENSOR WITH SUB-10 MILLIWATT POWER CONSUMPTION
Xuanqing Hua, Fengyang Li, Peng Liu, Shiyang Yuan, Xufeng Wang, Zhiheng Yu, and Dacheng Zhang
Peking University, CHINA

09:45 - 10:00

T1D.05 PHOTOACTIVATED GAS SENSORS WITH CONDUCTIVE MOF ARRAYS INTEGRATED ON MICRO-LED PLATFORMS
Kichul Lee[1], Young-Moo Jo[2], Myung Sung Sohn[2], Mingyu Jeon[1], Jihan Kim[1], Yun Chan Kang[2], and Inkyu Park[1]
[1]Korea Advanced Institute Of Science And Technology (KAIST), KOREA and [2]Korea University, KOREA

10:00 - 10:30 **Break and Exhibition Inspection**

Session T2A - Resonators II

Windemere W

10:30 - 10:45

T2A.01 KU-BAND ALSCN-ON-DIAMOND SAW RESONATORS WITH PHASE VELOCITY ABOVE 8600 M/S

Tzu-Hsuan Hsu[1], Kapil Saha[2], Jack Kramer[1], Omar Barrera[1], Pietro Simeoni[2], Matteo Rinaldi[2], and Ruochen Lu[1]

[1]University of Texas, Austin, USA and [2]Northeastern University, USA

10:45 - 11:00

T2A.02 SURFACE ACOUSTIC WAVE PHYSICAL RESERVOIR COMPUTER USING THERMOACOUSTIC PHASE MODULATOR

Taiki Ijima[1], Claude Meffan[1,2], Masaki Shimofuri[1], Amit Banerjee[1], Jun Hirotani[1], and Toshiyuki Tsuchiya[1]

[1]Kyoto University, JAPAN and [2]University of Canterbury, NEW ZEALAND

11:00 - 11:15

T2A.03 VISUALIZATION OF DENSE SPURIOUS MODES IN A 5 GHZ LATERALLY EXCITED BULK ACOUSTIC RESONATOR USING PULSED LASER INTERFEROMETRY

Zhaoliang Peng[1], Xiyu Gu[2], Junfeng Zhou[1], Le Xu[1], Yan Liu[3], Chengliang Sun[2], Wenming Zhang[1], and Lei Shao[1]

[1]Shanghai Jiao Tong University, CHINA, [2]Wuhan University, CHINA, and [3]Wuhan Textile University, CHINA

11:15 - 11:30

T2A.04 PRECISION MEMS TIMING: MICROHEATER AND MACHINE LEARNING COMPENSATION FOR 21 PPT STABILITY AT 7.5 HOURS

Jiawei Yang[1], Shrey Verma[1], Manaka Gomi[1], Jintark Kim[2], Jie Yan[2], Jiheng Jing[2], Gabrielle Vukasin[1], Hyun-Keun Kwon[1], Gaurav Bahl[2], and Thomas W. Kenny[1]

[1]Stanford Univeristy, USA and [2]University of Illinois Urbana-Champaign, USA

11:30 - 11:45

T2A.05 PERIODICALLY POLED LAMB WAVE RESONATORS BASED ON FERROELECTRIC ALUMINUM SCANDIUM NITRIDE

Zichen Tang[1], Giovanni Esteves[2], Travis R. Young[2], Sean Yen[2], and Roy H. Olsson[1]

[1]University of Pennsylvania, USA and [2]Sandia National Laboratories, USA

11:45 - 12:00

T2A.06 MULTI-INDICATOR ULTRASENSITIVE TEMPERATURE SENSING PLATFORM USING PARAMETRICALLY EXCITED RESONATORS

Yue Zheng[1], Seyyed Mojtaba Hassani Gangaraj[1], Mingyo Park[2], Jialin Wang[1], and Azadeh Ansari[1]

[1]Georgia Institute of Technology, USA and [2]Pennsylvania State University, USA

Session T2B - Metasurfaces & Metamaterials

Windemere X

10:30 - 10:45

T2B.01 IMAGING-BASED TERAHERTZ FINGERPRINT SENSING USING A BI-MATERIAL MICROCANTILEVER FOCAL PLANE ARRAY

Zhanxuan Zhou[1], Jiahao Miao[1], Xueliang Wang[1], Xincheng Zhu[1], Cong Lin[1], Yang Zhong[1], Zhenwei Zhang[2], and Xiaomei Yu[1]

[1]Peking University, CHINA and [2]Capital Normal University, CHINA

10:45 - 11:00

T2B.02 A MEMS TUNABLE METASURFACE ASSISTED BY THE BOUND STATES IN THE CONTINUUM

Rongbo Xie, Enze Zhou, Bingbai Li, Jiahao Zhao, Gaofei Zhang, and Xiaoguang Zhao

Tsinghua University, CHINA

11:00 - 11:15

T2B.03 LOW-LOSS PHASE CHANGE MATERIALS ON MID-INFRARED METAMATERIALS FOR NON-VOLATILE OPTICAL MEMORY AND IN-MEMORY COMPUTING

Zhihao Ren[1], Hong Zhou[1], Danian Wang[2], Liangge Xu[3], Chaoquan Hu[2], and Chengkuo Lee[1]
[1]National University of Singapore, SINGAPORE, [2]Jilin University, CHINA, and
[3]Harbin Institute of Technology, CHINA

11:15 - 11:30

T2B.04 HIGH-SENSITIVITY COLORIMETRIC SENSORS BASED ON REFLECTIVE GUIDED-MODE RESONANCE METASURFACES

Lijun Ma, Shuai Wang, Liye Li, Hongshun Sun, Yunhao Cao, Yusa Chen, Dingbang Liu, and Wengang Wu
Peking University, CHINA

11:30 - 11:45

T2B.05 TOPOLOGICALLY ENHANCED INFRARED SENSING THROUGH ALUMINUM SCANDIUM NITRIDE RADIOFREQUENCY PIEZOELECTRIC METAMATERIALS

Tommaso Maggioli[1], Marco Galli[1], Jacopo M. De Ponti2, Marco Colangelo[1], Ghosh Siddhartha[1], and Cristian Cassella[1]
[1]Northeastern University, USA and [2]Politecnico di Milano, ITALY

11:45 - 12:00

T2B.06 METASURFACES FOR BULK SUPPRESSION AND WAVELENGTH-DEPENDENT MID-INFRARED IMAGING

Dongxiao Li[1], Ting-Yi Chen[2], Chun-Pu Tsai[2], Cheng Xu[1], Hong Zhou[1], Zhihao Ren[1], Wei-Chang Li[2], and Chengkuo Lee[1]
[1]National University of Singapore, SINGAPORE and [2]National Taiwan University, TAIWAN

Session T2C – Microfluidics I

Windemere Y

10:30 - 10:45

T2C.01 PARALLEL ANALYSIS OF EXOSOME RNA AND PROTEIN FOR CANCER DIAGNOSIS USING AN INTEGRATED ON-CHIP MICROFLUIDIC SYSTEM

Jiangyu Ji[1,2], Jieyu Wang[1,2], Yiman Song[2], YunXing Lu[3], Huiying Liu[2], Hongju Mao[1], and Jianan Hui[1]
[1]Chinese Academy of Sciences, CHINA, [2]Dalian Medical University, CHINA, and
[3]Shanghai Open University, CHINA

10:45 - 11:00

T2C.02 IMMUNOAFFINITY AND FILTRATION FOR MICROFLUIDIC ISOLATION OF CANCER CELLS

Yang Zhang, Madison L. Chubb, Kangfu Chen, Joanne Lagmay, and Hugh Z. Fan
University of Florida, USA

11:00 - 11:15

T2C.03 TUNABLE PARTICLE SEPARATION USING VIBRATION INDUCED FLOW IN DETERMINISTIC LATERAL DISPLACEMENT MICROPILLAR ARRAYS

Hiroki Fukunaga[1], Naotomo Tottori[1], Shinya Sakuma[1], Takeshi Hayakawa[2], and Yoko Yamanishi[1]
[1]Kyushu University, JAPAN and [2]Chuo University, JAPAN

11:15 - 11:30

T2C.04 ANALYSIS OF THROMBUS CHARACTERISTICS UNDER SHEAR-DEPENDENT FORMATION CONDITIONS

Jiseob Choi[1], Dong-Hwi Ham[1], Jin-Ho Choi[2], and Woo-Tae Park[1]
[1]Seoul National University of Science and Technology, KOREA and [2]Samsung Medical Center, KOREA

11:30 - 11:45

T2C.05 CONTINUOUS SEPARATION AND MECHANOPORATION OF WHITE BLOOD CELLS FROM A WHOLE BLOOD SAMPLE THROUGH MICROPILLAR ARRAYS
Naotomo Tottori, Ryo Takahashi, Hiroki Fukunaga, Shinya Sakuma, and Yoko Yamanishi
Kyushu University, JAPAN

11:45 - 12:00

T2C.06 AN ULTRAHIGH-THROUGHPUT NANOFLUIDIC DEVICE FOR MECHANOPORTION OF EXTRACELLULAR VESICLES VIA HYDRODYNAMIC STRETCHING
Rui Hao
Chinese Academy of Sciences, CHINA

Session T2D - Physical & Optical Sensors

Windemere Z

10:30 - 10:45

T2D.01 FIBER-OPTIC SENSORS WITH WATER-IMMERSIVE MEMBRANES FOR ULTRA-SENSITIVE LOW-FREQUENCY HYDROACOUSTIC DETECTION
Xingyu Wei, Shoulu Gong, Junfeng Zhou, Zhaoliang Peng, Lei Shao, and Wen-Ming Zhang
Shanghai Jiao Tong University, CHINA

10:45 - 11:00

T2D.02 LOW THERMAL CONDUCTIVITY UNCOOLED INFRARED BRIDGE MICROBOLOMETER BASED ON BEAMS OF CONSTANT STRENGTH
Yan Zhao, Wangnan Chen, Zirui Yang, Xiaoyu Qi, Nan Zhang, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

11:00 - 11:15

T2D.03 THERMALLY MATCHED TWIN FOR ACCURATE BANDWIDTH SCALING IN UNCOOLED NANOELECTROMECHANICAL IR SENSOR
Enise F. Altin, Aurelio Venditti, Walter Gubinelli, Pietro Simeoni, Matteo Rinaldi, and Benyamin Davaji
Northeastern University, USA

11:15 - 11:30

T2D.04 MEMS ELECTRIC FIELD SENSOR WITH COMB-ACTUATED RESONANT TORSIONAL SHUTTER
Yohan Jung[1], Eunhwan Jo[2], and Jongbaeg Kim[1]
[1]Yonsei University, KOREA and [2]Kumoh National Institute of Technology, KOREA

11:30 - 11:45

T2D.05 LASER-FABRICATED PIEZORESISTIVE FORCE SENSOR WITH LIQUID IMMERSION LASER SIDEWALL-DOPING
Rihachiro Nakashima[1], Yuki Okamoto[2], Yusuke Takei[2], Tetsuo Kan[3], and Hidetoshi Takahashi[1]
[1]Keio University, JAPAN, [2]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and [3]The University of Electro-Communications, JAPAN

11:45 - 12:00

T2D.06 A MEMS-BASED ELECTROCHEMICAL VIBRATION SENSORS WITH OPTIMIZED FLOW-RESISTANCE AND HIGH-RELIABILITY SENSITIVE UNIT
Nan Zhang, Xiaoyu Qi, Yan Zhao, Xu Ma, Lihao Ma, Zhenchuan Yang, and Chengchen Gao
Peking University, CHINA

12:00 - 14:00 **Lunch**

Poster
Session T3P and Exhibit Inspection

Regency S – V & Rotunda

14:00 - 16:00
Poster presentations are listed by topic category with their assigned number starting on page 30.

15:30 - 16:00 **Break**

Session T4A - Acoustic Devices

Windemere W

16:00 - 16:15

T4A.01 **ENHANCEMENT OF ENERGY EXCHANGE RATE IN MODE-COUPLED MEMS FOR SUPERCONTINUUM FREQUENCY COMBS AND INJECTION LOCKING**
Jiahao Wu, Penghui Song, Shuke Zang, Wenming Zhang, and Lei Shao
Shanghai Jiao Tong University, CHINA

16:15 - 16:30

T4A.02 **ENABLING OPTOMECHANICAL FREQUENCY COMB THROUGH THERMAL AND OPTICAL FORCES IN NONLINEAR NANOMECHANICAL RESONATOR**
Xinchen Wan, Ji Xia, Haoyang Sun, and Guangya Zhou
National University of Singapore, SINGAPORE

16:30 - 16:45

T4A.03 **A MULTI-STRESS CONCENTRATED BUTTERFLY ELECTRODE MEMS UNDERWATER ACOUSTIC SENSOR WITH HIGH SENSITIVITY TO INFRASOUND**
Zhiyue Yang, Lixuan Li, Zhiyong Hu, Tao Ruan, Hanshuo Liu, Fangtao Kuang, and Jingquan Liu
Shanghai Jiao Tong University, CHINA

16:45 - 17:00

T4A.04 **MULTI-FREQUENCY PMUTS FOR PORTABLE BLOOD PRESSURE MONITORING AND VASCULAR ASSESSMENT USING PHOTOACOUSTIC SENSING**
Yexing Fang, Mengyue Zhang, Aocheng Bao, Jinghan Han, Jiao Xia, Bowen Sheng, Haixia Zhang, Changhui Li, and Yipeng Lu
Peking University, CHINA

17:00 - 17:15

T4A.05 **TOWARDS A BIOMIMETIC MEMS MICROPHONE FEATURING TUNABLE PERFORMANCE**
Zhuoyue Zheng[1], Pui-in Mak[1], Chen Wang[2], Luo Huahuang[4], Pan Zhang[3], Qingqing Ke[4], Yuan Wang[1], Rui P. Martins[1], and Michael Kraft[2]
[1]University of Macau, CHINA, [2]University of Leuven, BELGIUM, [3]Peking University, CHINA, and [4]Sun Yat-sen University, CHINA

17:15 - 17:30

T4A.06 **A TO-PACKAGED PHOTONIC MEMS MICROPHONE WITH OUTSTANDING SENSITIVITY BASED ON SELF-MIXING INTERFEROMETRY**
Anyu Li, Junfeng Zhou, Xingyu Wei, Shoulu Gong, and Lei Shao
Shanghai Jiao Tong University, CHINA

Session T4B - Resonators III

Windemere X

16:00 - 16:15

T4B.01 **A HIGH SENSITIVITY MEMS OMNIDIRECTIONAL HYDROPHONE BASED ON A VORTEX-SLIT STRUCTURE**
Fangtao Kuang, Zhiyong Hu, Hanshuo Liu, Zhiyue Yang, Tao Ran, Lixuan Li, and Jingquan Liu
Shanghai Jiao Tong University, CHINA

16:15 - 16:30

T4B.02 **A NOVEL THERMAL ACOUSTIC PARTICLE VELOCITY SENSOR WITH HIGH SENSITIVITY AND LOW POWER CONSUMPTION**
Wangnan Chen, Yan Zhao, Zirui Yang, Xu Ma, Lihao Ma, Xiaoyu Qi, Nan Zhang, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

16:30 - 16:45

T4B.03 **TWO-DECADE-WIDE DENSE PHONONIC FREQUENCY COMBS IN A LINEAR MEMS RESONATOR USING ANALOG FEEDBACK**
Shuke Zang, Jiahao Wu, Lei Shao, and Wenming Zhang
Shanghai Jiao Tong University, CHINA

16:45 - 17:00

T4B.04 **A DEMONSTRATION OF ANALOG/DIGITAL CONVERTER-FREE RESERVOIR COMPUTING USING A SERIES-CONNECTED RESONATING SWITCHED MEMS COUNTER**
Akihiko Yoshida, Ryosho Nakane, Shun Yasunaga, Akio Higo, and Yoshio Mita
University of Tokyo, JAPAN

17:00 - 17:15

T4B.05 **SPECTRUM-CLEAN LINBO3/SIO2/SI SH-SAW RESONATORS UTILIZING COMBINED ELECTRODE APODIZATION AND PROPAGATION ANGLE TWISTING**
Zhi-Qiang Lee, Ya-Ching Yu, Yi-Cheng Liao, Cheng-Chien Lin, Sung-Yuan Huang, and Ming-Huang Li
National Tsing Hua University, TAIWAN

17:15 - 17:30

T4B.06 **SIGNAL-TO-NOISE RATIO ENHANCEMENT FOR MEMS RESONANT SENSORS WITH POTENTIAL BARRIER ADAPTIVE STOCHASTIC RESONANCE**
Junhui Wu and Guangya Zhou
National University of Singapore, SINGAPORE

Session T4C - Biomedical Devices

Windemere Y

16:00 - 16:15

T4C.01 **REALIZATION OF CMOS-BASED MULTIMODAL IMAGE SENSOR FOR THREE-DIMENSIONAL FORCE AND PH MEASUREMENT**
Mami Suzuki[1], Hideo Doi[1], Hiromasa Ito[1], Tomoko Horio1, Ken Ogasahara[2], Satoshi Shimizu[2], Daisuke Akai[1], Takeshi Hizawa[1], Yong-Joon Choi[1], Kazuhiro Takahashi[1], Toshihiko Noda[1], and Kazuaki Sawada[1]
[1]Toyohashi University of Technology and JAPAN, [2]DAIKIN FINETECH, LTD., JAPAN

16:15 - 16:30

T4C.02 **A MINIATURE PHOTOACOUSTIC SYSTEM FOR SKIN MELANIN DETECTION**
Yexing Fang, Aocheng Bao, Zihao Shi, Chong Yang, Ziyi Liang, Jiahao Kang, Bowen Sheng, Haixia Zhang, and Yipeng Lu
Peking University, CHINA

16:30 - 16:45

T4C.03 INTRAVASCULAR-DELIVERED HOLLOW HYDROGEL MICROFIBER WITHOUT BLOOD FLOW INTERRUPTION

Shota Sato[1], Teppei Komatsu[2], Hiroki Ohta[2], Hirotaka JAMES. Okano[2], and Hiroaki Onoe[1]

[1]Keio University, JAPAN and [2]Jikei University, JAPAN

16:45 - 17:00

T4C.04 SMART STENT FOR REAL-TIME ENDOLEAK DETECTION

Trisha Mou[1], Jun Ying Tan[2], Subhrodeep Ray[3], Haijun Liu[3], Jungkwun Kim[2], and Albert Kim[1]

[1]University of South Florida, USA, [2]University of North Texas, USA, and [3]Temple University, USA

17:00 - 17:15

T4C.05 HIGHLY STRETCHABLE BUT STRAIN-INSENSITIVE PRESSURE SENSORS FOR CROSSTALK-FREE ARTERIAL PULSE MONITORING

Shoulu Gong, Xingyu Wei, Guoran Zhang, Qi Zhou, Zhiran Yi, Wenming Zhang, and Lei Shao

Shanghai Jiao Tong University, CHINA

17:15 - 17:30

T4C.06 3D-FLOWER-LIKE BIMETALLIC MXENE INCORPORATED LASER-ENGRAVED GRAPHENE-BASED PHYSIO-CHEMICAL HYBRID PATCH FOR PERSPIRATION ANALYSIS AND CARDIAC HEALTH MONITORING

Md Selim Reza, Zahidul Islam, Md Asaduzzaman, Ahmad Abdus Samad, Dongyun Kim, M. Robiul Islam, and Jae Yeong Park

Kwangwoon University, KOREA

Session T4D - Physical Sensors

Windemere Z

16:00 - 16:15

T4D.01 A HIGHLY STRETCHABLE AND ALL-DIRECTIONAL TRIBOELECTRIC STRAIN SENSOR FOR CHRONIC JOINT STRESS MONITORING

Shital Sharma, Gagan Bahadur Pradhan, Trilochan Bhatta, and Jae Yeong Park

Kwangwoon University, KOREA

16:15 - 16:30

T4D.02 DESIGN AND FABRICATION OF A THERMAL CONDUCTIVITY SENSOR WITH A MICRO-PILLAR FIN STRUCTURE TO ENHANCE HYDROGEN RESPONSE SPEED AND MINIMIZE FLOW RATE INTERFERENCE

Long Cheng, Ying Chen, Tao Jiang, Jiachou Wang, Xinxin Li, and Pengcheng Xu

Chinese Academy of Sciences, CHINA

16:30 - 16:45

T4D.03 A DUAL-AXIS MICRO THERMAL CONVECTIVE TILT SENSOR WITH HIGH SENSITIVITY AND LOW CROSS-AXIS EFFECT

Tingfeng Peng[1], Zihan Lu[1], Hongxin Xu[1], Chunlong Cheng1, Zhiqing Zhang[1], Jingwen Yang[1], Yuan Wang[2], Qingqing Ke[1], and Huahuang Luo[1]

[1]Sun Yat-sen University, CHINA and 2University of Macau, MACAO

16:45 - 17:00

T4D.04 LIQUID METAL FLEXIBLE 3-AXIS FORCE SENSOR ON A DEFORMABLE PNEUMATIC BALLOON FOR SENSOR ATTITUDE CONTROL

Tomohiro Nakatsuka and Satoshi Konishi

Ritsumeikan University, JAPAN

17:00 - 17:15

T4D.05 PROBING THERMAL STABILITY OF MOLYBDENUM DITELLURIDE NANOFLAKE USING MEMS THERMOGRAVIMETRIC SENSORS

Jun Li[1,2], Hao Jia[1], Pengcheng Xu[1], and Xinxin Li[1]

[1]Chinese Academy of Sciences, CHINA and [2]ShanghaiTech University, CHINA

17:15 - 17:30

T4D.06 MICRO TRIAXIAL FORCE PLATE SUPPORTED BY TILTED UV-CURABLE PDMS PILLARS WITH ISOTROPIC SPRING CONSTANTS VIA LIQUID-IMMERSION INCLINED EXPOSURE
Toshihiro Shiratori, Gakuto Kagawa, and Hidetoshi Takahashi
Keio University, JAPAN

17:30 Adjourn for the Day

Benefactor and Exhibitor Receptions

18:30 - 20:00

Wednesday, 2 July

Session W1A - Quantum Devices

Windemere W

08:30 - 09:00

INVITED PRESENTATION

W1A.01 QUANTUM SENSORS - THE JOURNEY FROM THE LABORATORY TO A PRODUCT OF DAILY LIFE
Andre Kretschmann
Robert Bosch GmbH, GERMANY

09:00 - 09:15

W1A.02 A NOVEL PHYSICS PACKAGE FOR CHIP-SCALE ATOMIC CLOCKS
Ali Darvishian[1], Peter Cash[1], Lichung Ha[1], Mark Trainoff[1], Mike Silvera[1], Luan Vo[1], Igor Kosvin[1], Jackie Ellett[1], Robert Conners[1], Mark Mescher[2], and Richard Overstreet[1]
[1]Microchip Technology, USA and [2]Draper, USA

09:15 - 09:30

W1A.03 QUANTUM CAPACITIVE LACTATE DEHYDROGENASE LABEL-FREE BIOSENSOR BASED ON ONE-STEP BIOINTERFACE PREPARATION
Zening Li[1], Lin Zhou[1], Rongtao Zhang[2], Jianlong Zhao[1], and Hongju Mao[1]
[1]Chinese Academy of Sciences, CHINA and [2]Tianjin University of Traditional Chinese Medicine, CHINA

09:30 - 09:45

W1A.04 FIBER-BASED HIGH-VOLTAGE GRID CURRENT MEASUREMENT USING INTEGRATED DIAMOND QUANTUM SENSOR
Yaochen Zhu[1], Qihui Liu[1], Xiao Peng[1], Nan Wang[1], Yuqiang Hu[2,3], Xin Luo[2,3], Chunji Zhang[4], Wei Liu[4], Hao Chen[1,2], Jiangong Cheng[1], and Zhenyu Wu[1,2,3]
[1]Chinese Academy of Sciences, CHINA, [2]Shanghai University, CHINA,
[3]Shanghai Industrial Technology Research Institute, CHINA, and
[4]Xi'an XD High Voltage Apparatus Co., Ltd, CHINA

Session W1B - Microfluidics II

Windemere X

08:30 - 10:00

INVITED PRESENTATION

W1B.01

Peter Willis
Jet Propulsion Laboratory, USA

09:00 - 09:15

W1B.02 HIGH-SPEED MULTI-SORTING SYSTEM OF LARGE PARTILCES BY UTILIZING TRAVELING VORTEX GENERATIONS

Makoto Saito[1], Nariaki Kiyama[1], Yoko Yamanishi[1], Niko Kimura2, Shigeo S. Sugano[3], and Shinya Sakuma[1]
[1]Kyushu University, JAPAN, [2]Tokyo University of Agriculture and Technology, JAPAN, and [3]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

09:15 - 09:30

W1B.03 DIGITAL MICROFLUIDIC IONIZATION FOR REAL-TIME MINIATURE MASS SPECTROMETRY

Menglei Zhao, Zongliang Guo, Haobing Liu, Boyu Li, Liyuan Guo, Huikai Xie, Rongxin Fu, Hang Li, and Shuailong Zhang
Beijing Institute of Technology, CHINA

09:30 - 09:45

W1B.04 CONTINUOUS GENERATION OF DROPLETS ENCAPSULATING TWO SINGLE PARTICLES USING AN ON-CHIP "VIRTUAL PARTICLE VALVE" INTEGRATED WITH MICROPILLAR ARRAYS

Naotomo Tottori, Yuma Kadomura, Shinya Sakuma, and Yoko Yamanishi
Kyushu University, JAPAN

09:45 - 10:00

W1B.05 AN ACTIVE-MATRIX ELECTRO-DEWETTING ARRAY FOR DIGITAL MICROFLUIDICS

Xinying Xie[1], Qining Wang[2], Yushen Hu[1], Runxiao Shi[1], Tengteng Lei[1], Chang Jin CJ. Kim[2], and Man Wong[1]
[1]Hong Kong University of Science and Technology, HONG KONG and [2]University of California, Los Angeles, USA

Session W1C - PiezoMEMS

Windemere Y

08:30 - 10:00

INVITED PRESENTATION

W1C.01 PIEZOELECTRIC AND PIEZOELECTRET SENSORS, ACTUATORS AND MICROSYSTEMS

Liwei Lin
University of California, Berkeley, USA

09:00 - 09:15

W1C.02 SCALABLE PIEZO-OPTOMECHANICAL TRANSDUCER MATCHED TO A SUPERCONDUCTING QUBIT FOR OPTICAL READ-OUT

Kiki L. Schuurman[1], Thierry C. van Thiel[1], Matthew J. Weaver1, Federico Berto[1], Pim Duivestein[1], Mathilde Lemang[1], Martin Zemlicka[1], Fred Hijazi[1], Alexandra C. Bernasconi[1], Cristobal Ferrer[1], Ella Lachman[2] Mark Field[2], Yuvraj Mohan[2], Fokko K. De Vries[3], Niels Bultink[3], Jules van Oven[3], Josh Y. Mutus[2], Rob Stockill[1], and Simon Gröblacher[1]
[1]QphoX, NETHERLANDS, [2]Rigetti Computing Inc., USA, and [3]Qblox Quantum, NETHERLANDS

09:15 - 09:30

W1C.03 PIEZOMEMS TUNABLE ULTRA LOW-NOISE LASER

Alaina G. Attanasio[1], Andrey A. Voloshin[2,3], Anat Siddharth[2], Simone Bianconi[2], Andrea Bancora[2,3], Vladimir Shadymov[2,3], Sebastien Leni[3], Rui N. Wang[2], Johann Riemensberger[2], Tobias J. Kippenberg[2], and Sunil A. Bhave[1]

[1]Purdue University, USA, [2]Swiss Federal Institute of Technology Lausanne (EPFL), SWITZERLAND, and [3]DEEPLIGHT SA, SWITZERLAND

09:30 - 09:45

W1C.04 WIDE SCAN ANGLE AND LARGE APERTURE (180 DEGREES/2.5MM) RESONANT PIEZOELECTRIC MEMS MIRROR

Hung-Yu Lin[1,2], Mingching Wu[2], Mei-Feng Lai[1], and Weileun Fang[1]

[1]National Tsing Hua University, TAIWAN and [2]Coretronic MEMS Corporation, TAIWAN

09:45 - 10:00

W1C.05 BI-AXIAL PIEZOELECTRIC MEMS MICROMIRROR WITH ARCHED ACTUATOR UTILIZING D32 EFFECT FOR BOTH RASTER AND LISSAJOUS SCANNING

Hui-Ming Yang[1], Chang-I Lin[1], Po-Chun Lin[1], Wei-Kai Sung[1], Jerwei Hsieh[2], and Weileun Fang[1]

[1]National Tsing Hua University, TAIWAN and [2]Asia Pacific Microsystems, Inc., TAIWAN

Session W1D - Materials Characterization

Windemere Z

08:30 - 10:00

INVITED PRESENTATION

W1D.01 To Be Determined

09:00 - 09:15

W1D.02 ENHANCED CHARACTERIZATION OF PA6 CRYSTALLIZATION USING MEMS DSC INTEGRATED WITH IN SITU FTIR SPECTROSCOPY

Zechun Li[1], Shaokui Tan[1,2], Yuhang Yang[1], Ming Li[1], Xiaoyuan Xia[1,3], Yemin Dong[1,3], Pengcheng Xu[1], and Xinxin Li[1]

[1]Chinese Academy of Sciences, CHINA, [2]Shanghai Normal University, CHINA, and [3]Shanghai Industrial Technology Research Institute (SITRI), CHINA

09:15 - 09:30

W1D.03 DOUBLE-AXIS TAPERED HS-AFM NANOCANTILEVER FOR BIOMEDICAL APPLICATIONS

Eying Sim Wong[1], Aron Michael[1], Jayden Moore[1], Hemanshu Pota[2], and Chee Yee Kwok[1]

[1]University of New South Wales (UNSW), Sydney, AUSTRALIA and [2]University of New South Wales (UNSW), Canberra, AUSTRALIA

09:30 - 09:45

W1D.04 IN-SITU TGA-IR MATERIAL CHARACTERIZATION SYSTEM BASED ON A RESONANT CANTILEVER AND ITS APPLICATION IN REGULATING THE PROPERTIES OF SINGLE CRYSTAL COF

Qiaoyuan Yang[1], Zijian Wu[1,2], Ruomeng Guo[1], Ming Li[1], Pengcheng Xu[1], and Xinxin Li[1]

[1]Chinese Academy of Sciences, CHINA and [2]Shanghai Normal University, CHINA

09:45 - 10:00

W1D.05 A METHOD FOR IN-SITU ON-WAFER COMPRESSION TEST OF MICROBEAMS

Yi Chen and Dacheng Zhang

Peking University, CHINA

10:00 - 10:30 **Break and Exhibit Inspection**

Session W2A - Piezoelectric Devices

Windemere W

10:30 - 10:45

W2A.01 ALSCN BASED PIEZOELECTRICALLY DRIVEN QUASI-STATIC MEMS SCANNERS WITH LARGE FIELD OF VIEW WITH SELECTABLE REGIONS OF INTEREST

Paul Raschdorf[1], Christian V. Hofen[1], Erdem Yarar[1], Gunnar Wille[1], Jeong-Yeon Hwang[1], Fabian Lofink[1,2], and Shanshan Gu-Stoppel[1,3]

[1]Fraunhofer ISIT, GERMANY, [2]CAU Kiel, GERMANY, and [3]FH Westküste, GERMANY

10:45 - 11:00

W2A.02 ON THE DESIGN OF PIEZOELECTRIC MEMS SPEAKER COMBINING CENTRAL CROSS-DIAPHRAGM WITH WING-LIKE DIAPHRAGM TO IMPROVE SOUND PRESSURE LEVEL BANDWIDTH

Po-Shen Chen[1], Chia-Hao Lin[1], Chin Tseng[1], Zih-Song Hu[1], Sung-Cheng Lo[2], and Weileun Fang[1]

[1]National Tsing Hua University, TAIWAN and [2]Upbeat Technology Co., Ltd., TAIWAN

11:00 - 11:15

W2A.03 HIGH-PERFORMANCE PIEZOELECTRIC MEMS SPEAKERS FOR IN-EAR APPLICATIONS

Fabrizio Cerini[2], Chiara Gazzola[1], Filippo P. Perli[1], Michele Rosso[1], Silvia Adorno[2], and Alberto Corigliano[1]

[1]Politecnico di Milano, ITALY and [2]STMicroelectronics, ITALY

11:15 - 11:30

W2A.04 PHYSICS-INFORMED NEURAL NETWORKS FOR MODAL ANALYSIS OF DIAPHRAGM-STRUCTURED MEMS WITH EXPERIMENTAL VALIDATION

Jiapeng Xu[1,2], Gabriele Schrag[2], Zhou Da[3], Yong Wang[4], and Tingzhong Xu[1]

[1]Silicon Austria Labs, AUSTRIA, [2]Technical University of Munich, GERMANY, [3]Roma Tre University, ITALY, and [4]University of Oxford, UK

11:30 - 11:45

W2A.05 SPL AND THD IMPROVEMENT OF PIEZOELECTRIC MEMS MICROSPEAKER VIA PARALLEL DUAL CURVE SPRINGS WITH RING ACTUATOR

Chia-Hao Lin[1], Chin Tseng[1], Sung-Cheng Lo[2], Mei-Feng Lai[1], and Weileun Fang[1]

[1]National Tsing Hua University, TAIWAN and [2]Upbeat Technology, TAIWAN

11:45 - 12:00

W2A.06 MICROPATTERNED PDMS DAMPING LAYER INTEGRATION TO ENHANCE THE FIDELITY OF PIEZOELECTRIC MEMS SPEAKERS WITHOUT SPL PENALTY

Xuchen Wang[1], Yukio Suzuki[1], Chung-Min Li[2], and Shuji Tanaka[1]

[1]Tohoku University, JAPAN and [2]AAC Technologies PTE.LTD, SINGAPORE

Session W2B - Bio & Chemical Sensors

Windemere X

10:30 - 10:45

W2B.01 ELECTROCHEMICAL BIOSENSOR FOR REAL-TIME IN-VIVO MONITORING OF TUMOR PH, OXYGEN, AND ELECTRICAL CONDUCTIVITY

Jun Ying Tan[1], Poonam Yadav[2], Santosh Kumar Mandal[2], Aabila Tharzeen[3], Anna Bottiglieri[4], Rahul Sheth[2], Balasubramaniam Natarajan[3], Punit Prakash[4], and Jungkwun 'JK' Kim[1]

[1]University of North Texas, USA, [2]University of Texas, USA, [3]Kansas State University, USA, and [4]George Washington University, USA

10:45 - 11:00

W2B.02 MONITORING SINGLE-CELL NEUROTRANSMITTER EXOCYTOSIS USING CARBONIZED WOOD ELECTROCHEMICAL SENSORS REVEALS THE NEUROLOGICAL EFFECTS OF NATURAL PRODUCTS

Xuefeng Wang[1], Zihui Li[1,2], Wenxue Chen[1,3], Haoliang Li[1,3], Qiongya Wan[1,2], Yongheng Zhu[2], Dan Zheng[3], Pengcheng Xu[1], and Xinxin Li[1]
[1]Chinese Academy of Sciences, CHINA, [2]Shanghai Ocean University, CHINA, and [3]Shanghai Institute of Technology, CHINA

11:00 - 11:15

W2B.03 EFFECT OF DIFFUSION AT THE AU/N-SI SCHOTTKY INTERFACE IN CURRENT DETECTION SURFACE PLASMON RESONANCE SENSORS

Masaya Ukaji, Eslam Abubakr, Yuki Imai, and Tetsuo Kan
University of Electro-Communications, JAPAN

11:15 - 11:30

W2B.04 A WIRELESS PAPER HUMIDITY SENSOR BASED ON COPPER-GRAPHENE COMPOSITE FOR PLANT TRANSPIRATION MONITORING

Chao Liang[1], Yuxuan Fan[2], Ziqi Mei[1], Wenqiang Zhang[2], and Xiaoguang Zhao[1]
[1]Tsinghua University, CHINA and [2]China Agricultural University, CHINA

11:30 - 11:45

W2B.05 LOW-COST LEAD-ION IMPRINTED POLYMER MEMBRANE MICROFLUIDIC SENSOR FOR SELECTIVE TRACE LEAD MONITORING IN WATER

Ayobami E. Oseyemi and Pouya Rezai
York University, CANADA

11:45 - 12:00

W2B.06 ACHIEVING SELECTIVE SENSING IN MICROBIAL FUEL CELL BIOSENSORS BY DEEP-LEARNING-BASED NEURAL NETWORKS FOR DETECTION OF TETRACYCLINE AND PENICILLIN IN WATER

Fengxiang Tang, Yining Wang, Boya Liu, and Hao Ren
ShanghaiTech University, CHINA

Session W2C - Nanomaterials

Windemere Y

10:30 - 10:45

W2C.01 SUBMICROMETRIC HIERARCHICAL NANOPOROUS PATTERNS FOR LUBRICANT-INFUSED SURFACES WITH ENHANCED LUBRICANT RETENTION AND RECOVERY

Joowon Lim, Geonho Lee, Beomsu Kim, Sunbin Yoon, Sueng Yoon Lee, Byeongju Hong, Junho Oh, and Won Chul Lee
Hanyang Univeristy, KOREA

10:45 - 11:00

W2C.02 HEMISPHERICAL SILVER NANOSHELL ARRAY ON SILICON NANOSPHERES FOR SURFACE-ENHANCED RAMAN SPECTROSCOPY

Taeyeong Kim and Jungchul Lee
Korea Advanced Institute of Science and Technology (KAIST), KOREA

11:00 - 11:15

W2C.03 EPITAXIAL AUCN NANOSPRINGS ON CARBON NANOTUBES REDUCED TO AU VIA ELECTRON-BEAM-INDUCED RADIOLYSIS.

Sunbin Yoon, Joowon Lim, and Won Chul Lee
Hanyang University, KOREA

11:15 - 11:30

W2C.04 A MICROFLUIDIC PLATFORM BASED ON NANOTUBE FORESTS FOR ANTI-EVAPORATION APPLICATIONS

Jing Wen[1], Qiming Guo[1], Fei Zhan[2], Lei Wang[2], Na Zhou[1], and Haiyang Mao[1,2]
[1]Chinese Academy of Sciences, CHINA and [2]Beijing Forestry University, CHINA

11:30 - 11:45

W2C.05 AN INVESTIGATION OF VO2 NANOWIRE ARRAYS FOR INTEGRATED SENSING. FROM NON-STOCHASTIC NANOWIRES TO STOCHASTIC NANOSTRUCTURES

Vanessa Conti, Andrea Iaconeta, Cyrille Masserey, Anna Varini, Riccardo Chiesa, Andras Kis, Igor Stolichnov, and Adrian M. Ionescu
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

11:45 - 12:00

W2C.06 LIQUID-TO-GAS PHASE CHANGE-BASED STRETCHABLE ACTUATOR WITH INTEGRATED CARBON NANOTUBE BUNDLES

Sangjun Sim[1], Seungin Jo[1], Kyubin Bae[2], and Jongbaeg Kim[1]
[1]Yonsei University, KOREA and [2]University of Texas, Austin, USA

Session W2D - Neural Interfaces

Windemere Z

10:30 - 10:45

W2D.01 THREE-DIMENSIONAL MICROELECTRODE ARRAY WITH VERTICALLY-ALIGNED CARBON NANOTUBES FOR RETINAL NEURAL SIGNAL RECORDING

Hyunjun Han[1], Sangjun Sim[1], Chaesung Kim[2,3], Maesoon Im[2,4,5], and Jongbaeg Kim[1]
[1]Yonsei University, KOREA, [2]Korea Institute of Science and Technology, KOREA, [3]Korea University, KOREA, [4]University of Science and Technology, KOREA, and [5]Kyung Hee University, KOREA

10:45 - 11:00

W2D.02 AN IMPLANTABLE MULTI-LAYER CARBON NANOELECTRODE BASED ON MPCVD AND ATMOSPHERIC PLASMA JET, FOR RECORDING OF INTRACELLULAR O2 AND NEURAL SIGNALS

Zhiyuan Du[1], Qingda Xu[1], Ye Xi[1], Mengfei Xu[1], Kunyu Zheng[1], Ning Wei[1], Haoyuan Chen1, Xiuyan Li[1], Qingkun Liu[1], Xiaolin Wang[1], Bin Yang[1], Wen Li[2], and Jingquan Liu[1]
[1]Shanghai Jiao Tong University, CHINA and [2]Michigan State University, USA

11:00 - 11:15

W2D.03 STRETCHABLE MICRONEEDLE ARRAY ELECTRODE FOR MOVEMENT-RESISTANT ELECTROENCEPHALOGRAM MONITORING

Jiayan Zhang, Yunxu Zhao, Junshi Li, Zhitong Zhang, and Zhihong Li
Peking University, CHINA

11:15 - 11:30

W2D.04 A CHRONIC MULTIMODAL PLATFORM FOR SIMULTANEOUS ELECTROPHYSIOLOGY AND CALCIUM IMAGING DURING MOTOR BEHAVIOUR

Om T. Kolhe[1], Alec C. Booth[1,2], Hammad F. Khan[1], and Krishna Jayant[1]
[1]Purdue University, USA and [2]Indiana University School of Medicine, USA

11:30 - 11:45

W2D.05 AN ALL-IN-ONE IMPLANTABLE FLEXIBLE PROBE WITH INTEGRATED SELF-REFERENCING ELECTRODE FOR NEURAL RECORDING, ELECTRIC STIMULATION, AND IN-SITU PH SENSING

Ning Wei, Longchun Wang, Kejun Tu, Jiawei Cao, Qingda Xu, Mengfei Xu, Chunpeng Jiang, Haoyuan Chen, Bin Yang, Xiaolin Wang, and Jingquan Liu
Shanghai Jiao Tong University, CHINA

11:45 - 12:00

W2D.06 **DEVELOPMENT OF A WIRELESS IMPLANTABLE INTRACRANIAL PRESSURE MONITORING SYSTEM**
Kehui Qi, Changding Li, Nan Li, Qinggang Meng, Jian Chen, and Junbo Wang
Chinese Academy of Sciences, CHINA

12:00 - 14:00 **Lunch**

Session W3A - Ultrasonic Devices

Windemere W

14:00 – 14:15

W3A.01 **GHZ ULTRASOUND FOR QUANTITATIVE OOCYTE MECHANOBIOLOGY**
Yilmaz Arin Manav[1], Andrew Piasecki[1], Dori Woods[1], Amit Lal[2,3], and Benyamin Davaji[1]
[1]Northeastern University, USA and [2]Geegah LLC, USA, [3]Cornell University, USA

14:15 - 14:30

W3A.02 **PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCER (PMUT) BASED ON BILAYER X-CUT LITHIUM NIOBATE**
Xiaoxi Zhao, Michiel Pertijs, and Tomás Manzaneque
Delft University of Technology (TU Delft), NETHERLANDS

14:30 - 14:45

W3A.03 **NONLINEARITY MODULATING OF THE SCALN-BASED PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCER WITH DC BIAS AND SINGLE-TONE AC DRIVING SIGNAL**
Zihan Lu[1], Hongxin Xu[1], Xuefei Yan[1], Tingfeng Peng[1], Chunlong Cheng[1], Jingwen Yang[1], Zhiqing Zhang[1], Yuan Wang[2], Huahuang Luo[1], and Qingqing Ke[1]
[1]Sun Yat-sen University, CHINA and [2]University of Macau, MACAO

14:45 - 15:00

W3A.04 **A NOVEL VERTICAL DUAL-GAP CMOS-MEMS CMUT ENABLING LARGE FRACTIONAL BANDWIDTH**
Wei-Hsiang Hsu[1], Hung-Yu Chen[2], and Sheng-Shian Li[1]
[1]National Tsing Hua University, TAIWAN and [2]University of California, Berkeley, USA

15:00 - 15:15

W3A.05 **LINEAR SELF-FOCUSING ACOUSTIC TRANSDUCER**
Akash Roy, Kianoush Sadeghian Esfahani, Anik Sengupta, Yicheng Zhang, and Eun S. Kim
University of Southern California, USA

Session W3B - Biomedical Devices

Windemere X

14:00 - 14:15

W3B.01 **ON-DEMAND ISOTROPIC OR ANISOTROPIC PERFORATION OF BIOLOGICAL TISSUE BY BI-MODAL CONTROL OF PLASMA ETCHING AND MICRO-FLUIDIC JET**
Yuudai Aokusa, Yibo Ma, Shigeaki Miura, Yuma Minami, and Yoko Yamanishi
Kyushu University, JAPAN

14:15 - 14:30

W3B.02 PULSATED IN-SITU DRIED ELECTROSTRETCHING FABRICATION OF MICRONEEDLES FOR TRANSDERMAL DRUG DELIVERY

Ngoc Luan Mai[1], Thi Van Anh Hoang[1], Trung-Hieu Vu[1], Hoai-Duc Vu[1], Canh Doan[1], Yuen Yong[2], Thien Xuan Dinh[3], Dzung Dao[1], and Van Thanh Dau[1]
[1]Griffith University, AUSTRALIA, [2]University of Newcastle, AUSTRALIA, and 3The Commonwealth Scientific and Industrial Research Organisation, AUSTRALIA

14:30 - 14:45

W3B.03 QUALITY FACTOR (QF) SENSITIVE LCR PATTERNS FOR ORTHORPEDIC IMPLANT STRAIN MONITORING

Jincai Huang and Xining Zang
Tsinghua University, CHINA

14:45 - 15:00

W3B.04 IN VIVO BIO-IMPEDANCE SENSING CAPSULE STUDY FOR MONITORING MUCOSAL PERMEABILITY IN A DSS-COLITIS RAT MODEL

Mateo W. Lim, Justin M. Stine, Hammed Ayansola, Brian M. Holt, Luke A. Beardslee, Jain Kim, Jiecheng Chen, Younggeon Jin, and Reza Ghodssi
University of Maryland, USA

15:00 - 15:15

W3B.05 SELF-POWERED PEEK-BASED IMPLANTS FOR ELECTRIC-FIELD-ENHANCED OSTEOGENESIS

Jincai Huang, Yuanshuai Dai, Jia Cheng, Zhe Zhao, and Xining Zang
Tsinghua University, CHINA

15:15 - 15:30

W3B.06 MILLIMETRIC IMPLANTABLE DEVICE FOR EXTENDED IN-VIVO FLUORESCENCE RECORDING

Xu Tian, Argyris Spyrou, Göran Stemme, and Niclas Roxhed
KTH Royal Institute of Technology, SWEDEN

Session W3C - Flow Sensors

Windemere Y

14:00 - 14:15

W3C.01 INSECT ANTENNAE-BASED SENSOR FOR ACCURATE ODOR CONCENTRATION DETERMINATION BY COMBINING AIRFLOW AND ODOR MEASUREMENT

Ryusei Ando[1], Chihiro Fukui[2], Kei Ohara[1], Daigo Terutsuki[3], Toshiyuki Nakata[2], and Hidetoshi Takahashi[1]
[1]Keio University, JAPAN, [2]Chiba University, JAPAN, and [3]Shinshu University, JAPAN

14:15 - 14:30

W3C.02 HIGH RESOLUTION AND LARGE RANGE ULTRASONIC FLOW MONITORING BASED ON MONOLITHIC PMUT PHASED ARRAY WITH BIDIRECTIONAL BEAMS

Yufeng Gao, Xili Wang, Lei Zhao, Aocheng Bao, and Yipeng Lu
Peking University, CHINA

14:30 - 14:45

W3C.03 ROBUST PITOT-TYPE WATERFLOW SENSOR SYSTEM FOR MARINE ANIMALS IN HARSH ENVIRONMENTS

Takuto Kishimoto and Hidetoshi Takahashi
Keio University, JAPAN

14:45 - 15:00

W3C.04 PALM-SIZED WIRELESS MEMS FLOW SENSOR SYSTEM ATTACHABLE TO MEDICAL MASK FOR REAL-TIME RESPIRATION MONITORING

Muhammad Salman Al Farisi[1], Tsuyoshi Tsukada[1], Yoshihiro Hasegawa[1], Miyoko Matsushima[2], Shin Hasegawa[3], Tsutomu Kawabe[2], and Mitsuhiro Shikida[1]
[1]Hiroshima City University, JAPAN, [2]Nagoya University, JAPAN, and [3]COSMOSWEB Co., Ltd., JAPAN

15:00 - 15:15

W3C.05 MICROFLUIDIC THERMAL FLOW SENSOR WITH EXTENDED LINEAR RANGE AND REDUCED HEAT DISSIPATION USING A SHUNT

Maarten J S. Bonnema[1], Jarno Groenesteijn[2], Remco J. Wiegerink[1], and Joost C. Lötters[1]
[1]University of Twente, NETHERLANDS and [2]Bronkhorst High-Tech B.V., NETHERLANDS

15:15 - 15:30

W3C.06 MONOLITHICALLY INTEGRATED FLEXIBLE MULTI-SENSOR FOR FLOW, TEMPERATURE, AND CONDUCTIVITY MEASUREMENT IN IONIC SOLUTIONS

Haoxin Hu, Wenlin Xiao, Ke Xiao, and Wei Xu
Shenzhen University, CHINA

Session W3D - Actuators

Windemere Z

14:00 - 14:15

W3D.01 BIOHYBRID MUSCLE ACTUATOR WITH EMBEDDED SPRING-SHAPED SKELETON FOR MULTIMODAL ELEPHANT TRUNK-LIKE MOTION

Shota Nakamura, Byeongwook Jo, Minghao Nie, and Shoji Takeuchi
University of Tokyo, JAPAN

14:15 - 14:30

W3D.02 ELECTRON-DRIVEN NANOACTUATORS IN GENETICALLY ENGINEERED SPIDER SILK PROTEINS

Wenyuan Liu, Nan Qin and Tiger H. Tao
Chinese Academy of Sciences, CHINA

14:30 - 14:45

W3D.03 CANTILEVER FREE MULTISTABLE MAGNETIC LIFT ACTUATOR FOR LARGE OUT-OF-PLANE DISPLACEMENTS

Pascal M. Weber and Ulrike Wallrabe
Albert Ludwigs Universität, Freiburg, GERMANY

14:45 - 15:00

W3D.04 HEXASTABLE MEMS STAGE

Shun Yasunaga and Yoshio Mita
University of Tokyo, JAPAN

15:00 - 15:15

W3D.05 CASCADE-ACTUATION UNCOUPLED-MOTION XYZ-MICROSTAGE WITH MONOLITHIC INTEGRATION OF IN-PLANE COMB-DRIVE XY-MICROSTAGE AND OUT-OF-PLANE AL/SIO2 BIMORPH THERMOELECTRIC ACTUATORS

Huanyu Dai, Zengyi Wang, Penghong Shi, Junyang Ding, Bing Li, and Gaopeng Xue
Harbin Institute of Technology, CHINA

15:15 - 15:30

W3D.06 SLITHER-TYPE BIOHYBRID ROBOT POWERED BY HIGHLY CONTRACTILE MUSCLE RINGS

Tomohiro Morita, Minghao Nie and Shoji Takeuchi
University of Tokyo, JAPAN

Poster Session W4P and Exhibit Inspection

Regency S – V & Rotunda

15:35 - 17:30
Poster presentations are listed by topic category with their assigned number starting on page 30.

15:30 – 16:00 **Break**

17:30 Adjouorn for the Day

Transducers 2025 Conference Banquet

17:30 - 23:00

Thursday, 3 July

Session Th1A - Robotics & Tactile Sensing

Windemere W

08:30 - 09:00

INVITED PRESENTATION

Th1A.01 EMERGING ROBOTIC TECHNOLOGIES EXPANDING CAPABILITIES IN THE MICROSCOPIC WORLD FOR BIOMEDICAL INNOVATIONS
Fumihito Arai
University of Tokyo, JAPAN

09:00 - 09:15

Th1A.02 MULTI-UNIT TERAHERTZ FREQUENCY SELECTIVE FINGERPRINT SENSOR: WIDEBAND IDENTIFICATION OF TRACE SUBSTANCES
Hongshun Sun, Yunhao Cao, Yusa Chen, Liye Li, Lijun Ma, and Wengang Wu
Peking University, CHINA

09:15 - 09:30

Th1A.03 AN ARTERIAL COMPLIANCE MEASURING WRISTWATCH WITH FLEXIBLE TACTILE SENSING DENSE-ARRAY
Yi Sun[1], Fang Wang[1,2], Yue He[1,4], Yunhao Wang[1,3], Hao Yu[1,2], Ke Sun[1], Tiger H. Tao[1], Xiaoyuan Xia[1], Yemin Dong[1], Heng Yang[1,2], and Xinxin Li[1,2]
[1]Chinese Academy of Sciences, CHINA, [2]University of Chinese Academy of Sciences, CHINA, [3]ShanghaiTech University, CHINA, and [4]Jiangsu University, CHINA

09:30 - 09:45

Th1A.04 ULTRA-FAST AND SCALABLE MICROFABRICATION OF FLEXIBLE TACTILE SENSORS VIA SEQUENTIAL DIGITAL LIGHT PROCESSING
Muhammad Faizul Zaki, Wan-Ru Huang, Phong Vi Lam, Chen-Fang Sun, and Pin-Chuan Chen
National Taiwan University, TAIWAN

09:45 - 10:00

Th1A.05 SENSITIVITY ENHENCEMENT IN MONOLITHICAL CMOS-MEMS TACTILE FORCE AND PROXIMITY SENSORS USING 3D TOROIDAL COILS
Ruei-Cing Mai, Yi-Ming Lai, Pei-Yun Li, Meifeng Lai, Rongshun Chen, and Weileun Fang
National Tsing Hua University, TAIWAN

Session Th1B - Energy Harvesters

Windemere X

08:30 - 09:00

INVITED PRESENTATION

Th1B.01
Chengkuo "Vincent" Lee
National University of Singapore, SINGAPORE

09:00 - 09:15

Th1B.02 HIGH SURFACE POTENTIAL LANTHANUM ALUMINATE ELECTRET THIN FILM FOR VIBRATIONAL ENERGY HARVESTING DEVICES
Takuya Igashira[1], Daisuke Nishitani[1], Hideyuki Nagai[1], Hirokazu Nakazawa[1], Noriyuki Matsushita[2], Kazuhiko Kano[2], Yumi Tanaka[3], Hiroaki Honma[4], and Hiroyuki Wado[1]
[1]MIRISE Technologies Corporation, JAPAN, [2]DENSO Corporation, JAPAN, [3]Tokyo University of Science, JAPAN, and [4]Kobe University, JAPAN

09:15 - 09:30

Th1B.03 A PROBIOTIC-POWERED TRANSIENT BATTERY WITH PH-RESPONSIVE BIODEGRADATION
Maryam Rezaie and Seokheun Choi
State University of New York, Binghamton, USA

09:30 - 09:45

Th1B.04 A NOVEL MULTI-OBJECTIVE OPTIMIZATION METHOD BY MACHINE LEARNING AND ITS APPLICATION IN MEMS VIBRATION ENERGY HARVESTERS DESIGN
Yisong Ling[1], Haizhao Feng[1], Ling Bu[2], Siyao Jiang[1], and Xiaohong Wang[1]
[1]Tsinghua University, CHINA and [2]China University of Geosciences, CHINA

09:45 - 10:00

Th1B.05 3D MOULDED FLEXIBLE VIBRATION ENENRGY HARVESTER WITH HOURGLASS BEAMS FOR MULTIMODAL RESPONSE IN LOW-FREQUENCY RANGE
Rui Jiang[1], Ling Bu[1], Shihan Yang[1], and Xiaohong Wang[2]
[1]China University of Geosciences, CHINA and [2]Tsinghua University, CHINA

Session Th1C - Environmental Sensors

Windemere Y

08:30 - 09:00

INVITED PRESENTATION

Th1C.01 ECOSENSE – SMART SENSORS ALONE IN THE FOREST
Ulrike Wallrabe
University of Freiburg, GERMANY

09:00 - 09:15

Th1C.02 3-D WAVE MEASUREMENT SYSTEM USING IMU AND MEMS CANTILEVER-TYPE DIFFERENTIAL PRESSURE SENSOR
Kyota Shimada, Takuto Kishimoto and Hidetoshi Takahashi
Keio University, JAPAN

09:15 - 09:30

Th1C.03 DEVELOPMENT OF A REUSABLE PM SAW SENSOR SYSTEM WITH A MICROHEATER AND POROUS MICROSTRUCTURE FILTER MEMBRANE FOR PM10 AND PM2.5 DETECTION
Faisal Nawaz, Jaepil Song, and Keekeun Lee
Ajou University, KOREA

09:30 - 09:45

Th1C.04 FULLY BIODEGRADABLE WIRELESS SOIL UREA SENSOR USING METAMATERIAL PERFECT ABSORBER FOR ROBUST MEASUREMENTS
Yu Tanaami[1], Ken Sakabe[1], Tetsuo Kan[2], and Hiroaki Onoe[1]
[1]Keio University, JAPAN and [2]University of Electro-Communications, JAPAN

09:45 - 10:00

Th1C.05 MANUFACTURING OF ZINC OXIDE NANOPARTICLE-FUNCTIONALIZED CELLULOSE NANOFIBROUS AEROGEL FOR ULTRA-FINE DUST FILTRATION AND REAL-TIME NO2 DETECTION
Yun Sik Hwang[1], Yeawan Lee[2], Donghyun Lee[1], Sang Bok Kim[2], and Jungwook Choi[1]
[1]Chung-Ang University, KOREA and [2]Korea Institute of Machinery and Materials, KOREA

Session Th1D - MEMS CMOS Integration

Windemere Z

08:30 - 09:00

INVITED PRESENTATION

Th1D.01 ENHANCING MEMS PERFORMANCE THROUGH CMOS INTEGRATION: THE CASE OF PMUTS
Núria Barniol Beumala
Universitat Autònoma de Barcelona, SPAIN

09:00 - 09:15

Th1D.02 CMOS-COMPATIBLE STRATEGY FOR TRANS-SCALE STRUCTURES VIA OPTICALLY PROGRAMMABLE SELF-ASSEMBLY
Zhi-Qi Dong, Kai-Ming Hu, Rui-Jia Xiang, Tian-Yu Zhao, Jun-Feng Zhou, Guang Meng, and Wen-Ming Zhang
Shanghai Jiao Tong University, CHINA

09:15 - 09:30

Th1D.03 A HIGHLY SENSITIVE CMOS-MEMS INTEGRATED SOC FOR FLOW AND TEMPERATURE SENSING USING A MICROCANTILEVER ARRAY
Feiyun Wang, Xiangyu Song, Linze Hong, and Wei Xu
Shenzhen University, CHINA

09:30 - 09:45

Th1D.04 TOWARD A SELF-POWERED MM-SCALE MEMS SENSOR PLATFORM THROUGH HETEROGENEOUS INTEGRATION OF SCμM AND HV SOI CMOS
Yichen Liu and Kristopher Pister
University of California, Berkeley, USA

09:45 - 10:00

Th1D.05 STACKED TEMPERATURE AND HUMIDITY SOC WITH ENHANCED SENSITIVITY AND LOW HYSTERESIS VIA CMOS-MEMS INTEGRATION
Yubin Ma, Linze Hong, Ruining Xu, Mengliang Jia, and Wei Xu
Shenzhen University, CHINA

10:00 – 10:30 **Break and Exhibit Inspection**

Session Th2A - Cellular Systems

Windemere W

10:30 - 10:45

Th2A.01 VISUAL FEEDBACK SYSTEM FOR ROTATIONAL ANGLE CONTROL OF A SINGLE CELL BASED ON VIBRATION-INDUCED FLOW
Hatsuhiko Ishiguro, Masatomo Arai, Hiroyasu Kobayashi, and Takeshi Hayakawa
Chuo University, JAPAN

10:45 - 11:00

Th2A.02 HIGH-QUALITY IMAGING FLOW CYTOMETRY BASED ON ACOUSTIC FOCUSING AND ITS APPLICATION IN LABEL-FREE LEUKOCYTE DIFFERENTIAL COUPLED WITH DEEP NEURAL NETWORK
Xukun Huang[1], Xiao Chen[1], Junbo Wang[1], Xuzhen Qin[2], Xiaoye Huo[1], Nan Li[1], and Jian Chen[1]
[1]Chinese Academy of Sciences, CHINA and [2]Peking Union Medical College Hospital, CHINA

11:00 - 11:15

Th2A.03 EFFECT OF TITANIUM DIOXIDE NANOPARTICLES ON REACTIVE OXYGEN SPECIES GENERATION IN A HIGH-FREQUENCY ULTRASOUND RANGE
Kotaro Fujishiro[1], Satoshi Okada[2], Takahiro Kuchimaru[3], and Yuta Kurashina1
[1]Tokyo University of Agriculture and Technology, JAPAN, [2]Institute of Science Tokyo, JAPAN, and [3]Jichi Medical University, JAPAN

11:15 - 11:30

Th2A.04 A 3D-PRINTED FLEXIBLE DEVICE FOR MEASURING CONCENTRIC CONTRACTILE FORCE IN IN-VITRO SMOOTH MUSCLE TISSUE MODEL
DongWoo Lee, Byeongwook Jo, Minghao Nie, and Shoji Takeuchi
University of Tokyo, JAPAN

11:30 - 11:45

Th2A.05 A HIGH-SENSITIVITY AND CLOGGING-FREE MICROFLUIDIC IMPEDANCE FLOW CYTOMETER ENABLED BY VIRTUAL CONSTRICTION MICROCHANNEL
Xiao Chen[1], Yimin Li[1], Tingxuan Fang[1], Jie Zhang[2], Yueying Li[2], Xuzhen Qin[3], Junbo Wang[1], Xiaoye Huo[1], Jian Chen[1], and Nan Li[1]
[1]Chinese Academy of Sciences, CHINA, [2]China National Center for Bioinformation, CHINA, and [3]Peking Union Medical College Hospital, CHINA

11:45 - 12:00

Th2A.06 QUANTITATIVE NANO-ARTIFACTS EXPOSURE TOWARD SINGLE CELLS UTILIZING A MICRODROPLET-BASED MICROFLUIDIC SYSTEM
Ren Takeuchi[1], Makoto Saito[1], Rinko Kurogi[1], Nariaki Kiyama[1], Yoko Yamanishi[1], Kosuke Dodo[2], Takashi Kamatani[3], Yoshitaka Shirasaki[4], Chia-Hung Dylan Tsai[5], Satoshi Yotsumoto[4], Niko Kimura[4], Shigeo S. Sugano[6], and Shinya Sakuma[1]
[1]Kyushu University, JAPAN, [2]RIKEN, JAPAN, [3]Institute of Science Tokyo, JAPAN, [4]University of Tokyo, JAPAN, [5]National Yang Ming Chiao Tung University, TAIWAN, and [6]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

Session Th2B - Fabrication & Functional Materials

Windemere X

10:30 - 10:45

Th2B.01 EDIBLE WIRELESS CAPSULE SENSOR FOR SENSING GASTRIC DIGESTIVE FUNCTION BY ELECTROMAGNETIC RESPONSE OF SPLIT-RING RESONATOR WITH VEGETABLE SHEET
Shion Miura[1], Tetsuo Kan[2], and Hiroaki Onoe[1]
[1]Keio University, JAPAN and [2]University of Electro-Communications, JAPAN

10:45 - 11:00

Th2B.02 WAFER-LEVEL MICROFABRICATION OF ZIPPING ELECTROHYDRAULIC ACTUATORS FOR SOFT MILLI-ROBOTS
Shai Shmulevich, Florian Hartmann, and Herbert Shea
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

11:00 - 11:15

Th2B.03 RESILIENT AND LONG-LASTING LIVING MATERIALS: BRIDGING ELECTRONICS AND BIOLOGICAL SYSTEMS
Ruohan Zhang, Yang Gao, and Seokheun Choi
State University of New York, Binghamton, USA

11:15 - 11:30

Th2B.04 NOVEL FABRICATION SCHEME USING LATERAL STACKING OF HYBRID PIEZO/FERROELECTRIC THIN-FILMS FOR MEMS RESONATORS
Linet Thomas C[1], Praveen Kumar[1], Sambuddha Khan[2], and Gayathri Pillai[1]
[1]Indian Institute of Science, INDIA and [2]Tyndall National Institute, IRELAND

11:30 - 11:45

Th2B.05 HIGH ASPECT RATIO 3D CARBON MICROSTRUCTURE FOR INFRARED EMITTER USING PARYLENE CARBONIZATION
Ryo Yoshitake, Shunsuke Yamada, Shuji Tanaka, and Takashiro Tsukamoto
Tohoku University, JAPAN

11:45 - 12:00

Th2B.06 A FULLY MEMS-COMPATIBLE PROCESS FOR ULTRA-THIN PIEZOELECTRIC ACTUATORS WITH GOOD UNIFORMITY AND HIGH COUPLING EFFICIENCY
Aocheng Bao, Chong Yang, Kai Yang, Xili Wang, Yufeng Gao, and Yipeng Lu
Peking University, CHINA

Session Th2C - Accelerometers & Gyroscopes

Windemere Y

10:30 - 10:45

Th2C.01 FROM STRESS TO SUCCESS: DEMONSTRATING ULTRAHIGH QUALITY FACTOR DUAL-SHELL RESONATOR GYROSCOPES WITH LOW STRESS TOPOLOGY
Lois Meira Lopez, Austin R. Parrish, Esther Wong, Danmeng Wang, and Andrei M. Shkel
University of California, Irvine, USA

10:45 - 11:00

Th2C.02 AN ELECTROCHEMICAL ACCELEROMETER WITH OVER 1K FREQUENCY BANDWIDTH AND HIGH SENSITIVITY
Xiaoyu Qi, Nan Zhang, Yan Zhao, Wangnan Chen, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

11:00 - 11:15

Th2C.03 HIGH SENSITIVITY AND WIDE BANDWIDTH IN MULTI-MASS MEMS ACCELEROMETERS
Inês S. Garcia[1], Mubasher Saleem[1], Filipa C. Mota[1], Nélson Castro[1], Pablo Valentim[1], Rui Madeira[2], Alexandre Correia[2], Diogo E. Aguiam[1], Rosana A. Dias[1], and Filipe S. Alves[1]
[1]INL - International Iberian Nanotechnology Laboratory, PORTUGAL and
[2]BoschCar Multimédia, PORTUGAL

11:15 - 11:30

Th2C.04 TWO-DIMENSIONAL PHONONIC CRYSTALS FOR HIGH-SENSITIVITY ACCELERATION SENSING
Xu Guo[1], Kunyang Zhang[1], Jintao Ni[1], Ye Jiang[1], Jiehe Wang[1], Yajiang Yin[2], Wenshuai Lu[2], Bo Ma[1], and Zheng You[1]
[1]Huazhong University of Science and Technology, CHINA and [2]Tsinghua University, CHINA

11:30 - 11:45

Th2C.05 A CLOSED LOOP NEAR-ZERO STIFFNESS MEMS ACCELEROMETER BASED ON ELECTROTHERMAL BUCKLING

Yiwei Ge[1,2], Tiantian Huang[1], Hussein Hussein[3], Yuan Wang[4], Zhijuan Zhu1, Michael Kraft[2], Zhuoyue Zheng[4], and Chen Wang[2]
[1]Zhejiang University, CHINA, [2]Katholieke Universiteit Leuven, BELGIUM, [3]American University of Beirut, LEBANON, and [4]University of Macau, CHINA

11:45 - 12:00

Th2C.06 DIAMAGNETIC LEVITATION OF GYROSCOPES WITH DYNAMIC CONTROL

Mahtab Shakibmanesh, Lois Meira, Mark Jiang, Naji Tarabay, Andrei Shkel, and Camilo Velez
University of California, Irvine, USA

Session Th2D - Mixed

Windemere Z

10:30 - 10:45

Th2D.01 EXPERIMENTAL EVIDENCE OF TWO COMPETING EFFECTS IN THE NONLINEAR RESPONSE OF CANTILEVER BEAMS

Eliya Salman[1], Michael Feldman[1], Chun-Yu Chou[2], David Rosenstock[1], Danny Kassie[1], Sheng-Shian Li[2], and David Elata[1]
[1]Technion - Israel Institute of Technology, ISRAEL and [2]National Tsing Hua University, TAIWAN

10:45 - 11:00

Th2D.02 ELECTRONICS INSENSITIVE TRACKING FOR ULTRA-STABLE MEMS FREQUENCY REFERENCES

Jie Yan[1], Jintark Kim[1], Rakibul Islam[1], Jiheng Jing[1], Karim Elmeligy[1], Jiawei Yang[2], Thomas W. Kenny[2], Paven K. Hanumolu[1], and Gaurav Bahl[1]
[1]University of Illinois, Urbana-Champaign, USA and [2]Stanford University, USA

11:00 - 11:15

Th2D.03 SUSTAINED AC PLASMA GENERATION AT LOW VOLTAGE USING A MINIATURIZED HIGH-Q ROSEN TRANSFORMER

Justin R. Phelps and Reza Abdolvand
University of Central Florida, USA

11:15 - 11:30

Th2D.04 CHARACTERIZATION OF MICROREACTORS FOR NANOPARTICLE SYNTHESIS

Avery E. England, Scott D. Collins, Michael D. Mason, and Rosemary L. Smith
University of Maine, USA

11:30 - 11:45

Th2D.05 OPTIMIZING DUAL APTAMER BINDING ASSAYS FOR C-REACTIVE PROTEIN (CRP) BY BIOSTATISTICAL ANALYSIS, 3D MOLECULAR SIMULATIONS, AND SELECTION ON AN INTEGRATED MICROFLUIDIC CHIP

Chih-Hung Wang, To-Wen Chen and Gwo-Bin Lee
National Tsing Hua University, TAIWAN

11:45 - 12:00

Th2D.06 STATIC HYSTERESIS MITIGATION FOR PZT MEMS VARIFOCAL LIQUID LENS

Andrea Vergara, Zhengnan Tang, Yukio Suzuki, and Shuji Tanaka
Tohoku University, JAPAN

12:00 – 12:15 **Transition Break**

Best Paper Award Ceremony and Closing Remarks

12:15 - 12:45

12:45 **Conference Adjourns**

Poster Presentations

Regency S – V & Rotunda

All times are Eastern Standard Time (EST)

Monday, 30 June	14:00 - 16:00
Tuesday, 01 July	14:00 - 16:00
Wednesday, 02 July	15:30 – 17:30

Classification Chart

(last character of poster number)

Actuators and Microsystems
Bio-Sensors and Microsystems Including In-Vitro Medical Applications
Chemical Sensors and Microsystems
Composite Materials, Polymers, and Fabrication Processes
Energy, Power and Thermal Management
Microfluidics Platform Technologies
Nanoscale Materials and Fabrication
Optical and Atomic Transducers
Packaging & Solid-State Materials and Fabrication Processes
Physical Sensors and Microsystems
RF MEMS, Resonators and Oscillators
Wearable and In-Vivo Medical Devices and Microsystems
Late News

Monday - Actuators and Microsystems

M3P.001 4D PRINTING OF ELECTRO-PERMANENT MAGNETS VIA SELECTIVE LASER SINTERING
Naji Tarabay, Mahtab Shakibmanesh, Mark Jiang, and Camilo Velez Cuervo
University of California, Irvine, USA

M3P.002 A HIGH-PERFORMANCE PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCER HEXAGONAL ARRAY UTILIZING SACRIFICIAL LAYER TECHNOLOGY
Yunhao Wang[1,2], Ke Sun[1], Junxiang Cai[2], Yiwei Wang[2], Xiaoyuan Xia[1,3], Yemin Dong[1,3], Yi Sun[1], Tao Wu[1,2], and Xinxin Li[1,2]
[1]Chinese Academy of Sciences, CHINA, [2]ShanghaiTech University, CHINA, and [3]Shanghai Industrial Technology Research Institute (SITRI), CHINA

M3P.003 AN ULTRA-SENSITIVE PMUT EXPLOITING HIGH ORDER MODE FOR LONG DISTANCE AIRBORNE RANGING
Yiwei Wang[1], Ruihong Xiong[1], Xuankai Xu[1], Jiawei Li[1], Lihui Jin[1], Yuxi Wang[1], Fang Chen[2,3], and Tao Wu[1,2,3]
[1]ShanghaiTech University, CHINA, [2]Chinese Academy of Sciences, CHINA, and [3]Shanghai Engineering Research Center of Energy Efficient and Custom AI IC, CHINA

M3P.004 DIRECT BANDWIDTH MEASUREMENTS OF DYNAMIC PRESSURE SENSORS
James L. Lambert and Mina Rais-Zadeh
Jet Propulsion Laboratory, USA

M3P.005 HYDROGEL-POLYMER HYBRID ACTUATOR WITH TUNABLE DEFORMATION BEHAVIOR BY VARYING LATTICE SKELETON
Haruna Kozuki[1], Koki Yoshida[2], Hiroki Yasuga[3], and Yuta Kurashina[1]
[1]Tokyo University of Agriculture and Technology, JAPAN, [2]Institute of Science Tokyo, JAPAN, and [3]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

M3P.006 MICRO-FABRICATED BI-STABLE MECHANICAL SWITCH ACTUATED BY A SINGLE THERMAL ACTUATOR
Xudong Cai[1], Wankai Liu[1], Wing Tung Hui[2], Yuta Kawashima3, Zerui Xu[1], Man Wong[2], Toshiyuki Tsuchiya[3], Renrong Liang[1], and Xiaohong Wang[1]
[1]Tsinghua University, CHINA, [2]Hong Kong University of Science and Technology, HONG KONG, and [3]Kyoto University, JAPAN

M3P.007 PROPELLER OPTIMIZATION OF MICRO FLYING ROBOTS BY DEEP REINFORCEMENT LEARNING
Yuan Gao, Fanping Sui, Wei Yue, and Liwei Lin
University of California, Berkeley, USA

M3P.008 SELF-CLOSING KIRIGAMI GRIPPER FOR GRIPPING OF SOFT OBJECTS
Shingo Terashima and Eiji Iwase
Waseda University, JAPAN

M3P.009 TOWARDS UNVEILING THE HIDDEN DYNAMICS OF BACTERIORHODOPSIN WITH MEMS-BASED ATOMIC FORCE MICROSCOPY
Suyambulingam Subramanian[1], Nicolas Mauran[1], Guillaume Jourdan[2], Ignacio Casuso[3], and Bernard Legrand[1]
[1]Université de Toulouse, FRANCE, [2]CEA-LETI, Université Grenoble-Alps, FRANCE, and [3]INSERM, Université Aix-Marseille, FRANCE

Tuesday - Actuators and Microsystems

T3P.001 A BISTABLE SHAPE MEMORY - THERMOMAGNETIC MICROACTUATOR
Joel Joseph[1], Ruikang Wang[1], Maxim Wischnewski[1], Shuichi Miyazaki[2], and Manfred Kohl[1]
[1]Karlsruhe Institute of Technology, GERMANY and 2University of Tsukuba, JAPAN

T3P.002 A HIGH-SENSITIVITY AIR-COUPLED PMUT WITH FORCE FEEDBACK CONTROL FOR FULL-LOOP RINGDOWN SUPPRESSION AND BANDWIDTH ENHANCEMENT
Tingzhong Xu, Damiano Caponi, Rodrigo Tumolin Rocha, Zhou Da, and Chunlei Xu
Silicon Austria Labs GmbH, AUSTRIA

T3P.003 BISTABLE IN-PLANE SWITCHING BY A NITICU/SI MICROACTUATOR
Gowtham Arivanandhan[1], Elaheh Akbarjenad[2], Alfred Ludwig[2], and Manfred Kohl[1]
[1]Karlsruhe Institute of Technology, GERMANY and [2]Ruhr University Bochum, GERMANY

T3P.004 EXPERIMENTAL EXAMINATION OF RELATIONSHIP BETWEEN POLARIZATION STATES AND PIEZOELECTRIC PROPERTIES OF SC0.3AL0.7N FOR RECONFIGURABLE MEMS DEVICES
Sean Jun Zhong Wong[1,2], Chen Liu[1], and Yao Zhu[1]
[1]Institute of Microelectronics, SINGAPORE and [2]National University of Singapore, SINGAPORE

T3P.005 IN-WATER CHARACTERIZATION OF CAPACITIVE MICROMACHINED ULTRASOUND TRANSDUCERS PRODUCED ON GLASS FOR MEDICAL IMAGING
Chloe Halbach[1,2], Pieter Gijsenbergh[1], Veronique Rochus[1], Xavier Rottenberg[1], David Cheyns[1], and Paul Heremans[1,2]
[1]imec, BELGIUM and [2]KU Leuven, BELGIUM

T3P.006 MONOLTHIC INTEGRATION OF A FILTER FOR SWITCHING DRIVING MOTION IN PIEZOELETRIC MEMS MICROSPEAKER
Tsung-Wen Tsai[1], Chia-Hao Lin[1], Po-Shen Chen[1], Zih-Song Hu[1], Sung-Cheng Lo[2], and Weileun Fang[1]
[1]National Tsing Hua University, TAIWAN and [2]Upbeat Technology Co., Ltd., TAIWAN

T3P.007 RAPID SENSING OF EXTRUSION BASED PRINTED INK PROPERTIES USING GHZ ULTRASONIC IMAGER
Sai Saraswathi Yarajena and Amit Lal
Cornell University, USA

T3P.008 THE MICROSCOPIC BIOPSY DEVICE FOR THE HIGHLY VISCOELASTIC TISSUE BY USING TRANSLATIONAL/ROTATIONAL PIEZO IMPACT DRIVE MECHANISM
Hiroki Kunii, Hirotaka Sugiura, Satoshi Amaya, and Fumihito Arai
University of Tokyo, JAPAN

Wednesday - Actuators and Microsystems

W4P.001 A GLASS-BASED PARAFFIN MICRO ACTUATOR ARRAY FOR ULTRA-LOW FLOWRATE MICROPUMP
Jingzhe Cao, Fade Hu, and Chuan Luo
Tsinghua University, CHINA

W4P.002 A SEMI-ANALYTICAL METHOD FOR COMPREHENSIVE MODELING OF LEVITATING MICRO-SYSTEM ACTUATORS
Kirill Poletkin
Hefei University of Technology, CHINA

W4P.003 CMOS BEOL-COMPATIBLE SEE-SAW MICROELECTROMECHANICAL NON-VOLATILE MEMORY WITH LOW ON-RESISTANCE
Yu-Hyun Shim[1], Tae-Soo Kim[1], Seung-Jun Lee[1], Sung-Ho Kim[1], So-Young Lee[1], Se-Yoon Jung[1], Seung-Been Noh[1], Yong-Bok Lee[2], and Jun-Bo Yoon[1]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA and [2]Chonnam National University, KOREA

W4P.004 HIGH-FREQUENCY AND BROADBAND PZT-BASED PMUT ARRAY WITH NEGATIVE POLING FOR ENHANCED COUPLING EFFICIENCY
Lei Zhao, Chong Yang, Aocheng Bao, Bowen Sheng, Xixin Cao, and Yipeng Lu
Peking University, CHINA

W4P.005 MECHANICALLY-TOUGH FIBRIN-BASED ACTOMYOSIN SOFT ACTUATOR DRIVEN BY ATP
Takuro Kawasumi[1], Koki Yoshida[2], Yuichi Hiratsuka[3], and Hiroaki Onoe[1]
[1]Keio University, JAPAN, [2]Institute of Science Tokyo, JAPAN, and
[3]Japan Advanced Institute of Science and Technology, JAPAN

W4P.006 ON THE DESIGN OF PIEZOELECTRIC MEMS SPEAKERS FOR HIGH RESOLUTION AUDIO APPLICATIONS
Hsu-Hsiang Cheng, Zih-Song Hu, Chia-Hao Lin, Chin Tseng, and Weileun Fang
National Tsing Hua University, TAIWAN

W4P.007 SEALED SILICON CAVITY PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS WITH HIGH FILL FACTOR
Jiashuai Xu[1], Yiwei Wang[2], Xiaoya Duan[1], Tao Wu[2], and Yansong Yang[1]
[1]Hong Kong University of Science and Technology, HONG KONG and [2]ShanghaiTech University, CHINA

W4P.008 THERMAL STRESS TUNING OF BISTABLE PIEZOELECTRIC MEMS MEMBRANES TO MAXIMIZE DYNAMIC DEFLECTIONS TOWARDS HIGHEST SWITCHING PROBABILITY
Philipp Moll, Shareena Muringakodan, Ulrich Schmid, and Michael Schneider
TU Wien, AUSTRIA

Monday - Bio-Sensors and Microsystems Including In-Vitro Medical Applications

M3P.010 ADVANCED DIGITAL MICROFLUIDIC PLATFORM WITH INTEGRATED SERS SENSOR FOR ON-SITE PROCESSING AND DETECTION
Wenbo Dong, Rongxin Fu, Qian Yu, and Shuailong Zhang
Beijing Institute of Technology, CHINA

M3P.011 CMOS-BASED MULTIMODAL IMAGE SENSOR ENABLING SIMULTANEOUS DISSOLVED OXYGEN AND HYDROGEN ION MEASUREMENT
Yuto Ishii, Hideo Doi, Tomoko Horio, Yoshiko Noda, Daisuke Akai, Ken Hizawa, Yong joon Choi, Kazuhiro Takahashi, Toshihiko Noda, and Kazuaki Sawada
Toyohashi University of Technology, JAPAN

M3P.012 DESIGN, FABRICATION, AND CHARACTERIZATION OF ALLOGRAFT REGENERATIVE PERIPHERAL-NERVE INTERFACES (A-RPNI)
Bassam M. Smadi[1,2], Kenneth A. Fluker[1], Matthew Schiefer[2], Harvey W M. Chim[3], and Jack W. Judy[1]
[1]University of Florida, USA, [2]Malcom Randal Veterans Affairs Medical Center, USA, and
[3]Louisiana State University, USA

M3P.013 EFFECT OF ELECTRODE ARRANGEMENT ON TRANSDERMAL GLUCOSE EXTRACTION AND DETECTION BY REVERSE IONTOPHORESIS
Youhao Liu, Xingguo Zhang, Hao Zheng, Wangwang Zhu, Wenjun Li, Chengcheng Li, Zhongxu Zhou, Dachao Li, and Zhihua Pu
Tianjin University, CHINA

M3P.014 HIGH ASPECT RATIO 3D PRINTED COPPER PILLARS WITH INTEGRATED PIEZORESISTORS FOR HIGH SENSITIVITY FORCE SENSING
Isha Lodhi, Hang Chen, Devin K. Brown, Durga R. Gajula, and Azadeh Ansari
Georgia Institute of Technology, USA

M3P.015 INTEGRATING MINI-VALVES WITH ELECTRONICS/OPTICS IN A PORTABLE DEVICE FOR VIRUS DETECTION AT THE POINT-OF-CARE
George Adedokun, Gurjit Sidhu, Morteza Alipanah, Gary Wang, and Z. Hugh Fan
University of Florida, USA

M3P.016 RAPID MULTIPLEX DETECTION OF VIRAL PATHOGENS IN WHOLE BLOOD USING MICROFLUIDIC SAMPLE PROCESSOR AND SMARTPHONE-LINKED HANDHELD INSTRUMENT
Amanda Bacon, Han KeunLee, Katie Koprowski, Hieu Hoang, Ninawa Odicho, Yasmine Sidavi, Weijing Wang, Minh Do, Enrique Valera, Rashid Bashir, and Brian T. Cunningham
University of Illinois, Urbana-Champaign, USA

M3P.017 THREE-LAYERED HYDROGEL MICROFIBER FOR MAINTAINING ENCAPSULATED FIBER-SHAPED MUSCLE-TISSUE
Shohei Sasaki and Hiroaki Onoe
Keio University, JAPAN

M3P.018 WEARABLE MICRONEEDLE-INTEGRATED DISTANCE-BASED PAPER DEVICE FOR TRANSDERMAL CORTISOL AND DOPAMINE MONITORING
Danilo M. dos Santos, Kawin Khachornsakkul, and Sameer Sonkusale
Tufts University, USA

Tuesday - Bio-Sensors and Microsystems Including In-Vitro Medical Applications

T3P.009 3D TISSUE MODELS WITH PENETRATING SENSORY NEURONS TOWARDS INNERVATED CULTURED SKIN
Tingyu Li, Xueer Fei, Minghao Nie, and Shoji Takeuchi
University of Tokyo, JAPAN

T3P.010 AI/ML BASED DESIGN OPTIMIZATION & FABRICATION OF ALN PIEZO-CANTILEVER ARRAY FOR COCHLEAR IMPLANT APPLICATION
Anju Sebastian, Pavitra Jain, Naveen D'Souza N, and Saurabh ARUN. Chandorkar
Indian Institute of Science, INDIA

T3P.011 CMOS-COMPATIBLE BIOSENSING PLATFORM FOR MULTIPLEXED LACTATE AND PH MONITORING IN LOW-VOLUME BIOSAMPLES
Lotte De Schrijver[1], Wim Sijbers[2], Ali Saeidi[3], Qiuyang Lin[2], and Adrian M. Ionescu[1]
[1]École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and [2]imec, BELGIUM, [3]Xsensio SA, SWITZERLAND

T3P.012 DETECTION OF SMALL EXTRACELLULAR VESICLE SUBPOPULATIONS USING A SILICON NANOWIRE FIELD-EFFECT TRANSISTOR BIOSENSOR
Meiyan Qin, Rui Jiang, Zizhen Wang, Jun Cheng, Yimin Shi, Lingqian Zhang, Yang Zhao, Haiyang Mao, Qingzhu Zhang, Mingxiao Li, and Chengjun Huang
Chinese Academy of Sciences, CHINA

T3P.013 ELECTROKINETIC-BASED MICRO-NANOFLUIDIC DEVICE FOR SARCOMA EXTRACELLULAR VESICLE ISOLATION FOR RAPID POINT-OF-CARE DETECTION
Premanshu K. Singh, Ali F. Usmani, Patricia Sarchet, Federica Calore, Debmalya Halder, Raphael E. Pollock, and Shaurya Prakash
Ohio State University, USA

T3P.014 HYDROGEL MICROWELL ARRAYS FOR OLFACTORY CELL SENSOR IN AMBIENT ENVIRONMENT.
Shino Fujioka[1], Jin Xing[1], Chisaki Yamagata1, Hiroaki Onoe[1], and Koji Sato[2]
[1]Keio University, JAPAN and [2]University of Tokyo, JAPAN

T3P.015 MACHINE LEARNING-AIDED MULTIFUNCTIONAL MICROFLUIDIC PLATFORM WITH SERF ATOMIC MAGNETOMETERS FOR ACCURATE AND SENSITIVE CARDIOVASCULAR BIOMARKER DIAGNOSIS
Bo Bao, Yuqian Zhao, Xinran Tian, Ridong Wang, and Dachao Li
Chinese Academy of Sciences, CHINA

T3P.016 SCALABLE MULTICHANNEL DIAMOND ELECTRODES FOR NEUROCHEMICAL RECORDING

James R. Siegenthaler[1,2], Nick J. Lorenz[1,3], Viktor Oernbratt[1], Brandon Kepros[1], Nikolay Siratskiy[1], Mason L. Perillo[2], G M Hasan UI Banna[2], Robert Rechenberg[1], Michael F. Becker[1], Erin K. Purcell[2], and Wen Li[1,2]
[1]Fraunhofer USA, USA, [2]Michigan State University, USA, and [3]Karlsruhe Institute of Technology, USA

T3P.017 TITANIUM NITRIDE-BASED CMOS ION IMAGE SENSOR WITH 4.19 µM RESOLUTION FOR BIOIMAGING

Zhi Shun Chew, Hideo Doi, Tomoko Horio, Yong Joon Choi, Kazuhiro Takahashi, Toshihiko Noda, and Kazuaki Sawada
Toyohashi University of Technology, JAPAN

T3P.018 WIDE LINEAR DETECTION RANGE GLUCOSE BIOSENSOR BASED ON COMPOSITE BIOACTIVE FILMS

Zening Li[1], Lin Zhou[1], Rongtao Zhang[2], Jianlong Zhao[1], and Hongju Mao[1]
[1]Chinese Academy of Sciences, CHINA and [2]Tianjin University, CHINA

Wednesday - Bio-Sensors and Microsystems Including In-Vitro Medical Applications

W4P.009 A STANDARDIZED REUSABLE MULTIORGAN-ON-A-CHIP WITH ORAL AND BRAIN MODELS LINKED BY VASCULAR FLOW

Chen Chen[1,2], Lin Zhou[1], Huiying Liu[2], and Hongju Mao[1]
Chinese Academy of Sciences, CHINA and Dalian Medical University, CHINA

W4P.010 "CELL-CAPTURE PITFALL" BY TWO-LAYERED MICRO WELL ARRAY DEVICE FOR SINGLE-CELL DERIVED EXOSOME ANALYSIS

Tomoharu Nakazato[1], Chisaki Yamagata[1], Yuto Hamazaki[2], Ayuko Hoshino[2], and Hiroaki Onoe[1]
[1]Keio University, JAPAN and [2]University of Tokyo, JAPAN

W4P.011 CORROSION PROTECTION OF MAGNETOELASTIC SENSORS FOR ENHANCING LIFETIME IN WIRELESSLY INTERROGATED BILIARY STENTS

Zeyu Li, Ramprasad M. Nambisan and Yogesh B. Gianchandani
University of Michigan, Ann Arbor, USA

W4P.012 DYNAMIC FLOW-CONTROLLLED 3D-PRINTED CHIP WITH PUSH-PULL DESIGN FOR VASCULARIZED CARCINOMA ORGANOIDS

Xinzhuo Gao[1,2], Shuang Li[3], Feiyun Cui[2], Qin Zhou2, Jianan Hui[1], and Hongju Mao[1]
[1]Chinese Academy of Sciences, CHINA, [2]Harbin Medical University, CHINA, and [3]Tianjin University, CHINA

W4P.013 FABRICATION OF SOFT AND TRANSPARENT 3D MICROELECTRODE ARRAYS FOR IN VITRO ELECTROPHYSIOLOGICAL RECORDING

Debarun Sengupta[1,2], Hande Aydogmus[1], Pratik Tawade[1], Shriya Rangaswamy[1], Jean-Philippe Frimat[3], and Massimo Mastrangeli[1]
[1]Delft University of Technology (TU Delft), NETHERLANDS,
[2]Shiv Nadar Institution of Eminence, INDIA, and
[3]Leiden University Medical Center, NETHERLANDS

W4P.014 IN VITRO INVESTIGATION OF LUNG CONNECTIVE TISSUE STIFFNESS UNDER VARIOUS OXYGEN TENSIONS AND GRADIENTS

Heng-Hua Hsu[1], Ping-Liang Ko[1,2], Dao-Ming Chang[1], and Yi-Chung Tung[1]
Acdemia Sinica, TAIWAN and National Taiwan University, TAIWAN

W4P.015 ON-SITE STERILIZATION OF SMALL MEDICAL DEVICES USING DBD-GENERATED REACTIVE SPECIES AND DISPOSABLE INDICATOR

Dai-En Li and Che-Hsin Lin
National Sun Yat-sen University, TAIWAN

W4P.016 SURFACE-ENHANCED RAMAN SPECTROSCOPY MEASUREMENTS OF DNA WITH A SINGLE NUCLEOTIDE SPATIAL RESOLUTION AND SENSITIVITY
Tomoya Shinabe, Shintaro Yotsuzuka, Akio Uesugi, Hiroaki Honma, Koji Sugano, andYoshitada Isono
Kobe University, JAPAN

W4P.017 WEARABLE AND BREATHABLE SENSOR FOR REAL-TIME PLANT MOISTURE MONITORING
Yuanyuan Huang, Mingfu Xiao, Xiaoqi Zhou, Yi Tian, and Juntao Zhu
Southwest University, CHINA

W4P.018 WIRELESSLY INTERROGATABLE, BIOCOMPATIBLE, IMPLANTABLE SENSOR FOR RAPID DETECTION OF PH IN EARLY ANASTOMOTIC LEAKAGE DIAGNOSIS: A PATH TOWARDS BIODEGRADABLE SOLUTIONS
Chinaza Ogbonna, Yuheng He, Nima Ghalichechian, and Luke Beardslee
Georgia Institute of Technology, USA

Monday - Chemical Sensors and Microsystems

M3P.019 3D-PRINTED MICRO-LATTICE GOLD ELECTRODE FOR EVALUATING REAGENT RELEASE PROPERTIES
Satoshi Amaya[1], Mizuki Maeda[2], Hirotaka Sugiura[1], Fumihito Arai[1], and Hiroaki Sakamoto[2]
[1]University of Tokyo, JAPAN and [2]Fukui University, JAPAN

M3P.020 A SENSOR ARRAY WITH FUNCTIONALIZED GOLD NANOPARTICLES FOR DETECTION OF TOXIC VOLATILE ORGANIC COMPOUNDS IN AIR
Sujoy Halder, Prasadanie K. Adhihetty, Michael H. Nantz, and Xiao-An Fu
University of Louisville, USA

M3P.021 AN INTEGRATED INTELLIGENT SENSING PLATFORM FOR SPECIFIC IDENTIFICATION OF BIOCHEMICAL SUBSTANCES
Yusa Chen[1], Dingbang Liu[1], Yunhao Cao[1], Hongshun Sun[1], Dingyi Yang[2], and Wengang Wu[1]
[1]Peking University, CHINA and [2]Shandong University, CHINA

M3P.022 ELECTRO-THERMAL-DRIVEN GRAPHENE RESONANT SENSOR FOR HIGHLY SENSITIVE VIRUS DETECTION
Viet Khoa Pham[1], Homare Yoshida[1], Sachiko Sakai[1], Ippei Akita[2], Yuki Imaizumi[3], Tatsuro Goda[3], Yong-Joon Choi[1], Toshihiko Noda[1], Kazuaki Sawada[1], and Kazuhiro Takahashi[1]
[1]Toyohashi University of Technology, JAPAN,
[2]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and
[3]Toyo University, JAPAN

M3P.023 FUNCTIONALIZED TITANIUM CARBIDE-POLYMER NANOFIBER COMPOSITES VIA ELECTROSTATIC ASSEMBLY FOR ROOM-TEMPERATURE SUB-PPM NO_ SENSING
Seungjin Yang[1], Eunhwan Jo[2], and Jaesam Sim[1]
[1]Korea Institute of Industrial Technology, KOREA and
[2]Kumoh National Institute of Technology, KOREA

M3P.024 HIGHLY SENSITIVE AND SELECTIVE PHOTONIC CRYSTAL-MOF COMPOSITE FLUORESCENT SENSOR FOR NEUROTOXIN DETECTION
Wenxing Xu[1], Jiayue Han[1], Jiangong Cheng[1], and Yanyan Fu[1]
Chinese Academy of Sciences, CHINA

M3P.025 LITHOGRAPHY-FREE FABRICATION OF BIMORPH NANOSTRUCTURAL CHEMOMECHANICAL SWITCHES FOR HYDROGEN DETECTION WITH NEAR-ZERO STANDBY POWER CONSUMPTION
Daeyeon Koh[1], Eunhwan Jo[2], and Jongbaeg Kim[1]
[1]Yonsei University, KOREA and [2]Kumoh National Institute of Technology, KOREA

M3P.026 MEASURING THE REACTION HEAT BETWEEN PALLADIUM-GOLD ALLOY NANOPARTICLES AND HYDROGEN MOLECULES USING MEMS THERMOPILE CHIPS
Shaokui Tan[1,2], Zechun Li[1], Ming Li[1], Muyu Yan[1], Pengcheng Xu[1], and Xinxin Li[1]
[1]Chinese Academy of Sciences, CHINA and [2]Shanghai Normal University, CHINA

M3P.027 QUANTITATIVE ASSESSMENT OF CORROSION KINETICS OF SINGLE SILVER NANOWIRES INDUCED BY NO2 MOLECULES USING RESONANT CANTILEVERS
Muyu Yan[1], He Wang[1], Xianjun Rong[2], Qiaoyuan Yang[1], Ming Li[1], Ding Wang[2], Pengcheng Xu[1], and Xinxin Li[1]
[1]Chinese Academy of Sciences, CHINA and [2]University of Shanghai for Science and Technology, CHINA

M3P.028 RESOLVING NO2, O3, AND H2O CONCENTRATIONS IN GAS MIXTURES WITH DUAL CNT-FET SENSORS AND MACHINE LEARNING
Cristina Gentili, Cosmin I. Roman, Ines Kraiem, and Christofer Hierold
ETH Zürich, SWITZERLAND

M3P.106 CHARGE AND CAPACITANCE SENSITIVE FIELD EFFECT DEVICE (CCSFET) FOR MEASUREMENTS IN GASES AND LIQUIDS
Jamila Boudaden[1], Karl Neumeier[1], and Ignaz Eisele[1,2]
[1]Fraunhofer EMFT, GERMANY and [2]University of the Bundeswehr Munich, GERMANY

Tuesday - Chemical Sensors and Microsystems

T3P.019 A MACHINE LEARNING-DRIVEN MULTIMODAL SENSING SYSTEM FOR ADVANCED MOLD DETECTION
Anwar Elhadad, Nicolette Cascioli, Yang Gao, and Seokheun Choi
State University of New York, Binghamton, USA

T3P.020 A SINGLE PMUT-BASED SENSING SYSTEM FOR THE SIMULTANEOUS MEASUREMENT OF LIQUID LEVEL AND CONCENTRATION
Long Zhang[1,2], Yunfei Gao[1,2], and Liang Lou[1,2]
[1]Shanghai University, CHINA and [2]Shanghai Industrial Technology Research Institute, CHINA

T3P.022 EXPERIMENTAL VERIFICATION OF NOX GAS DYNAMICS AND KINETICS ON CARBON NANOTUBE (CNT) FIELD EFFECT TRANSISTOR GAS SENSORS
Ines Kraiem, Cosmin I. Roman, Cristina Gentili, Miroslav Haluska, and Christofer Hierold
ETH Zürich, SWITZERLAND

T3P.023 GAS CHROMATOGRAPHIC COLUMN WITH IN-SITU GROWING POROUS SILICON NANOSTRUCTURES AS STATIONARY PHASE SUPPORT LAYER
Wenbo Li, Yuchen Zhu, Shaojie Ma, and Fei Feng
Chinese Academy of Sciences, CHINA

T3P.024 LARGE BANDWIDTH FLUORESCENCE SPECTRUM IN SITU SENSING CHIP BASED ON ANTISYMMETRIC AWG DESIGN
He Li[1], Bo Wang[1], Jiangong Cheng[1], Chang Chen[1,2], Huizi Li[1], Yanyan Fu[1], Huan Liu[1], and Yaorong Xiahou[2]
[1]Chinese Academy of Sciences, CHINA and [2]Shanghai University, CHINA

T3P.025 LOW-COST DISPOSABLE MICROGLOW DISCHARGE CHIP ON PAPER SUBSTRATE FOR AQUEOUS SAMPLE ANALYSIS
Manjeet Kumar and Bhaskar Mitra
Indian Institute of Technology Delhi, INDIA

T3P.026 MEMS GAS SENSOR ARRAYS WITH MULTILAYER OF NANOMATERIALS PATTERNED BY WAFER-LEVEL PHOTOLITHOGRAPHY PROCESS
Xitong Sun, Jin Li, Tongheng Cheng, and Fei Wang
Southern University of Science and Technology, CHINA

T3P.027 RAPID DETECTION OF METHAMPHETAMINE USING MXENE MODIFIED ELECTROCHEMICAL SENSOR
Ri Wang
Chinese Academy of Sciences, CHINA

T3P.028 TERAHERTZ METASURFACE BASED ON QUASI-BIC FOR FINGERPRINT SPECTRUM RETRIEVAL OF TRACE ANALYTES
Zijian Cui[1], Wenshuo Chen[2], Yue Wang[2], and Xiaoguang Zhao[1]
[1]Tsinghua University, CHINA and [2]Xi'an University of Technology, CHINA

Wednesday - Chemical Sensors and Microsystems

W4P.019 A MEMS ACETONE GAS SENSOR BASED ON ZNO NANOPINE FORESTS WITH LOW POWER CONSUMPTION
Huabin Yang, Qirui Zhang, Xin Liu, Na Zhou, and Haiyang Mao
Chinese Academy of Sciences, CHINA

W4P.020 AN AUTOMATED ELECTROCHEMICAL MICROFLUIDIC SENSING PLATFORM FOR CONTINUOUS HEAVY METAL ANALYSIS IN WATER/SOIL RESERVOIRS
Mohammad Kafi Kangi[1], Vianney Medina-Gonzalez[1,2], Pramod Gupta[2], Tumi Olason[2], Hevar Djeza[2], Nathan Grimmer[2], Zebin Jiang[1], James R. Siegenthaler[1,2], and Wen Li[1,2]
[1]Michigan State University, USA and [2]Fraunhofer USA, USA

W4P.022 FLEXIBLE TACTILE-OLFACTORY FUSION GLOVE FOR GESTURE RECOGNITION AND COMBUSTIBLE DETECTION IN COMPLEX ENVIRONMENT
Jiachuang Wang, Nan Qin, and Tiger H. Tao
Chinese Academy of Sciences, CHINA

W4P.023 HIGHLY SENSITIVE NO2 GAS SENSORS BY NANOPARTICLE DECORATION OF CVD GRAPHENE
Mudassir Husain[1], Leandro N. Sacco[1], Nigel Rising[2], Elias Torres[3], and Sten Vollebregt[1]
[1]Delft University of Technology (TU Delft), NETHERLANDS, [2]VSPARTICLE, NETHERLANDS, and [3]Graphenea, NETHERLANDS

W4P.024 LITHIUM DETECTION WITH MICROFLUIDIC ELECTROCHEMICAL SENSOR: ENHANCEMENTS BY DEAN FLOW AND LITHIUM MANGANESE OXIDE
Ali Bank, Shapour Jafargholinejad, and Pouya Rezai
York University, CANADA

W4P.025 MEASUREMENT OF EXOCYTOSIS IN LIVING PC12 CELLS USING ELECTROCHEMICAL SENSOR CHIPS REVEALS THE BIOLOGICAL MECHANISMS FOR ANTIPSYCHOTICS
Xuefeng Wang[1], Wenxue Chen[1,2], Zihui Li[1,3], Haoliang Li[1,2], Qiongya Wan[1,3], Dan Zheng[2], Yongheng Zhu[3], Pengcheng Xu[1], and Xinxin Li[1]
[1]Chinese Academy of Sciences, CHINA, [2]Shanghai Institute of Technology, CHINA, and [3]Shanghai Ocean University, CHINA

W4P.026 PROPOSAL FOR RECOVERY METHOD OF PH SENSOR CHARACTERISTIC FLUCTUATION DUE TO CHARGING USING STRIPED GATE ISFETS
Hiroto Takahashi, Shunya Yokoyama, Yoshiharu Naito, Satoshi Ota, and Masato Futagawa
Shizuoka University, JAPAN

W4P.027 RECURRENCE PLOTS-ASSISTED DEEP LEARNING BASED METAL OXIDE SEMICONDUCTOR SENSOR ARRAY SYSTEM
Zezong Shi[1,2], Huizi Li[1], Jiangong Cheng[1], and Yanyan Fu[1]
[1]Chinese Academy of Sciences, CHINA and [2]ShanghaiTech University, CHINA

W4P.028 UV-ASSISTED AMMONIA SENSING AT ROOM TEMPERATURE USING GA2O3/TI3C2TX MXENE COMPOSITE
Dong-Su Kim[1], Goeun Cha[2], Jonghyeon Woo[2], Jeongsik Noh[2], and Jongsung Park[2]
[1]Korea Institute of Industrial Technology, KOREA and 2Kyungpook National University, KOREA

Monday - Composite Materials, Polymers, and Fabrication Processes

M3P.029 A HIGHLY STRETCHABLE, ULTRA-STABLE, AND MULTIFUNCTIONAL LIQUID METAL-BASED TRIBOELECTRIC FIBER
Huiyun Zhang[1], Shengxin Xiang[1], Xiao Wei1, Lei Liu[1], Xinkai Xie[1], Jun Wu[1], Chengkuo Lee[2], and Qiongfeng Shi[1]
[1]Southeast University, CHINA and [2]National University of Singapore, SINGAPORE

M3P.030 ENHANCED STRAIN RESISTANCE OF FRACTAL FIBER LASER-INDUCED GRAPHENE FOR FLEXIBLE ELECTRODES VIA ANNEALING AND PLASMA ETCHING DUAL TREATMENT
Yanru Chen[1], Jiaqi Liu[2], Yixin Liu[2], and Min Zhang[2]
[1]University of California, San Diego, USA, and [2]Tsinghua University, CHINA

M3P.031 MICROFABRICATED BIODEGRADABLE POLY (L-LACTIC ACID) RESONATORS
Quan H. Nguyen, Toan V. Nguyen, and Takahito Ono
Tohoku University, JAPAN

M3P.032 PARYLENE-ENCAPSULATED SELF-HEALING METAL INTERCONNECTS USING SILICONE OIL DISPERSION
Yutaro Fukushima, Akane Umeda, and Eiji Iwase
Waseda University, JAPAN

M3P.033 RAPID PROTOTYPING OF LIQUID METAL-BASED STRETCHABLE ELECTRONICS
Kaushal J. Sumaria and Tingyi Liu
University of Massachusetts, Amherst, USA

M3P.105 OVER 90% REDUCTION OF RESPONSE TIME IN FLEXIBLE MEMS THERMAL SENSOR USING LOCALIZED BACKSIDE LASER ABLATION
Muhammad Salman Al Farisi, Yoshihiro Hasegawa, and Mitsuhiro Shikida
Hiroshima City University, JAPAN

Tuesday - Composite Materials, Polymers, and Fabrication Processes

T3P.029 A MASKLESS, EQUIPMENT-FREE APPROACH FOR FABRICATING TUNABLE MICRO-CONVEX/CONCAVE STRUCTURES USING SELF-ASSEMBLED MICROSPHERES AND PNIPAM HYDROGEL SWELLING
Abbas Jalili and Siyang Zheng
Carnegie Mellon University, USA

T3P.030 FORCE DISTRIBUTION MEASUREMENT OF PLANT ROOT GROWTH USIN GEL MEDIUM EMBEDDED WITH PHOSPHORESCENT BEADS AND SAMPLING MOIRÉ METHOD
Gakuto Kagawa and Hidetoshi Takahashi
Keio University, JAPAN

T3P.031 HIGH TEMPERATURE-FREQUENCY COEFFICIENT ACHIVED IN A FULLY FLEXIBLE SURFACE ACOUSTIC WAVE TEMPERATURE SENSOR
Jingwen Yang, Chunlong Chen, Silin Tang, Xiaoru Li, Xiaoyu Zhou, Huahuang Luo, Qingqing Ke, Zihan Lu, Zhiqing Zhang, and Tingfeng Peng
Sun Yat-sen University, CHINA

T3P.032 POLYIMIDE COPLANAR WAVEGUIDES FOR BROADBAND DIELECTRIC SPECTROSCOPY TO MONITOR EFFECTS OF LONG-TERM FLUID EXPOSURE
Nikolas D. Barrera[1], Jacob T. Pawlik[2], Nathan D. Orloff[2], Christian J. Long[2], James C. Booth[2], Ellis Meng[1], and Angela C. Stelson[2]
[1]University of Southern California, USA and [2]National Institute of Standards and Technology, USA

T3P.033 SELF-HEALING AND STRETCHABLE GRAPHITE-POLYMER COMPOSITES FOR MOTION SENSING AND IMPERCEPTIBLE PULSE MEASUREMENT
Guan-Ze Song
National Sun Yat-sen University, TAIWAN

Wednesday - Composite Materials, Polymers, and Fabrication Processes

W4P.029 BIODEGRADABLE TRANSIENT AIRFLOW SENSOR TOWARD ECO-FRIENDLY IMPLANT FOR RESPIRATION MONITORING
Ryusei Nakamura[1], Muhammad Salman Al Farisi[1], Yoshihiro Hasegawa[1], Miyoko Matsushima[2], Tsutomu Kawabe[2], and Mitsuhiro Shikida[1]
[1]Hiroshima City University, JAPAN and [2]Nagoya University, JAPAN

W4P.030 HETEROGENEOUS FILM ARRAY FABRICATION VIA OVERLAPPING PHOTOLITHOGRAPHY FOR DYNAMIC STRUCTURAL COLORATION
Thiyagarajan Kaliannan, Sungjoon Ji, Hwisu Jeon, and Taesung Kim
Ulsan National Institute of Science and Technology, KOREA

W4P.032 PROXY TEST STRUCTURES FOR IMPROVED HYPERELASTIC MATERIAL PARAMETER ESTIMATION FOR SOFT ROBOTIC COMPONENTS
Florin Püntener, Sira Bielefeldt, Christofer Hierold, and Cosmin Roman
ETH Zürich, SWITZERLAND

W4P.033 SOFT MAGNETIC ACTUATOR USING COMPOSITE ELASTOMER AND ELECTROPERMANENT MAGNETS FOR HAPTIC DISPLAYS
Htoo Wai Htet and Amal El-Ghazaly
Cornell University, USA

Monday - Energy, Power and Thermal Management

M3P.034 A FREQUENCY UP-CONVERTING WIDEBAND VIBRATION ENERGY HARVESTER VIA 1:2 INTERNAL RESONANCE
Haiyang Zhao, Han Gao, Zhujie Zhao, Lijia Zhang, Chunyang Li, Yuanlin Xia, Zhuqing Wang, and Cao Xia
Sichuan University, CHINA

M3P.035 A WEARABLE SKIN CONFORMAL SELF POWERED TATTOO BASED HYDRATION SENSOR USING GRAPHENE AND CLAY NANOSHEET MEMBRANES
Nafize Ishtiaque Hossain, Kundan Saha, Atul Sharma, Wenxin Zeng, and Sameer Sonkusale
Tufts University, USA

M3P.036 EFFICIENT SPACE UTILIZATION OF MAGNETICS FOR WIRELESS ENERGY HARVESTING IN VOLUME-CONSTRAINED APPLICATIONS
Zekun Li and Mark G. Allen
University of Pennsylvania, USA

M3P.037 MICRO-CRATER GROOVED POLYVINYLCHLORIDE TRIBOELECTRIC DEVICE FOR ENERGY HARVESTING AND SELF-POWERED TACTILE SENSING
Kai-Che Lai
National Sun Yat-sen University, TAIWAN

M3P.038 PHYSICAL MECHANISM OF NON-INVASIVE SKIN PENETRATION ENHANCEMENT METHOD BASED ON THERMAL PERMEABILITY EFFECT
Hao Zheng, Xueqin Wang, Zhihua Pu, Youhao Liu, Chengcheng Li, Xingguo Zhang, and Dachao Li
Tianjin University, CHINA

M3P.039 SELF-POWERED SMART FINGER RING BASED ON TRIBOELECTRIC-IONTRONIC HYBRID PRESSURE SENSOR FOR HUMAN-MACHINE INTERFACES
Omar Faruk, Md Asaduzzaman, M. Robiul Islam, Gagan Bahadur Pradhan, Md Shofiul Alam, and Jae Yeong Park
Kwangwoon University, KOREA

M3P.040 TRANSFORMING MOIST-ELECTRIC GENERATORS WITH FUNCTIONAL GROUP-ENRICHED BIOLOGICAL INNOVATIONS
Yang Gao and Seokheun Choi
State University of New York, Binghamton, USA

Tuesday - Energy, Power and Thermal Management

T3P.034 A HIGHLY BREATHABLE AND UNIFORMLY TEMPERATURE-CONTROLLING PATCH WITH BIOMIMETIC STRUCTURE FOR WEARABLE ELECTRONICS
Hao Zheng, Xueqin Wang, Zhihua Pu, Youhao Liu, Chengcheng Li, Xingguo Zhang, and Dachao Li
Tianjin University, CHINA

T3P.035 CMOS-COMPATIBLE ANTIFERROELECTRIC-DIELECTRIC CAPACITORS FOR MULTIFUNCTIONAL ENERGY STORAGE AND TUNABLE ELECTRONICS
Hung-Wei Li, Cyrille Masserey, Niccolò Martinolli, Igor Stolichnov, and Adrian M. Ionescu
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

T3P.036 FERROELECTRIC DIPOLE MOMENT EFFECT-ENHANCED DROPLET-BASED HYDROVOLTAIC POWER GENERATION: A NOVEL STRATEGY FOR HIGH-EFFICIENCY ENERGY CONVERSION
Endian Cui, Fayang Wang, Pengfan Wu, Danni Yang, Chenxi Zhao, Yihui Song, and Xiaojing Mu
Chongqing University, CHINA

T3P.037 MOISTURE-INDUCED ENERGY HARVESTERS BY WATER HARVESTING FOR CONTINUOUS ARID ENVIRONMENT OPERATIONS
Jong Ha Park, Peisheng He, Sujoy K. Ghosh, Fan Xia, Nikita G. Lukhanin, Jundong Zhai, Ryan D. Rundle, and Liwei Lin
University of California, Berkeley, USA

T3P.038 RESONANCE-TUNABLE PIEZOELECTRIC VIBRATION ENERGY HARVESTER WITH CORE-LESS STRUCTURE USING PRISM-ASSISTED 3D LITHOGRAPHY
Kota Morishita[1], Yuji Takata[1], Yuya Tanaka[1], Gen Hashiguchi[2], Hiroshi Toshiyoshi[3], and Takaaki Suzuki[1]
[1]Gunma University, JAPAN, [2]Shizuoka University, JAPAN, and [3]University of Tokyo, JAPAN

T3P.039 SMART MAGENTOELECTRIC FLUXGHUIDE ENABLES WPT SYSTEMS WITH HIGHLY-MISALIGNED COILS
Hidelberto Macedo-Zamudio and Ulrike Wallrabe
Albert Ludwigs Universität, Freiburg, GERMANY

T3P.040 TWO-PHASE IMPINGEMENT COOLING USING NOVEC-649 WITH COPPER-INVERSE-OPAL WICK AND 3D PRINTED MICROCHANNEL MANIFOLD
Shangyang Shi[1], Jianyu Du[1], Zhou Yang[1], Wei Wang[1,2,3], and Chi Zhang[1,2,3]
[1]Peking University, CHINA,
[2]National Key Laboratory of Advanced Micro and Nano Manufacture Technology, CHINA, and
[3]Beijing Advanced Innovation Center for Integrated Circuits, CHINA

Wednesday - Energy, Power and Thermal Management

W4P.034 A MOBILE ROBOT PLATFORM FOR WIRELESS CHARGING OF AGRICULTURAL UNDERGROUND SENSOR NETWORKS
Vernon S. Crasto, Trevor B. Free, Dieter A. Steinhauser, Yiwei Bian, Daniel Pistorino, and David P. Arnold
University of Florida, USA

W4P.035 DUAL SPRING ASSISTED HYBRID ENERGY HARVESTER WITH NON-CONTACT TRIBOELECTRIC VIBRATION SENSOR FOR SELF-SUSTAINABLE VEHICLE IOTS
MoonSeong Jo, Trilochan Bhatta, and Aklesh Teli
Kwangwoon University, KOREA

W4P.036 MAGNETICALLY LEVITATED LOW STOCHASTIC WIND-DRIVEN HYBRID GENERATOR FOR SELF-SUSTAINABLE OUTDOOR IOTS
Aklesh Teli, Trilochan Bhatta, Gagan Bahadur Pradhan, Shital Sharma, and Jae Yeong Park
Kwangwoon University, KOREA

W4P.037 OUTPUT POWER IMPROVEMENT OF RUMEN BACTERIA MICROBIAL FUEL CELLS USING NI-PLATED CONDUCTIVE FOAM
Michitaka Yamamoto[1], Yasutaka Shimizu[1], Jarred W. Fastier-Wooller[1], Yoshihiro Muneta[2], Hiroshi Sawada[2], Shozo Arai[2], and Toshihiro Itoh[1]
[1]University of Tokyo, JAPAN and [2]National Agriculture and Food Research Organization, JAPAN

W4P.039 THERMAL CONDUCTIVITY MEASUREMENT OF TWO-DIMENSIONAL HETEROSTRUCTURES BY TIME DIFFERENTIAL RAMAN TECHNIQUE
Hao Wei, Ying He and Ridong Wang
Chinese Academy of Sciences, CHINA

W4P.040 WATER EVAPORATION-INDUCED POWER GENERATION DEVICE USING CONDUCTIVE POROUS AZO FILMS
Riko Kazama[1], Ayumu Hinata[1], Takahito Ono[1], Ioana Voiculescu[2], and Masaya Toda[1]
[1]Tohoku University, JAPAN and [2]City College of New York, USA

Monday - Microfluidics Platform Technologies

M3P.041 A BIOSENSOR-INTEGRATED FILTRATION DEVICE FOR INTACT HIV ISOLATION AND LABEL-FREE DETECTION IN POINT-OF-CARE ENVIRONMENTS
Leyang Liu[1], Takhmina Ayupova[1], Saurabh Umrao[1], Luke Akin[1], Han-Keun Lee[1], Joseph Tibbs[1], Xing Wang[1], Utkan Demirci[2], and Brian T. Cunningham[1]
[1]University of Illinois, Urbana-Champaign, USA and [2]Stanford University, USA

M3P.042 A MINIATURIZED PLATFORM FOR INVESTIGATING THE STRENGTH OF THROMBUS INDUCED BY BLOOD SHEAR RATES
Dong-Hwi Ham[1], Seong-hyeon Lee[2], Jae-Hyun Choi[1], Ji-Seob Choi[1], Woo-jun Jung[2], Yong-ha Hwang[2], and Woo-Tae Park[1]
[1]Seoul National University of Science and Technology, KOREA and [2]Korea University, KOREA

M3P.043 CONTINUOUS AND SHEATHFLOW-LESS MICRO-/NANOPARTICLE SEPARATION COMBINING THERMOPHORESIS AND THERMOELECTRICITY WITH A 3D SPIRAL MICROCHANNEL
Junho Kim, Hwisu Jeon, and Taesung Kim
Ulsan National Institute of Science and Technology, KOREA

M3P.044 EFFECT OF NANOPARTICLES ON THE SUPPRESSION OF REAGENT EVAPORATION IN SINGLE-PLATE EWOD SYSTEM
Xiaoping Li, Duo Fu, Yifu Xu, Mingrui He, and Caiqin Zhao
Tianjin University, CHINA

M3P.045 EXPERIMENTAL EVALUATION OF MULTI-QUADRILATERAL-PILLAR ARRAY MICROFLUIDIC PLATFORM FOR OOCYTE DENUDATION UTILIZING DEEP-LEARNING APPROACH
Hang Nguyen Thu[1], Trung Nguyen Hoang[1], Anh Nguyen Thi Ngoc[1], Mobina Malekifar[4], Tung Le Thanh[1], Mai Anh Tran[1], Hanh Nguyen Van[2], Ha Tran Thi Thuy[3], Tung Thanh Bui[1], Hoang Anh Phan[1], Hung Cao[4], Trinh Chu Duc[1], and Loc Do Quang[1]
[1] Vietnam National University(VNU), VIETNAM, [2]Vietnam Academy of Science and Technology, VIETNAM, [3]Posts and Telecommunications Institute of Technology, VIETNAM, and [4]University of California, Irvine, USA

M3P.046 HOMOGENIZATION OF SOLUTE CONCENTRATION IN VERTICALLY COALESCENT DROPLETS USING ACOUSTIC WAVE
Yoshinori Miyata, Shinji Bono, and Satoshi Konishi
Ritsumeikan University, JAPAN

M3P.047 INTERACTION OF AN ACCELERATED LIQUID INTERFACE WITH A MESH FOR SATELLITE FREE DROPLET EJECTION.
Imnatoshi Jamir, Bheema S R. Bapuram, and Allu S. Reddy, Prosenjit Sen
Indian Institute of Science, INDIA

M3P.048 MICROFLUIDIC SENSOR FOR MICROPLASTIC DETECTION IN SALINE FRESHWATER: ENHANCEMENTS BY WHEATSTONE BRIDGE AND MXENE-COATED ELECTRODES
Haider Warraich[1], Alireza Zabihihesari[2], Shooka Karimpour[1], and Pouya Rezai[1]
[1]York University, CANADA and [2]Dalhousie University, CANADA

M3P.049 SELF-PRESSURIZING MICROFLUIDIC CHIP FOR BUBBLE SUPPRESSION
Zizhen Wang, Meiyan Qin, Rui Jiang, Haiyang Mao, Yang Zhao, Lingqian Zhang, Mingxiao Li, and Chengjun Huang
Chinese Academy of Sciences, CHINA

Tuesday - Microfluidics Platform Technologies

T3P.041 A DEEP-LEARNING-BASED APPROACH FOR IN VITRO MATURATION MONITORING UTILIZING HEXAGONAL MICROPILLAR TRAP MICROFLUIDIC PLATFORM
Hang Nguyen Thu[1], Anh Nguyen Thi Ngoc[1], Trung Nguyen Hoang[1], Junhan Xiao[4], Tung Le Thanh[1], Hang Nguyen Thi[1], Hanh Nguyen Van[2], Hoang Anh Phan[1], Thien Nguyen Duy[1], Tung Thanh Bui[1], William C. Tang, Hung Cao[4], Trinh Chu Duc[1], and Loc Do Quang[1]
[1]Vietnam National University (VNU) , VIETNAM, [2]Vietnam Academy of Science and Technology, VIETNAM, [3]Posts and Telecommunications Institute of Technology, VIETNAM, and [4]University of California, Irvine, USA

T3P.042 ACOUSTIC LENS INTEGRATED WITH A MICROFLUIDIC DEVICE TOWARD HIGH-POWER AND HIGH-THROUGHPUT CELL MANIPULATION
Souta Kurihara and Takeshi Hayakawa
Chuo University, JAPAN

T3P.043 DETECTION OF MICROPLASTIC WASTE BY USING A NOVEL MICROFLUIDIC SYSTEM WITH AN INTEGRATED OBJECT TRACKING ALGORITHM
Bushra B. Khalak[1], Doruk Durmaz[1], Okan Külekçıo_lu[1], Ela Bah_i[1], Selin Kasap[1], Guleda O. Engin[4], Emine U. Sarita_[1,3], and and Emine Y. Erdem[1,2]
[1]Bilkent University, TURKEY, [2]UNAM (National Nanotechnology Research Center), TURKEY, [3]UMRAM (National Magnetic Resonance Research Center), TURKEY, and [4]Yildiz Technical University, TURKEY

T3P.044 EFFICIENT HYDROPHILIC ARRAY GENERATION USING ULTRASONIC ATOMIZATION AND OFF-THE-SHELF PERFORATED MASKS
Xiaochen Lai, Xicheng Wang, Yanfei Sun, and Yong Zhu
Nanjing University of Information Science & Technology, CHINA

T3P.045 FULLY 3D-PRINTED, TRIAXIAL ELECTROSPRAY MICROFLUIDICS FOR UNIFORM CORE-SHELL-SHELL MICROPARTICLE GENERATION
Bryan I. Quintanar[1,2] and Luis F. Velasquez-Garcia[2]
[1]Tecnológico de Monterrey, MEXICO and [2]Massachusetts Institute of Technology, USA

T3P.046 HYBRID DIW-SLA TISSUE PRINTING SYSTEM WITH A MULTI-MATERIAL MICROFLUIDIC NOZZLE PRINTHEAD
Rifat H. Chowdhury[1], Shunya Okamoto[1], Takayuki Shibata[1], Tuhin S. Santra[2], and Moeto Nagai[1]
[1]Toyohashi University of Technology, JAPAN and [2]Indian Institute of Technology Madras, INDIA

T3P.047 LCD 3D PRINTING OF A NORMALLY CLOSED FLUIDIC TRANSISTOR VIA ADDITIVE ASSEMBLY
A. Muhaymin Chowdhury, Thaddaeus D. Stine, Kalp B. Upadhayay, Carolyn G. Catan, Adithya Kidambi, Althea Marielle G. Eclarin, Catherine W. Lim, Michelle Liu, and Ryan D. Sochol
University of Maryland, USA

T3P.048 OOCYTE BIOMECHANICS USING A MICRODEVICE TO CORRELATE TRANSIENTS OF MICRO-FLOW IMPEDANCE AND ELECTRICAL IMPEDANCE
Osama Alalul[1], Jintian Liu[1], Markus Böl[1], Ala'aldeen Al-Halhouli[2], and Andreas Dietzel[1]
[1]Technische Universität Braunschweig, GERMANY and [2]German Jordanian University, JORDAN

T3P.049 STUDY OF RECTANGULAR MEMBRANE PMUT-BASED ACOUSTIC STREAMING MICROPUMP
Chen Wu[1,2], Grim Keulemans[2], Benjamin Jones[2], Veronique Rochus[2], Xavier Rottenberg[2], and Paul Heremans[1,2]
[1]KU Leuven, BELGIUM and [2]imec, BELGIUM

Wednesday - Microfluidics Platform Technologies

W4P.041 A FLOW FOCUSING MICROFLUIDIC DEVICE FOR PREPOLYMER DROPLET GENERATION AND IN-SITU UV POLYMERIZATION: STEPS TOWARDS FABRICATING IMPRINTED POLYMER MICROPARTICLES
Md Aryan Kabir, Ehsan Tabesh, and Pouya Rezai
York University, CANADA

W4P.042 ANALYSIS OF PIEZOELECTRIC TRANSDUCERS FOR GENERATING ACOUSTIC FIELDS IN ULTRASONIC CELL MANIPULATION
Barbara Leikam, Shilpi Pandey, Oliver Hayden, and Gabriele Schrag
Technical University of Munich, GERMANY

W4P.043 DROPLET FLOW SENSOR TO ACQUIRE TRANSIENT TEMPERATURE DISTRIBUTION, DROPLET POSITION, AND VELOCITY IN MICROCHANNEL
Masashi Kobayashi, Kohei Yamanaka, Daiki Tanaka, Risa Fujita, Shuichi Shoji, and Masahiro Furuya
Waseda University, JAPAN

W4P.044 EVALUATION OF SIZE AND SHAPE OF CELL SPHEROIDS FORMED BY USING VIBRATION-INDUCED FLOW TOWARD HIGH-THROUGHPUT AND HIGH REPRODUCIBLE SPHEROID FORMATION
Toshihiro Tanihata, Ryutaro Toyoshima, and Takeshi Hayakawa
Chuo University, JAPAN

W4P.045 HANDHELD VIBRATIONAL DROPLET GENERATOR: A SIMPLE, SCALABLE DEVICE FOR DIGITALIZING ASSAYS
Xiaochen Lai, Yong Zhu, Dingxiong Chen, Xicheng Wang, Haitao Lu, Ziang Chen, and Yanfei Sun
Nanjing University of Information Science & Technology, CHINA

W4P.046 INTEGRATED MICROFLUIDIC TISSUE BARRIER SENSOR MODULE FOR A STANDARDIZED AND MODULAR ORGAN-ON-CHIP PLATFORM
Jia-Jun Yeh[1,2], Pratik V. Tawade[2], Hande Aydogmus[2], Aniruddha Paul[3], Germaine Aalderink[4], Hans Bouwmeester[4], Mathieu Odijk[3], Jaap M.J. den Toonder[1], and Massimo Mastrangeli[2]
[1]Eindhoven University of Technology, NETHERLANDS, [2]Delft University of Technology, NETHERLANDS, [3]University of Twente, NETHERLANDS, and [4]Wageningen University & Research, NETHERLANDS

W4P.047 LIPID NANOPARTICLE SYNTHESIS WITH IN-SITU SIZE DETERMINATION IN A MICROFLOW ENVIRONMENT ENABLED BY 2PP
Ebrahim Taiedinejad[1,2], Cornelius Bausch[3], Jörn Wittek[3], Michael Baßler[3], and Andreas Dietzel[1,2]
[1]Technische Universität Braunschweig, GERMANY, 2Universität Braunschweig, GERMANY, and [3]Fraunhofer-Institut für Mikrotechnik und Mikrosysteme IMM, GERMANY

W4P.048 REACTIVE OXYGEN SPECIES GENERATION IN MICROFLUIDICS DEVICE BY PLASMA EXCITATION VIA THIN FILM
Rentaro Yamamoto and Shinya Kumagai
Meijo University, JAPAN

W4P.049 SYNTHESIS AND CRYSTALLIZATION OF METAL COMPLEXES CONTAINING PROTEINS IN MICROFLUIDIC DEVICES DEDICATED FOR BOTH LIQUID AND SOLID
Daiki Tanaka[1], Masashi Kobayashi[1], Risa Fujita[1], Tetsushi Sekiguchi[1], Takashiro Akitsu[2], Shuichi Shoji[1], Takashi Tanii[1], and Masahiro Furuya[1]
[1]Waseda University, JAPAN, and [2]Tokyo University of Science, JAPAN

Monday - Nanoscale Materials and Fabrication

M3P.050 A NOVEL METHOD OF SYNTHESIZING REDUCED GRAPHENE OXIDE FROM PAPER USING GAS PLASMA JET
Pn Sidhartha and Karumbaiah N. Chappanda
Southern Illinois University, Carbondale, USA

M3P.051 PERFORMANCE ENHANCEMENT OF AN INFRARED SOURCE THROUGH DEPOSITION OF CANDLE SOOT WITH A SIMPLE METHOD
Qirui Zhang, Huabin Yang, Meng Shi, Hanhui Li, Na Zhou, and Haiyang Mao
Chinese Academy of Sciences, CHINA

Tuesday - Nanoscale Materials and Fabrication

T3P.050 ECO-FRIENDLY AND LARGE-SCALE FABRICATION OF SILK-BASED ENZYMATIC BIOSENSORS THROUGH MICROELECTRONIC DEVICES
Pablo Rodríguez[1], Carla Blanes[1], Silvia Mena[1], Sebastián Gavira[1], Salvador Aznar-cervantes[2], Carlos Domínguez[1], Gonzalo Guirado[3], Sara Santiago[4], and Xavier Muñoz[1]
[1]Microelectronics Institute of Barcelona, SPAIN,
[2]Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario, SPAIN,
[3]Autonomous University of Barcelona, SPAIN, and [4]Complutense University of Madrid, SPAIN

T3P.051 SUB-100NM SUSPENDED SILICON NANOWIRE FABRICATION WITH REDUCED THERMAL BUDGET
Basit Ali, Umut Kerimzade, and B. Erdem Alaca
Koç University, TURKEY

Wednesday - Nanoscale Materials and Fabrication

W4P.050 HIGHLY PREFERRED ORIENTED TERNARY RELAXOR PB(MN,NB) O3-PB(ZR,TI)O3 THIN FILMS ON SI SUBSRATE
Jiaqian Yang, Jixuan Zhang, Tao Liu, Hanjie Dou, Wangyang Zhang, Wanyu Xu, and Xiaojing Mu
Chongqing University, CHINA

W4P.051 WRINKLE-ASSISTED NANOCHANNEL ARRAYS FOR DIFFERENTIAL RESISTIVE PULSE SENSING
Minsu Kwon, Dongwoo Seo, Sangjin Seo, and Hwisu Jeon
Ulsan National Institute of Science and Technology, KOREA

Monday - Optical and Atomic Transducers

M3P.052 2D PATTERN PROJECTION FOR MODE COUPLING ANALYSIS IN GIMBAL-LESS PIEZO-ACTUATED RESONANT SCANNING MICROMIRRORS
Adrien Piot[1], Sara R.P. Guerreiro[1,2], Rodrigo T. Rocha[1], Clement Fleury[1], Takashi Sasaki[1], Anton Lagosh[1], Ale_ Travnik[1], Dominik Holzmann[1], and Markus Bainschab[1]
[1]Silicon Austria Labs, AUSTRIA, [2]University of Tokyo, JAPAN

M3P.053 ANGLE TUNABLE KIRIGAMI-HINGED MIRROR ARRAY FOR AUTOSTEREOSCOPIC DISPLAY USING DOUBLE REFLECTION
Taiki Sugihara, Satoshi Ikezawa, and Eiji Iwase
Waseda University, JAPAN

M3P.054 HIGH-SENSITIVITY DETECTION FOR KIDNEY CANCER CELLS USING POLARIZATION INSENSITIVE EIT-LIKE THZ METASURFACE BIOSENSOR
Yunhao Cao[1], Mingyao Gao[1], Hongshun Sun[1], Xubo Song[2], Zhihong Feng[2], Lijun Ma[1], Liye Li[1], and Wengang Wu[1]
[1]Peking University, CHINA and
[2]National Key Laboratory of Solid-State Microwave Devices and Circuits, Hebei Semiconductor Research Institute, CHINA

M3P.055 MULTI-LAYERED CHIRAL METAMATERIALS USING STANDARD CMOS FOR POLARIZATION-DEPENDENT MID-INFRARED IMAGING
Cheng Xu[1], Ting-Yi Chen[2], Chun-Pu Tsai[2], Dongxiao Li[1], Hong Zhou[1], Wei-Chang Li[2], and Chengkuo Lee[1]
[1]National University of Singapore, SINGAPORE and [2]National Taiwan University, TAIWAN

M3P.056 SILICON PHOTONIC DISSOLVED CO2 SENSING SYSTEM FOR PERFLUOROCARBON-BASED PERITONEAL OXYGENATION
Bibek Ramdam[1], Hyun-Tae Kim[1], Behzad Kadkhodaeielyaderani [1], Yejin Moon[1], Parham Rezaei[1], Melissa J. Culligan[2], Nosayaba Enofe[2], Dawn Forste[2], Alexis Freiling[2], Karen Davalos[2], Maria Altemos[3],Joseph Friedberg[2], Hosam K Fathy[1], Jin-Oh Hahn[1], and Miao Yu[1]
[1]University of Maryland, USA, [2]Temple University, USA, and [3]Thomas Jefferson University, USA

M3P.057 SYNCHRONIZED OSCILLATION OF 2-BY-2 ELECTROSTATIC TORSIONAL MICROMIRROR ARRAY
Mikiya Oki, Masaki Shimofuri, Amit Banerjee, Jun Hirotani, and Toshiyuki Tsuchiya
Kyoto University, JAPAN

M3P.058 VERTICAL-COMB-DRIVEN TIP-TILT 32×32 MICROMIRROR ARRAY BASED ON DOUBLE-SOI AND SINGLE-CRYSTALLINE-SILICON TSV
Biyun Ling, Xiaoyue Wang, Minli Cai, Yuhu Xia, Biqing Zhou, Yuwei Han, and Yaming Wu
Chinese Academy of Sciences, CHINA

Tuesday - Optical and Atomic Transducers

T3P.052 3D TERAHERTZ DETECTION OF INTERNAL DEFECTS WITHIN POLYMER MATERIALS USING A THERMOMECHANICAL PERFORMANCE-ENHANCED BI-MATERIAL MICROCANTILEVER FPA
Zhanxuan Zhou[1], Jiahao Miao[1], Xueliang Wang[1], Xincheng Zhu[1], Cong Lin[1], Yang Zhong[1], Zhenwei Zhang[2], and Xiaomei Yu[1]
[1]Peking University, CHINA and [2]Capital Normal University, CHINA

T3P.053 DESIGN AND IMPLEMENT OF DUAL-AXIS PIEZOELECTRIC MEMS MIRROR FOR IMAGE ASPECT-RATIO SWITCHING
Wei-Kai Sung[1], Chang-I Lin[1], Po-Chun Lin[1], Mingching Wu[2], Mei-Feng Lai[1], and Weileun Fang[1]
National Tsing Hua University, TAIWAN and Coretronic MEMS Corporation, TAIWAN

T3P.054 LARGE-ANGLE SCANNING AND ENHANCED ROBUSTNESS PIEZOELECTRIC BIAXIAL MEMS MIRRORS BASED ON DOUBLE CIRCULAR-ARC DESIGN
Hao Huang[1], Lihao Wang[1,4], Yongquan Su[1], Yichen Liu[1], Yang Wang[1], and Zhenyu Wu[1,2,3,4]
[1]Chinese Academy of Sciences, CHINA, [2]Shanghai University, CHINA,
[3]Shanghai Industrial Technology Research Institute (SITRI), CHINA, and
[4]MExpert Technologies Co., Ltd, CHINA

T3P.056 SPLIT ACCELERATED DEGRADATION TEST PLATFORM WITHOUT ON-CHIP SENSOR FOR LONG-TERM RELIABILITY OF 2D MEMS MIRRORS
Ze-Yu Zhou, Kai-Ming Hu, Er-qi Tu, Heng Zou, Hui-Yue Lin, and Wen-Ming Zhang
Shanghai Jiaotong University, CHINA

T3P.057 ULTRA-HIGH RESPONSIVITY BRIDGE UNCOOLED INFRARED MICROBOLOMETERS BASED ON THIN-FILM MN-CO-NI-O
Yan Zhao, Zirui Yang, Xiaoyu Qi, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

Wednesday - Optical and Atomic Transducers

W4P.052 A REUSABLE AND HIGH-SENSITIVE TERAHERTZ METASURFACE SENSOR INTERATED ULTRA-THIN MICROFLUIDIC CHANNEL FOR DETECTION OF TRACE SOLUTION
Yunhao Cao, Hongshun Sun, Yusa Chen, Lijun Ma, Liye Li, and Wengang Wu
Peking University, CHINA

W4P.053 ENHANCED PERFORMANCE OF FIBER-OPTIC LOCALIZED SURFACE PLASMON RESONANCE SENSOR VIA BUMPY BALL STRUCTURE BASED ON RAPID THERMAL ANNEALING
Jong-Hyun Bang, Hyeong-Min Kim, Min-Seok Choo, Jae-Hyoung Park, and Seung-Ki Lee
Dankook University, KOREA

W4P.054 MINIATURIZED BEAM SCANNING DEVICE ENABLED BY CASCADED METASURFACES FOR LIDAR APPLICATIONS
Chi Zhang[1], Lingyun Zhang[1,2], Li Zhang[1], Rongbo Xie[1], Ziqi Mei[1], Chenzi Wang[1], Yibo Ni[1], Chensong Xiong[1], Xiaoyu Wu[1], Fei Xing[1], Zheng You[1], and Xiaoguang Zhao[1]
[1]Tsinghua University, CHINA and [2]Huazhong University of Science and Technology, CHINA

W4P.055 PIEZOELECTRIC MICROMIRROR WITH INTEGRATED RESONANT SENSOR
Takashi Sasaki, Adrien Piot, Rodrigo T. Rocha, Anton Lagosh, Sara R.P. Guerreiro, Clément Fleury, Dominik Holzmann, and Aleš Travnik
Silicon Austria Labs, AUSTRIA

W4P.056 SYMMETRIC METAMATERIAL ANTENNA TO IMPROVE RESPONSIVITY OF CMOS-MEMS THERMOELECTRIC INFRARED SENSORS
Yian Su[1], Cheng-En Yang[1], Yi Chiu[2], and Weileun Fang[1]
[1]National Tsing Hua University, TAIWAN and [2]National Yang Ming Chiao Tung University, TAIWAN

W4P.057 ULTRATHIN THICKNESS DETECTION BASED ON THE WAVELENGTH- AND ANGLE-INTERROGATION OF SURFACE LATTICE RESONANCE
Liye Li, Yifan Ouyang, Hongshun Sun, Yunhao Cao, Yusa Chen, Lijun Ma, and Wengang Wu
Peking University, CHINA

Monday - Packaging & Solid-State Materials and Fabrication Processes

M3P.059 A MICRO-OVEN-CONTROLLED WAFER-LEVEL VACUUM PACKAGING PROCESS PLATFORM FOR MEMS RESONANT DEVICES
Kaixuan He[1,2], Rui Feng2, Yu Zheng[2], Lijian Guo[2], Qichao Liao[2], Yuan Xiang[2], Hongkun Zhang[2], Jiachou Wang[3], and Xinxin Li[1,3]
[1]Fudan University, CHINA, [2]East China Institute of Photo-Electron IC, CHINA, and [3]Chinese Academy of Sciences, CHINA

M3P.060 DEFLECTION CHARACTERISTICS OF A CIRCULAR SLIT DIAPHRAGM MEMS DEVICE
Tim J. Cheng[1,2], Robert D. White[1], and Kasia Oleske[2]
[1]Tufts University, USA and [2]The Charles Stark Draper Laboratory, USA

M3P.061 ELECTROHYDRODYNAMIC HIGH-PRECISION PRINTING: AN EMERGING APPROACH FOR FABRICATION OF WEARABLE MICROSENSORS
Nadine Philippin[1,2], Ingo Kuehne[1], Alexander Frey[3], and Gabriele Schrag[2]
[1]Heilbronn University of Applied Sciences, GERMANY, [2]Technical University of Munich, GERMANY and [3]Technical University of Applied Sciences, Augsburg, GERMANY

M3P.062 FABRICATON OF THROUGH-SILICON-VIA INDUCTORS FOR HIGH-FREQUENCY VERTICAL POWER DELIVERY
Yixiao Ding, Xuan Wang, Dengyang Lu, and Mark G. Allen
University of Pennsylvania, USA

M3P.063 INFLUENCE OF DIFFUSIVE PENETRATION OF SMALL MOLECULES/ATOMS INTO VACUUM CAVITY SEALED BY SILICON MIGRATION
Nobutoshi Nemoto, Yukio Suzuki, and Shuji Tanaka
Tohoku University, JAPAN

M3P.064 LOW-TEMPERATURE AU-IN TLP BONDING FOR COMPACT HERMETIC PACKAGING OF PIEZOELECTRIC MEMS DEVICES
Leman D. Balcı[1,2], Ali C. Atik[1,2], Muhammed B. Yüksel[1], and Haluk Külah[1,2]
[1]Middle East Technical University, TURKEY and [2]METU MEMS Research and Application Center, TURKEY

M3P.065 NEEDLE-TYPE OXYGEN MICROSENSOR MADE BY 3D PRINTING AND LOCALIZED 3D ELECTROLESS PLATING
Juntaro Nomaru, Taisuke Masuda, Satoshi Amaya, Kohki Tanabe, and Fumihito Arai
University of Tokyo, JAPAN

M3P.066 SIDEWALL FORCE SENSOR PACKAGING FOR MINIMALLY INVASIVE CARDIOVASCULAR TREATMENT
Chao-Wei Dong and Woo-Tae Park
Seoul National University of Science and Technology, KOREA

Tuesday - Packaging & Solid-State Materials and Fabrication Processes

T3P.058 A COST-EFFECTIVE UNIVERSAL WAFER LEVEL PACKAGING PLATFORM FOR BAW AND THIN-FILM SAW FILTERS
Ji Liang, Xiaoru Wang, Weiwei Hu, Zongmin Hong, Duan Feng, and Jie Zou
Shenzhen Newsonic Technologies Co.Ltd, CHINA

T3P.059 A NOVEL ON-WAFER METHOD FOR BEAM SPOT INTENSITY DISTRIBUTION CHARACTERIZATION IN ELECTRON BEAM LITHOGRAPHY PROCESS
Shiyang Yuan, Peng Liu, Fengjun Yu, Xuanqing Hua, Xufeng Wang, Zhiheng Yu, and Dacheng Zhang
Peking University, CHINA

T3P.060 DEVELOPMENT OF CRYSTALLIZED 14 µM THICK, HIGHLY DOPED A-SI:H LAYERS FOR SURFACE MICROMACHINING OF MEMS
Yimei Zhang[1,2], Hans-Joachim Quenzer[1], Björn Jensen[1], Jens-Hendrik Zollondz[1], and Axel Müller-Groeling[1,2]
[1]Fraunhofer Institute for Silicon Technology, GERMANY and [2]Christian-Albrechts-Universität zu Kiel, GERMANY

T3P.061 FABRICATION PROCESS FOR ULTRA-RELIABLE POLYIMIDE-BASED NEURAL-INTERFACE TECHNOLOGY
Kenneth A. Fluker, Jr. and Jack W. Judy
University of Florida, USA

T3P.062 GLOBAL OPTIMIZATION OF THIN-FILM PROPERTIES IN PECVD SYSTEM HARNESSED BY COMPLEX-SYSTEM-RESPONSE (CSR) PLATFORM
Wen-Jun Chen[1,2], Shih-Chin Lin[2], Ching-Chiun Wang[2], Chih-Ming Ho[1], and Da-Jeng Yao[1,2]
[1]National Tsing Hua University, TAIWAN and [2]Industrial Technology Research Institute, TAIWAN

T3P.063 INFRA-RED CONCAVE LENS MOLD WITH MOTH EYE MICROSTRUCTURE REALIZED BY SUPER-CONTACT PATTERNING OF LATENT IMAGE
Taku Sakai and Minoru Sasaki
Toyota Technological Institute, JAPAN

T3P.064 MEMS INERTIAL SENSORS FOR EXTREME ENVIRONMENTS
David Lin, Robert MacDonald, Emad Andarawis, and David Shaddock
GE Aerospace Research, USA

T3P.065 NON-SOI (111) WAFER SINGLE-SIDE MICROFABRICATION OF SILICON-BASED RESONANT STRUCTURE INSIDE VACUUM CHAMBER FOR TINY-SIZE, HIGH-PERFORMANCE AND LOW-COST RESONANT DIFFERENTIAL PRESSURE SENSORS
Yubo Tian, Jiachou Wang, and Xinxin Li
Chinese Academy of Sciences, CHINA

T3P.066 WAFER-LEVEL FABRICATION OF ON-CHIP SINGLE/DOUBLE LAYER RECTANGULAR SPIRAL INDUCTORS FOR IMPLANTABLE BIOSENSORS
Pichao Pan, Li Wang, Jiebin Gu, and Xinxin Li
Chinese Academy of Sciences, CHINA

Wednesday - Packaging & Solid-State Materials and Fabrication Processes

W4P.058 A LOW-COST BATCH FABRICATION METHOD FOR ESTABLISHING ELECTRICAL CONNECTIONS IN THROUGH-SILICON VIAS FOR CHIP INTEGRATION ENABLING IN SITU PRESSURE MONITORING
Sanjana Afrin Raisa, Khandaker Reaz Mahmud, Steven Tran, Farhan Sadik Sium, Seungbeom Noh, and Hanseup Kim
University of Utah, USA

W4P.059 A PSPI/PSEP/PSPI NANOCOMPOSITE POLYMER INTERPOSER TECHNOLOGY FOR WIRELESS EDGE-AI MCIROSYSTEM INTEGRATION
Yu-Chia Chang[1], Pin-Cheng Tseng[1], Ting-Yu You[1], Yu-Ting Cheng[1], Chien-Nan Kuo[1], Der-Hsien Lien[1], and Yu-Tao Yang[3]
[1]National Yang MIng Chiao Tung University, TAIWAN, [2]National Taiwan University, TAIWAN, and [3]Mediatek Company, TAIWAN

W4P.060 ELECTRODE DEPENDENT THERMAL STABILITY OF PZT THIN FILM FOR POST-PIEZOELECTRIC PROCESS
Chong Yang, Aocheng Bao, Ping Yin, Jin You, Bowen Sheng, and Yipeng Lu
Peking University, CHINA

W4P.061 EXPLORING ENERGY LOSS MECHANISM OF ZERO-THERMAL-EXPANSION AND OTHER GLASSES AS MATERIALS OF MEMS RESONATORS
Kouta Koshiro, Shuji Tanaka, and Takashiro Tsukamoto
Tohoku University, JAPAN

W4P.062 HIGH DENSITY DIRECT AU-AU INTERCONNECTS USING THERMAL COMPRESSION BONDING FOR HETEROGENEOUS INTEGRATION
Nishant Kumar Sharma, Ankit Priya, and Prosenjit Sen
Indian Institute of Science, INDIA

W4P.063 LASER-ASSISTED MEMS WAFER-LEVEL VACUUM PACKAGING USING ULTRATHIN TI LAYER FOLLOWING IN-AIR OPTICAL ALIGNMENT
Shumpei Ii[1], Yoshinori Ikagawa[1], Hiroshi Yamabe[1], Yukio Suzuki[2], and Shuji Tanaka[2]
[1]TAZUMO, Co, Ltd., JAPAN and [2]Tohoku University, JAPAN

W4P.064 MINIATURIZED, RF-BASED, AND BATTERY-FREE STIMULATORS PACKAGED WITH POLYMER-METAL FLEX CIRCUITS FOR IMPLANT APPLICATIONS
Kenneth A. Fluker, Jr., Sultan Mahmud, Han Wu, Ladan Jiracek-Sapieha, Adam Khalifa, and Jack W. Judy
University of Florida, USA

W4P.065 PT-PT BONDING FOR HIGH-TEMPERATURE INTEGRATED RESONANT PRESSURE SENSORS
Tanya Chauhan, Seyyed Mojtaba Hassani Gangaraj, and Azadeh Ansari
Georgia Institute of Technology, USA

Monday - Physical Sensors and Microsystems

M3P.067 A BATTERYLESS UV DOSE SENSOR FOR INTELLIGENT FOOD PACKAGING ENABLED BY LASER-INDUCED GRAPHENE AND SUSTANABLE MATERIALS
Mohammadreza Chimehrad, Pouya Borjian, and Hyoung Jin Cho
University of Central Florida, USA

M3P.068 A FORCE SENSOR FOR MULTI-PHYSICS DETECTIONS AND THEIR DECOUPLING IN PRACTICAL FIELD APPLICATIONS
Chieh-Cheng Wang and Cheng-Yao Lo
National Tsing Hua University, TAIWAN

M3P.069 A HIGH-SENSITIVITY TEMPERATURE/STRAIN SENSOR BASED ON A SINGLE-PORT SAW RESONATOR FEATURING ON-CHIP COMPENSATION CAPABILITY
Chunlong Cheng, Yanxin Liu, Jingwen Yang, Xiaoru Li, Tong Tong, Huahuang Luo, Zihan Lu, Zhiqing Zhang, Tingfeng Peng, and Qingqing Ke
Sun Yat-sen University, CHINA

M3P.070 A NOVEL FLEXIBLE VITAL SIGNS AND SLEEP MONITORING BELT BASED ON A MEMS IMU AND PRESSURE SENSORS FOR EICU AIRBED APPLICATION
Chunhua He[1], Jian Zhan[1], Xin Fang[1], Heng Wu[1], Songqing Deng[2], Zhengfei Yang[2], and Maojin Liang[2]
[1]Guangdong University of Technology, CHINA and [2]Sun Yat-Sen University, CHINA

M3P.071 A REAL-TIME TILT SENSOR BASED ON A PIEZOELECTRIC MEMS RESONANT ACCELEROMETER THROUGH DEMODULATED AMPLITUDE DETECTION
Sanket Shivaji Suryawanshi, Jyoti Satija, Hsuan-Cheng Lin, Chin-Yu Chang, Anurag A. Zope, and Sheng Shian Li
National Tsing Hua University, TAIWAN

M3P.072 A SILICON RESONANT PRESSURE SENSOR WITH 180 MPA CAPABILITY FOR EXTREME ENVIRONMENTS
Pengxiang Ye, Zongze Yu, Deyong Chen, Junbo Wang, Bo Xie, Yulan Lu, and Nan Li
Chinese Academy of Sciences, CHINA

M3P.073 ADVANCED THREE-DIMENSIONAL ACOUSTIC VECTOR SENSOR SYSTEM: PHYSICALLY-INFORMED MACHINE LEARNING-DRIVEN FREQUENCY RESPONSE FLATTENING AND MULTI-AXIS CORRELATION NOISE OPTIMIZATION
Lihao Ma, Xu Ma, Beining Wang, Wangnan Chen, Nan Zhang, Xiaoyu Qi, Yan Zhao, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

M3P.074 DUAL-MODE ELECTRIC POWER SENSING BASED ON MEMS RESONATORS
Xuecui Zou[1], Nizar Jaber[3], Yuan Liu[1], Dongxiang Luo[4], Hossein Fariborzi[2], and Khaled Salama[2]
[1]Guangdong University of Technology, CHINA,
[2]King Abdullah University of Science and Technology, SAUDI ARABIA,
[3]Aramco, SAUDI ARABIA, and [4]Guangdong University, CHINA

M3P.075 FABRICATION OF WAFER-LEVEL VACUUM PACKAGED POLY-SI/SIC BEAM RESONATORS WITH STRAIN SENSITIVITY LARGER THAN 1 KHZ/μ_
Sergio Sapienza[1], Luca Belsito[1], Matteo Ferri[1], Ivan Elmi[1], Marcin Zielinski[2], and Alberto Roncaglia[1]
[1]National Research Council, ITALY, and [2]Soitec, FRANCE

M3P.0756 FREQUENCY-CODED FLEXIBLE MICROFLUIDIC RFID SENSOR FOR SIMULTANEOUS TEMPERATURE AND DEFORMATION MEASUREMENT
Sheikh Dobir Hossain, Samuel A. Jiron, and Robert C. Roberts
University of Texas, El Paso, USA

M3P.077 HIGH-Q DIAMAGNETICALLY LEVITATED MECHANICAL RESONATORS WITH TIME-DOMAIN RING-DOWN MEASUREMENTS
Samira Yasmin[1], Pooja Roy[1], Yunong Wang[2], Philip Feng[2], and Jaesung Lee[1]
[1]University of Central Florida, USA and [2]University of Florida, USA

M3P.078 MACHINE LEARNING-ASSISTED NONLINEARITY DECOUPLING FOR MEMS RESONATORS WITHIN CLOSED-LOOP CONFIGURATION
Chengxin Li[1], Fan Wu[1], Mustafa Mert Torunbalci[2], Hemin Zhang[3], Ruochen Ding[1], Milad Shojaeian[1], Helin Li[1], Chen Wang[1], Lieven D.E. Strycker[1], and Michael Kraft[1]
[1]KU Leuven, BELGIUM, [2]Google, USA, and [3]Northwestern Polytechnical University, CHINA

M3P.079 MONOLITHIC CMOS-MEMS TACTILE FORCE/PROXIMITY SENSORS WITH FULL WHEATSTONE BRIDGE AND SHIELDING ELECTRODE
Pei Yun Li, Ruei-Cing Mai, Yi-Ming Lai, Meifeng Lai, and Weileun Fang
National Tsing Hua University, TAIWAN

M3P.080 NEUROMORPHIC ACOUSTIC SENSORS USING PIEZOELECTRIC MEMS RESONATORS WITH EPITAXIALLY GROWN BIFEO3 FILMS
Sena Yamamoto[1], Mario Kiuch[1], Sengsavang Aphayvong[2], Meika Takagi[2], Yohane Fujibayashi[2], and Takeshi Yoshimura[2]
[1]Sumitomo Precision Products Co., LTD., JAPAN and [2]Osaka Metropolitan University, JAPAN

M3P.081 NOVEL TACTILE-TEXTURE SENSING SYSTEM WITH SUPER-HUMAN SENSING PERFORMANCE VIA DEEP LEARNING
Shuta Kanda1, Yusaku Maeda[1,2], Kyohei Terao[1], Mayu Ikeda[1], Kazuhiro Kubo[1], and Hidekuni Takao[1]
[1]Kagawa University, JAPAN and [2]National Institute of Technology, Kagawa College, JAPAN

M3P.082 PLANAR SINGLE-LAYER LITHIUM NIOBATE PIEZOELECTRIC TRANSDUCER WITH NO PASSIVE LAYER
Vakhtang Chulukhadze, Ziqian Yao, Naveed Ahmed, Zihuan Liu, Xiaoyu Niu, Tzu-Hsuan Hsu, Neal Hall, and Ruochen Lu
University of Texas, Austin, USA

M3P.083 SIMULTANEOUS ACQUISITION OF VISCOUS AND ELASTIC PROPARTIES BY SINGLE MEASUREMENT SCAN OF FINGERTIP-TYPE TACTILE SENSOR
Aoi Itou, Adila Azhar, Kyohei Terao, and Hidekuni Takao
Kagawa University, JAPAN

M3P.084 THERMALLY INSENSITIVE PRESSURE SENSOR WITH HIGH SENSITIVITY AND BROAD DETECTION RANGE FOR STATUS MONITORING OF BATTERY MODULE
Donghyun Lee[1], Seongbeom Heo[1], Gyeongwan Lee[1], Janghyeon Lee[2], Dong Gu Kim[2], Deok Woo Yun[2], Yoonhyuk Kang[2], and Jungwook Choi[1]
[1]Chung-Ang University, KOREA and [2]Hyundai Motor Company, KOREA

M3P.085 TOWARDS ENCODER-LIKE TACTILE SENSING VIA CONDUCTIVE BEAM BUCKLING
Lilly Rizvi, Ibrahim Abubakar, and Kris Dorsey
Northeastern University, USA

M3P.086 ULTRA-HIGH FREQUENCY AND SMALL APERTURE SIZE CIRCULAR ARRAY BASED ON PIEZOELECTRIC POLYMER FOR INTRAVASCULAR ULTRASOUND IMAGING
Zhiqing Zhang, Guoxiang Zhang, Weiting Liu, Kanjie Du, Zihan Lu, Chunlong Cheng, Jingwen Yang, Tingfeng Peng, Huahuang Luo, and Qingqing Ke
Sun Yat-sen University, CHINA

M3P.087 ACCURATE ACQUISITION OF PRESSURE SIGNALS WITH OPTIMAL AMPLITUDE USING FLEXIBLE TACTILE SENSOR ARRAY
Tengteng Lei, Boyi Zhu, Yushen Hu, and Man Wong
Hong Kong University of Science and Technology, HONG KONG

Tuesday - Physical Sensors and Microsystems

T3P.067 A COMPACT THREE-DIMENSIONAL ACOUSTIC VECTOR SENSOR WITH STEPPED DOUBLE SEMI-CONE TUBE HORN
Lihao Ma, Xu Ma, Beining Wang, Wangnan Chen, Nan Zhang, Xiaoyu Qi, Yan Zhao, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

T3P.068 A HIGH-FLATNESS PMUT-BASED HYDROPHONE SYSTEM FOR LARGE BANDWIDTH UNDERWATER ACOUSTIC DETECTION
Hanshuo Liu, Tao Ruan, Zhiyong Hu, Lixuan Li, Zhiyue Yang, Fangtao Kuang, and Jingquan Liu
Shanghai Jiao Tong University, CHINA

T3P.069 A LOW FREQUENCY MEMS THERMAL VECTOR HYDROPHONE WITH ACOUSTIC VELOCITY HORN
Xu Ma, Lihao Ma, Wangnan Chen, Beining Wang, Xiaoyu Qi, Nan Zhang, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

T3P.070 A NOVEL HIGH-SENSITIVITY RESONANT ELECTRIC FIELD MICROSENSOR WITH NONLINEAR ENHANCED SENSITIVITY
Junpeng Wang, Iacheng Li, Wenjie Liu, Jiahao Luo, Zhengwei Wu, and Chunrong Peng
Chinese Academy of Sciences, CHINA

T3P.071 A PRACTICAL RESONANT MEMS THERMOMETER FOR CRYOGENIC TEMPERATURE APPLICATIONS
Yueyang Li[1], Benhao Huo[1], Yuan Wang[1], Pui-In Mak[1], Michael Kraft[2], Yatao Peng[1], Wang Chen[2], and Pan Zhang[3]
[1]University of Macau, MACAO, [2]KU Leuven, BELGIUM, and [3]Peking University, CHINA

T3P.072 A STABILIZED-FLOW PACKAGING METHOD FOR ENHANCED INTERFERENCE RESISTANCE IN ELECTROCHEMICAL VELOCITY-TYPE VECTOR HYDROPHONES
Nan Zhang, Xiaoyu Qi, Lihao Ma, Yan Zhao, Xu Ma, Zhenchuan Yang, and Chengchen Gao
Peking University, CHINA

T3P.073 ATO THIN-FILM STRAIN GAUGE: A BREAKTHROUGH IN ULTRA-HIGH-TEMPERATURE SENSING
Nan Zhao[1], Yusen Wang[2], Congchun Zhang[1], and Guifu Ding[1]
[1]Shanghai Jiao Tong University, CHINA and
[2]Shanghai Aerospace Electronic Technology Institute, CHINA

T3P.074 DEMONSTRATION OF >30K-CYCLE STABILITY OF A PRINTED-CIRCUIT-BOARD-BASED NETWORK TACTILE SENSOR WITH EMBEDDED SENSOR PLATFORM LSI
Jorge E. Lopez, Masanori Muroyama, Takashiro Tsukamoto, and Shuji Tanaka
Tohoku University, JAPAN

T3P.075 DEVELOPMENT OF A VACUUM SUCTION MICROCUP ARRAY FEATURING VISIONBASED TACTILE SENSING FOR ROBOTIC MANIPULATION - CHARACTERIZATION OF A TRI-AXIAL FORCE DISTRIBUTION SENSOR -
Yuma Kanazawa[1], Yukiya Matsumura[1], Kazuki Yokohata[1], Sho Ohira[1], Toshihiro Shiratori[2], Masato Suzuki[1], Tomokazu Takahashi[1], and Seiji Aoyagi[1]
[1]Kansai University, JAPAN and [2]Keio University, JAPAN

T3P.076 FIRST DEMONSTRATION OF SILICON CARBIDE MICROPHONE
Siti Aisyah Zawawi[1], Azrul Azlan Hamzah[2], Burhanuddin Yeop Majlis[2], and Faisal Mohd-Yasin[3]
[1]Universiti Teknologi MARA, MALAYSIA, [2]Universiti Kebangsaan Malaysia, MALAYSIA, and [3]Griffith University, AUSTRALIA

T3P.077 HIGH-INTER-AXIAL-ORTHOGONALITY TRIAXIAL GYROSCOPE WITH BUILDING-BLOCK SENSORS AND COMPENSATION ALGORITHM
Ippei Takahashi[1], Hirofumi Funabashi[1], Shota Harada[2], and Teruhisa Akashi[1]
[1]Toyota Central R&D Labs., INC., JAPAN and [2]MIRISE Technologies Corporation, JAPAN

T3P.078 INNOVATIVE APPROACH TO CONTACT POSITION AND AREA ESTIMATION VIA RESPONSE MAPPING OF TACTILE SENSOR WITH MICROCANTILEVERS EMBEDDED IN ELASTOMER
Ryusuke Mitobe, Harufumi Hosokawa, Takashi Abe, and Masayuki Sohgawa
Niigata University, JAPAN

T3P.079 MAGNETORESISTIVE SENSORS FOR MICROROBOTICS USING AMORPHOUS OXIDE SEMICONDUCTORS
Pin-Chun Huang, Guoduan Liu, Rohit Amba, Juan Sanchez, and Camilo Velez Cuervo
University of California, Irvine, USA

T3P.080 MULTI-AXIS LARGE-RANGE SILICON MICROMACHINED FORCE SENSING SYSTEM
Lars Holm, Remco J. Wiegerink, and Dennis Alveringh
University of Twente, NETHERLANDS

T3P.081 NONLINEAR MEMS RESONATOR BASED PROGRAMMABLE PRESSURE SWITCH
Xuecui Zou[1], Nizar Jaber[3], Yuan Liu[1], Dongxiang Luo[4], Hossein Fariborzi[2], and Khaled Salama[2]
[1]Guangdong University of Technology, CHINA,
[2]King Abdullah University of Science and Technology, SAUDI ARABIA,
[3]Aramco, SAUDI ARABIA, and [4]Guangdong University, CHINA

T3P.082 NUCLEAR MAGNETIC RESONANCE FORCE DETECTION USING A MICRO-GLASS-TUBE RESONATOR
Ryosuke Shibaki, Zilong Zhang, Takahito Ono, and Masaya Toda
Tohoku University, JAPAN

T3P.083 REDUCING DRIFTS OF MEMS PIEZORESISTIVE GYROSCOPES IN UNCONTROLLED ENVIRONMENT
Gabriele Laita[1], Francesco Tubaro[1], Andrea Buffoli[2], Philippe Robert[2], and Giacomo Langfelder[1]
[1]Politecnico di Milano, ITALY and [2]CEA-Leti, FRANCE

T3P.084 STUDY ON THERMALLY TUNED ASYMMETRICAL COUPLED RESONATOR AND ITS GAS SENSING APPLICATION
Zhengliang Fang[1,4], Bernardo P. Madeira[2], Chen Wang[2], Yuan Wang[3], Chun Zhao[4], Stephanos Theodossiades[1], and Amal Z. Hajjaj[1]
[1]Loughborough University, UK, [2]University of Leuven, BELGIUM, [3]University of Macau, CHINA, and [4]York University, UK

T3P.085 THREE-DEGREE-OF-FREEDOM MODE LOCALIZED SENSING WITHIN A SINGLE MEMS RESONATOR ENABLED BY TWO PARAMETRIC MODULATION SIGNALS
Erion Uka[1], Jingqian Xi[1,2], and Chun Zhao[1]
[1]University of York, UK and [2]Huazhong University of Science and Technology, CHINA

T3P.086 TUNABLE FABRICATION OF FLEXIBLE RESISTIVE PRESSURE SENSORS VIA VAPOR-INDUCED PHASE SEPARATION FOR HIGH SENSITIVITY AND WIDE LINEAR DETECTION RANGE
Seongbeom Heo, Donghyun Lee, Seokmin Kim, and Jungwook Choi
Chung-Ang University, KOREA

T3P.087 ULTRA-HIGH SENSITIVE IONOTRONIC PRESSURE SENSOR BASED ON ZIF-67 DECORATED PVDF-HFP@IL NANOFIBERS FOR LIP MOTION DETECTION
Sagar Sapkota, Gagan Bahadur Pradhan, Shital Sharma, and Jae Yeong Park
Kwangwoon University, KOREA

Wednesday - Physical Sensors and Microsystems

W4P.066 2D CALORIMETRIC THERMAL FLOWMETER WITH INTEGRATED THERMAL CONDUCTIVITY SENSOR
Jarno Groenesteijn[1], Victor Winnen[1,2], and Wouter Sparreboom[1]
[1]Bronkhorst High-Tech B.V., NETHERLANDS and [2]University of Twente, NETHERLANDS

W4P.067 A DUAL MOTOR TEETER-TOTTER INERTIAL SENSOR WITH HIGH SNR AND WIDE BANDWITH FOR BONE-CONDUCTED VOICE DETECTION
Shubham Shubham, Mohammad F. Zaman, Evan Llamas-Young, Michael L. Kuntzman, Jing Ouyang, and Michael Pedersen
Syntiant Corporation, USA

W4P.068 A HIGH-SENSITIVITY ELECTROCHEMICAL VIBRATION SENSOR WITH FAST RESPONSE AND HIGH OVERLOAD RESISTANCE CAPABILITY
Xiaoyu Qi, Nan Zhang, Yan Zhao, Wangnan Chen, Beining Wang, Chengchen Gao, and Zhenchuan Yang
Peking University, CHINA

W4P.069 A MEMS ACCELEROMETER WITH IN-SENSOR NEUROMORPHIC COMPUTING CAPABILITY
Yunlong Bai[1,2], Wuhao Yang[1], Bingchen Zhu[1,2], Zheng Wang[2], and Xudong Zou[1,2]
[1]Chinese Academy of Sciences, CHINA and [2]QiLu Aerospace Information Research Institute, CHINA

W4P.070 A RESONANT MEMS ELECTRIC FIELD SENSOR BASED ON FEEDBACK CAPACITOR CLOSED-LOOP AND NEURAL NETWORK METHOD FOR TEMPERATURE COMPENSATION
Jiacheng Li, Junpeng Wang, Jiahao Luo, Wenjie Liu, Zhengwei Wu, Ren Ren, and Chunrong Peng
Chinese Academy of Sciences, CHINA

W4P.071 A RESONANT PRESSURE SENSOR BASED ON WEDGE-SHAPED COMB EXITATIONS
Wei Jiang, Yulan Lu, Bo Xie, Deyong Chen, Junbo Wang, Jian Chen, and Nan Li DETECTION OF SMALL EXTRACELLULAR VESICLE SUBPOPULATIONS USING A SILICON NANOWIRE FIELD-EFFECT TRANSISTOR BIOSENSOR
Chinese Academy of Sciences, CHINA

W4P.072 A STUDY ON THE PHOTOELECTRIC EFFECT OF A MEMS RESONATOR AT CRYOGENIC TEMPERATURE
Yueyang Li[1], Yancheng Lian[1], Yuan Wang[1], Pui-In Mak[1], Chen Wang[2], Pan Zhang[3], and Yatao Peng[1]
[1]University of Macau, MACAO, [2]KU Leuven, BELGIUM, and [3]Peking University, CHINA

W4P.073 CHARACTERIZATION AND MODELING METHOD OF ELECTRICAL AND MECHANICAL COUPLINGS FOR A MEMS CAPACITIVE GYROSCOPE
Chunhua He[1], Yingyu Xu[1], Jing Lin[1], Qinwen Huang[2], Qiancheng Zhao[3], Guizhen Yan[3], Yanchao Ren[4], and Guodong Duan[4]
[1]Guangdong University of Technology, CHINA, [2]Ministry of Industry and Information Technology, CHINA, [3]Peking University, CHINA, and [4]Hunan VanGuard Group Co.Ltd, CHINA

W4P.074 DESIGN AND IMPLEMENTATION OF PZT PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS FOR DISTANCE SENSING
Cheng-Yang Chang[1], Sheng-Hsiang Tseng[1], Yi-Jen Wang[1], Chin-Te Hsin[1], You Qian[2], Sagnik Ghosh[2], Yao Zhu[2], Ying-Zong Juang[1], and Tuo-Hung Hou[1]
[1]Taiwan Semiconductor Research Institute, TAIWAN and [2]Institute of Microelectronics, SINGAPORE

W4P.075 EXTRACTION OF THERMAL PACKAGING STRESS VIA INTRINSIC SILICON ON GLASS STRESS MEASUREMENT
Ahmet Arif Aslan[1] and Erdinc Tatar[1,2]
[1]Bilkent University, TURKEY and [2]National Nanotechnology Research Center (UNAM), TURKEY

W4P.0756 FREQUENCY DYNAMICS OF MICRO-PERFORATED THERMAL SENSORS: UNLOCKING POTENTIAL IN ACOUSTIC SENSING
Akash Gupta[1], Achim Bittner[1], and Ing Alfons Dehé[1,2]
[1]Hahn-Schickard-Gesellschaft für angewandte Forschung, GERMANY, and [2]University of Freiburg, GERMANY

W4P.077 HIGH-PERFORMANCE OSCILLATION TRACKING AND FREQUENCY READOUT SYSTEM FOR ALL-QUARTZ MONOLITHIC MEMS RESONANT ACCELEROMETERS ENABLES ULTRA-HIGH STABILITY
Kai Bu[1,2], Cun Li[1,2], Yulong Zhao[1,2], Hong Xue[1,2], Jiabin Ai[1,2], Shengxiang Zhou[1,2], and Zichao Zhang[1,2]
[1]Xi'an Jiaotong University, CHINA and
[2]State Key Laboratory for Manufacturing Systems Engineering, CHINA

W4P.078 INTEGRATED DIAMOND MAGNETOMETER FOR VECTOR MAGNETIC MEASUREMENT
Xiao Peng[1], Fei Xie[1], Yaochen Zhu[1], Xin Luo[2,3], Qihui Liu[1], Yuqiang Hu[2,3], Jiachen Han[2,3], Lingyun Li[1], Hao Chen[1], Jiangong Cheng[1], and Zhenyu Wu[1,2,3]
[1]Chinese Academy of Sciences, CHINA, [2]Shanghai University, CHINA, and
[3]Shanghai Industrial Technology Research Institute (SITRI), CHINA

W4P.079 MEMS MICROPHONE-DRIVEN NEAR-SENSOR RESERVOIR COMPUTING FOR LIGHTWEIGHT TOOL WEAR CLASSIFICATION IN MILLING
Shang-Yu Lin, Po-Han Chen, Ting-Yi Chen, Pei-Zen Chang, and Wei-Chang Li
National Taiwan University, TAIWAN

W4P.080 NEAR ZERO-POWER OMNIDIRECTIONAL, IN-PLANE PULL-IN-BASED MEMS SWITCH
Inês S. Garcia[1], Filipa C. Mota[1], Jorge M. Pereira[1], Fahimullah Khan[1], Carlos Ferreira[2], Jorge Cabral[2], José Fernandes[1], Rosana A. Dias[1], and Filipe S. Alves[1]
[1]INL - International Iberian Nanotechnology Laboratory, PORTUGAL and [2]Ceiia, PORTUGAL

W4P.081 NOVEL DIAMOND NANOWIRE FIELD EMISSION TRIODES AND THEIR APPLICATION AS BUFFER AMPLIFIERS AND VACUUM SWITCHES
Yang Wang, Rui Tang and Jinwen Zhang
Peking University, CHINA

W4P.082 PARAMETRICALLY ACTUATED RESONANT ELECTRIC FIELD MICROSENSOR IN THE DUFFING REGIME
Guijie Wang[1], Shenglin Hou[2], Lifang Ran[1], Jianhua Li[1], Bo Zhang[1], Xiaolong Wen[1,2], Najib Kacem[3], and Ashwin A. Seshia[2]
[1]University of Science and Technology, Beijing, CHINA, [2]University of Cambridge, UK, and [3]University of Franche-Comté, Besançon, FRANCE

W4P.083 SAMPLING-MOIRé-METHOD FORCE PLATE ARRAY VIA SINGLE-STEP 3D-PRINTING
Ohga Nomura, Yukitake Nakahara, Ami Ogawa, and Hidetoshi Takahashi
Keio University, JAPAN

W4P.084 SURFACE-MICROMACHINED CMOS-MEMS CAPACITIVE PRESSURE SENSOR WITH ENHANCED SENSITIVITY FOR LOW-PRESSURE APPLICATIONS
Feiyun Wang, Xuan Ouyang, and Wei Xu
Shenzhen University, CHINA

W4P.085 TOWARD ZERO-POWER FEATURE EXTRACTION FOR SPEECH WAKEUP USING HELMHOLTZ RESONATOR ARRAY
Po-Han Chen[1], Ting-Yi Chen[1], Shang-Yu Lin[1], Pei-Zen Chang[1], Tay-Jyi Lin[2], and Wei-Chang Li[1]
[1]National Taiwan University, TAIWAN and 2National Chung Cheng University, TAIWAN

W4P.086 TUNABLE PIEZOELECTRIC MEMS MICROPHONE BASED ON INVERSE PIEZOELECTRIC EFFECT
Zhuoyue Zheng[1], Xinyu Wu[2], Chen Wang[2], Luo Huahuang[4], Pan Zhang[3], Qingqing Ke[4], Yuan Wang[1], Rui P. Martins[1], and Pui-in Mak Mak[1]
[1]University of Macau, CHINA, [2]University of Leuven, BELGIUM, [3]Peking University, CHINA, and [4]Sun Yat-sen University, CHINA

W4P.087 ULTRASOUND-BASED BATTERY STATE-OF-CHARGE MONITORING AND HEALTH EVALUATION USING HIGH DIRECTIVITY MEMS TRANSDUCER
Jiao Xia, Junhao Wang, Chong Yang, Yinjun Wu, Peng Huang, and Yipeng Lu
Peking University, CHINA

Monday - RF MEMS, Resonators and Oscillators

M3P.088 EMERGENCE OF EXCEPTIONAL POINTS IN HYBRID COUPLED RESONATORS THROUGH UNI-DIRECTIONAL NEGATIVE DIGITAL SPRING
Bernardo P. Madeira[1], Yuan Wang[2], Chun Zhao[3], Xinyu Wu[1], Michael Kraft[1], and Chen Wang[1]
[1]KU Leuven, BELGIUM, [2]University of Macau, CHINA, and [3]University of York, UK

M3P.089 EXPERIMENTAL OBSERVATION OF THE ACOUSTOELECTRIC EFFECT IN MONOLITHICALLY INTEGRATED ALSCN/SIC HETEROSTRUCTURES
Xingyu Du[1], Chin-Yu Chang[1], Yunfei He[1], Chloe Leblanc[1], Matthew Eichenfield[2,3], Deep Jariwala[1], and Roy Olsson[1]
[1]University of Pennsylvania, USA, [2]University of Arizona, USA, and [3]Sandia National Labs, USA

M3P.090 GIGAHERTZ FOCUSING ACOUSTIC DELAY LINES FOR PHONONIC INTEGRATED CIRCUITS
Jiawei Li[1,2,3], Yang Li[1], and Tao Wu[1,2,3]
[1]ShanghaiTech University, CHINA, [2]Chinese Academy of Sciences, CHINA, and [3]Shanghai Engineering Research Center of Energy Efficient and Custom AI IC, CHINA

M3P.091 INTEGRATING A MEMS SPEAKER WITH A SLOT DIPOLE ANTENNA: A WIRELESS AND BATTERYLESS ACOUSTIC TRANSDUCER
Raul Ruiz and Gabriel Abadal
Universitat Autonoma de Barcelona, SPAIN

M3P.092 MAGNETICALLY TUNABLE GIGAHERTZ PHASE SHIFTERS UTILIZING MULTIFERROIC COMPOSITE THIN FILM STRUCTURES
Mingye Du[2], Chuang Man[1], Yuxi Wang[2], Daozheng Luo[1], Xuankai Xu[1], Fengyu Liu[1], Lu Sun[1], Yumeng Yang[2], and Tao Wu[3]
[1]ShanghaiTech University, CHINA, [2]Chinese Academy of Sciences, CHINA, and [3]Shanghai Engineering Research Center of Energy Efficient and Custom AI IC, CHINA

M3P.093 NEW METHOD FOR EVALUATING INTRINSIC MECHANICAL Q FACTOR OF SCALN, GAN, METAL FILMS BY GHZ ULTRASONIC PULSE-ECHO TECHNIQUE
Cocono Mita[1,2], Yohkoh Shimano[1,2], and Takahiko Yanagitani[1,2]
[1]Waseda University, JAPAN and [2]ZAIKEN, JAPAN

M3P.094 SAW EXCITATION BY SOLID FLAT ELECTRODE ON PERIODICALLY POLARIZATION INVERTED STRUCTURE FOR NOVEL RF FILTER
Yuichiro Hidaka[1,2], Satoshi Matumura[1,2], Naoki Ono[1,2], Yohkoh Shimano[1,2], and Takahiko Yanagitani[1,2]
[1]Waseda University, JAPAN and [2]ZAIKEN, JAPAN

M3P.095 SURFACE ACOUSTIC WAVE / SPIN WAVE COUPLING BEHAVIOUR OF SCALN/SI BASED SAW DEVICES AT CRYOGENIC TEMPERATURES
Ioana Zdru[1], Claudia Nastase[1], Andrei Florescu[1], George Boldeiu[1], Daniele Narducci[2], Monica Nedelcu[1], Dan Vasilache[1], Sergiu Iordanescu[1], Alexandra Nicoloiu[1], Christoph Adelmann[2], Adrian Dinescu[1], Mathias Weiler[3], Florin Ciubotaru[2], Phillipp Pirro[3], and Alexandru Müller[1]
[1]IMT Bucharest, ROMANIA, [2]imec, BELGIUM, and [3]Fachbereich Physik and Landesforschungszentrum OPTIMAS, RPTU Kaiserslautern-Landau, GERMANY

M3P.096 THIN-FILM SCANDIUM ALUMINUM NITRIDE BULK ACOUSTIC RESONATOR WITH HIGH Q OF 208 AND K2 OF 9.5% AT 12.5 GHZ
Sinwoo Cho[1], Yinan Wang[1], Eugene Kwon[2], Lezli Matto[2], Omar Barrera[1], Michael Liao[2], Jack Kramer[1], Tzu-Hsuan Hsu[1], Vakhtang Chulukhadze[1], Ian Anderson[1], Mark Goorsky[2] and Ruochen Lu[1]
[1]University of Texas, Austin, USA and [2]University of California, Los Angeles, USA

Tuesday - RF MEMS, Resonators and Oscillators

T3P.088 A 16 GHZ TOPOLOGICAL ELECTRICAL CIRCUIT USING INTERCHIP MUTUAL INDUCTANCE FABRICATED BY DUAL-DAMASCENE PROCESS
Ryohei Takahashi, Shun Yasunaga, Tetsuya Iizuka, Akio Higo, Ryosho Nakane, Motohiko Ezawa, and Yoshio Mita
University of Tokyo, JAPAN

T3P.089 BAW TRANSFORMER FOR RECTENNA USING 12-LAYER POLARIZATION INVERTED STRUCTURE
Yuichiro Hidaka[1,2], Sarina Kinoshita[1,2], Yohkoh Shimano[1,2], and Takahiko Yanagitani[1,2]
[1]Waseda University, JAPAN and [2]ZAIKEN, JAPAN

T3P.090 GEOMETRICAL MODE-MATCHING IN A (100) SINGLE-CRYSTALLINE SILICON, SMOOTH-QUATREFOIL DISK RESONATOR
Danny A. Kassie[1], Gabrielle D. Haddon-Vukasin[2], Michael Feldman[1], Thomas W. Kenny[2], and David Elata[1]
[1]Technion - Israel Institute of Technology, ISRAEL and 2Stanford University, USA

T3P.091 HIGH SENSITIVITY OF FILM BULK ACOUSTIC RESONATOR SENSORS BASED ON NONLINEAR PT SYMMETRIC SYSTEM
Zhenyu Wei, Jianqiu Huang, and Qing'an Huang
Southeast University, CHINA

T3P.092 LITHIUM NIOBATE ACOUSTIC RESONATORS OPERATING BEYOND 900_C
Walter Gubinelli[1], Hasan Karaca[2], Ryan Tetro[1], Sariha N. Azad[2], Philip Feng[2], Luca Colombo[1], and Mattero Rinadli[1]
[1]Northeastern University, USA and [2]University of Florida, USA

T3P.093 MOS2 NANO-RESONANT SENSOR BASED ON INTERNAL RESONANCE STATE EXCITATION FREQUENCY COMB
Zhujie Zhao, Lijia Zhang, Jiajia Xiang, Hongyang Xiao, Maogang Li, Yizhou Wang, Hao Lyu, Yuanlin Xia, Zhuqing Wang, and Cao Xia
Sichuan University, CHINA

T3P.094 NOVEL TESTBED FOR ACOUSTOELECTRIC LOSS ANALYSIS IN LAMB WAVE LITHIUM NIOBATE ON SILICON DELAY LINES
Tanvir Hasan, Hakhamanesh Mansoorzare, and Reza Abdolvand
University of Central Florida, USA

T3P.095 SCALABLE 3D MICROPILLAR FREQUENCY SELECTIVE DEVICES FOR LOW-LOSS TERAHERTZ BANDPASS APPLICATIONS
Md Mufassal Ahmad[1], Danil Khaiumov[1], Jun Ying Tan[1], Cheolbok Kim[2], Jens Neu[1], and Jungkwun 'JK' Kim[1]
[1]University of North Texas, USA and [2]Corning Incorporated, USA

T3P.096 THERMAL RESILIENCE OF SUSPENDED THIN-FILM LITHIUM NIOBATE ACOUSTIC RESONATORS UP TO 550 °C
Mihir Chaudhari, Naveed Ahmed, Vivek Tallavajhula, Joshua Campbell, Yinan Wang, Ziran Du, and Ruochen Lu
University of Texas, Austin, USA

T3P.097 WIDE-BAND ACOUSTIC DELAY LINES BASED ON DUAL SINGLE-PHASE UNIDIRECTIONAL TRANSDUCERS
Yang Li[1], Jiawei Li[1], and Tao Wu[1,2,3]
[1]ShanghaiTech University, CHINA, [2]Chinese Academy of Sciences, CHINA, and
[3]Shanghai Engineering Research Center of Energy Efficient and Custom AI IC, CHINA

Wednesday - RF MEMS, Resonators and Oscillators

W4P.088 A SPURIOUS-MODE-SUPPRESSED AND Q-ENHANCED CIRCULAR-CRESTED LAMB WAVE RESONATOR
Xianzheng Lu[1], Liang Lou[2,3], and Hao Ren[1]
[1]ShanghaiTech University, CHINA, [2]Shanghai University, CHINA, and
[3]Shanghai Industrial Technology Research Institute, CHINA

W4P.089 ENHANCED FREQUENCY STABILITY IN A BLUE-SIDEBAND EXCITED MEMS RESONATOR WITH PHONONIC-FREQUENCY-COMBS-LIKE BEHAVIOUR
Jingqian Xi[1,2], Erion Uka[2], and Chun Zhao[1]
[1]University of York, UK and [2]Huazhong University of Science and Technology, CHINA

W4P.090 GIGAHERTZ BENDING ACOUSTIC WAVEGUIDES IN ALUMINUM SCANDIUM NITRIDE FILM
Yang Li[1,2], Lihui Jin[1,2], Jiawei Li[1,2], and Daozheng Luo[1,2]
[1]ShanghaiTech University, CHINA and [2]Chinese Academy of Sciences, CHINA

W4P.091 HIGH-PERFORMANCE SOLIDLY MOUNTED BIDIMENSIONAL MODE RESONATORS (S2MRS) OPERATING AROUND 16 GHZ
Luca Spagnuolo, Luca Colombo, Kapil Saha, Gabriel Giribaldi, Pietro Simeoni, and Matteo Rinaldi
Northeastern University, USA

W4P.092 LITHIUM TANTALATE BULK ACOUSTIC RESONATOR FOR PIEZOELECTRIC POWER CONVERSION
Ziqian Yao[1], Clarissa Daniel[2], Eric Stolt[2], Vakhtang Chulukhadze[1], Juan Rivas Davila[2], and Ruochen Lu[1]
[1]University of Texas, Austin, USA and [2]Stanford University, USA

W4P.093 NBN SUPERCONDUCTING ELECTRODES FOR CRYOGENIC LAMB WAVE RESONATORS ON LITHIUM NIOBATE WITH ENHANCED QUALITY FACTORS
Wenzhen Li[1], Yushuai Liu[1], Jiawei Li[1], Peng Dong[1], Jun Li[1], and Tao Wu[1,2]
[1]ShanghaiTech University, CHINA and [2]Chinese Academy of Sciences, CHINA

W4P.094 REVEALING HIDDEN RESONANCES THROUGH AN INNOVATIVE BONDING WIRE STRATEGY
Zhong-Wei Lin and Sheng-Shian Li
National Tsing Hua University, TAIWAN

W4P.095 STRIP-LOADED OVERLAY SH0 WAVEGUIDE BASED DIRECTIONAL COUPLERS IN THIN FILM LITHIUM NIOBATE ON INSULATOR
Chuan Tian, Jack Guida, and Siddhartha Ghosh
Northeastern University, USA

W4P.096 THIN-FILM PIEZOELECTRIC SUSPENDED MEMS RESONATORS FOR REDUCING ANCHOR LOSS
Maliha Sultana, Hamed Atashbar, Tanvir Hasan, Hakhamanesh Mansoorzare, and Reza Abdolvand
University of Central Florida, USA

Monday - Wearable and In-Vivo Medical Devices and Microsystems

M3P.097 3D-PRINTED OPTOGENETIC DEVICE WITH A RECORDING-CHANNEL-EMBEDDED WAVEGUIDE
Keonghwan Oh[1] and Sohmyung Ha[2]
[1]New York University, Abu Dhabi, UAE and 2New York University, USA

M3P.098 A SILK-BASED BIDIRECTIONAL FLEXIBLE EXTRAVASCULAR BIOINTERFACE
Xiner Wang[1], Weijian Fan[2], Yuxin Liu[1], Li Chen[2], Erda Zhou[1], Xiaoling Wei[1], Liuyang Sun[1], Bo Yu[2], Jinyun Tan[2], Tiger H. Tao[1], and Zhitao Zhou[1]
[1]Chinese Academy of Sciences, CHINA and [2]Huashan Hospital of Fudan University, CHINA

M3P.099 AN INTRABODY ULTRASOUNIC FREQUENCY MODULATION COMMUNICATION MICROSYSTEM BASED ON PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS
Chenyuan Zhang, Chong Yang, Yiwei Guo, Xinyue Zhang, Zhihong Li, and Bowen Sheng, Yipeng Lu
Peking University, CHINA

M3P.100 ELASTICITY-INDEPENDENT ANGLE DETECTION FOR DIRECTIONAL PALPATION USING A MICROFINGER BY INTEGRATED DESIGN OF FLEXIBLE STRAIN SENSORS
Yuto Hori and Satoshi Konishi
Ritsumeikan University, JAPAN

M3P.101 IMPLANTABLE ELECTRONIC DEVICES BASED ON OMNIDIRECTIONAL PRE-STRETCHED SILK FILMS
Siyuan Ni[1], Huiran Yang[1], Ziyi Zhu[1], Zhengyu Liang[1], Dujuan Zou[1], Jianbo Jiang[1], Wenyuan Liu[1], Zhitao Zhou[1], Liuyang Sun[1], Tiger H. Tao[2,3], Xiaoling Wei[1], and Keyin Liu[1]
[1]Chinese Academy of Sciences, CHINA,
[2]Guangdong Institute of Intelligence Science and Technology, CHINA, and
[3]Tianqiao and Chrissy Chen Institute for Translational Research, CHINA

M3P.102 REAL-TIME MONITORING OF HAPTIC RESPONSE USING ULTRA-THIN SI/PZT STACKED SENSORS AND ACTUATORS IN SOFT FLEXIBLE PACKAGING FOR WEARABLE AND MEDICAL APPLICATIONS
Daniel Zymelka[1], Toshihiro Takeshita[1], Yusuke Takei[1], Takeshi Kobayashi[1], and Takashi Hanakawa[2]
[1]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and
[2]Kyoto University, JAPAN

M3P.103 ROBOTIC ACTUATION MODULE TOWARD A SUBEPITHELIAL SEROTONIN SENSING INGESTIBLE CAPSULE
Sydney N. Overton, Michael A. Straker, and Reza Ghodssi
University of Maryland, College Park, USA

M3P.104 ULTRASONICALLY POWERED IMPLANTABLE MICRODEVICE PLATFORM FOR WIRELESS IN-SITU MULTIMODAL CANCER THERAPY
Sophia Selvarajan and Albert Kim
University of South Florida, USA

Tuesday - Wearable and In-Vivo Medical Devices and Microsystems

T3P.098 A BIOCOMPATIBLE AND HIGH-SENSITIVE EPIDERMAL GLUCOSE BIOSENSOR MODIFIED BY AN ENHANCED CATALYTIC ZWITTERIONIC HYDROGEL
Wenjun Li, Chengcheng Li, Yuxiao Ma, Wangwang Zhu, Xingguo Zhang, Hao Zheng, Dachao Li, and Zhihua Pu
Tianjin University, CHINA

T3P.099 A VARIABLE-STIFFNESS CATHETER WITH INTEGRATED FORCE SENSING FOR SURGICAL APPLICATIONS
Xiaotong Guo[1], Qindong Zheng[1], Jinshi Zhao[1], Burak Temelkuran[1], Bing Li[2], and Eric Yeatman[1]
[1]Imperial College, London, UK and [2]University College, London, UK

T3P.100 BALLOON CATHETER WITH INTEGRATED AIRFLOW SENSOR FOR RESPIRATION MEASUREMENT INSIDE LUNG AIRWAY
Jun Yoshida[1], Muhammad Salman Al Farisi[1], Yoshihiro Hasegawa1, Miyoko Matsushima[2], Tsutomu Kawabe[2], and Mitsuhiro Shikida[1]
[1]Hiroshima City University, JAPAN and [2]Nagoya University, JAPAN

T3P.101 ELECTRODE SHAPE OPTIMIZATION FOR ROBUST INTERFACE BETWEEN ULTRA THIN FILM AND METAL ELECTRODE
Takashi Sato[1], Aoi Okonogi[2], Fujita Hajime[2], Tatsumi Horii[2], Junya Kurumida[1], Toshinori Fujie[2], and Eiji Iwase[3]
[1]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN,
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T3P.102 LAYER BY LAYER ASSEMBLY OF ALTERNATING SACRIFICIAL MICROFLUIDIC CHANNEL TEMPLATE WITH STRUCTURAL SILICONE FOR MULTILAYER MICROFLUIDIC BLOOD OXYGENATOR FABRICATION
Anand Sojan and Ponnambalam RAVI. Selvaganapathy
McMaster University, CANADA

T3P.103 RING-SHAPED MICROPARTICLE AUTONOMOUSLY ANCHORED IN MICROCHANNEL FOR INTRAVASCULAR IMPLANTABLE DEVICES
Masaaki Oshita, Tetsuo Kan, and Kazuto Masamoto
University of Electro-Communications, JAPAN

T3P.104 SPECTRAL ANALYSIS OF CAROTID ARTERY VIBRATIONS USING A WEARABLE SEISMIC PATCH FOR DETECTION OF STENOSIS AND DISSECTION
Houriyeh Majditehran[1], Nia Desai[1], Brian Sang[1], Jin-Woo Park[2], Haoran Wen[2], Greg Junek[2], Fadi Nahab[3], and Farrokh Ayazi[1,2]
[1]Georgia Institute of Technology, USA, [2]StethX Microsystems Inc., USA, and [3]Emory School of Medicine, USA

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W4P.097 3D LIPID MICROROBOTS FOR SIMULTANEOUS DELIVERY OF LIPOPHILIC AND HYDROPHILIC DRUGS.
Jongeon Park, Arnaud Bertsch, and Juergen Brugger
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

W4P.098 A CMOS-MEMS NEURAL RECORDING SYSTEM BASED ON IN-SITU INTEGRATION OF CMOS CHIPS ON NEURAL PROBE
Haoyuan Chen, Longchun Wang, Jiawei Cao, Ning Wei, Zixing Li, Jingjing An, Kaijie Yang, Fangtao Kuang, Zhiyue Yang, Zhiyuan Du, and Jing-quan Liu
Shanghai Jiao Tong University, CHINA

W4P.099 ACCURATE SUBCUTANEOUS GLUCOSE PREDICTION BASED ON REVERSE IONTOPHORESIS WITH SKIN SURFACE PH CALIBRATION
Wangwang Zhu, Haixia Yu, Xi Li, Wenjun Li, Chenxi Jin, Hao Zheng, Xingguo Zhang, Dachao Li, and Zhihua Pu
Tianjin University, CHINA

W4P.100 DEVELOPMENT OF INFILTRATING MICRONEEDLE ARRAYS FOR DRUG DELIVERY SYSTEM OF BIOMACROMOLECULES
Genta Furuhashi[1], Haruna Kozuki1, Masato Fujioka[2], and Yuta Kurashina[1]
[1]Tokyo University of Agriculture and Technology, JAPAN and [2]Kitasato University, JAPAN

W4P.101 HOLLOW MICROCATHETER ACTUATOR AND MEMS THERMAL FLOW SENSOR HYBRIDIZATION TOWARD RESPIRATION MEASUREMENT INSIDE 1 MM DIAMETER BRONCHIOLES IN LUNG AIRWAY
Aoi Hirayama[1], Muhammad Salman Al Farisi[1], Yoshihiro Hasegawa[1], Miyoko Matsushima[2], Tsutomu Kawabe[2], and Mitsuhiro Shikida[1]
[1]Hiroshima City University, JAPAN and [2]Nagoya University, JAPAN

W4P.102 MICROPOCKET-INTEGRATED MICRONEEDLE WOUND DRESSING WITH PH-RESPONSIVE ACTUATION FOR ENHANCED DRUG DELIVERY
Mahsa Rastegar Pour[1], Dongjoon Lee[2], Syed Hassan Mehdi[2], Rana Saha[3], Jun Ying Tan[1], Donghoon Yoon[2], Albert Kim[4], and Jungkwun 'JK' Kim[1]
[1]University of North Texas, USA, [2]University of Arkansas for Medical Sciences, USA, [3]University of South Florida, USA, and [4]University of South Florida, USA

W4P.103 SMART SKIN FOR FLAPPING-WING ROBOTICS WITH ENVIRONMENT SENSING AND ATTITUDE MONITORING CAPABILITIES
Fangyu Zhao, Nan Qin, and Tiger H. Tao
Chinese Academy of Sciences, CHINA

W4P.104 TRANSFLEX: A FLEXIBLE MULTI-SHANK IMPLANTABLE NEUROELECTRODE WITH VARIABLE STIFFNESS BASED ON PATTERNABLE SOLUBLE DEXTRAN-PULLULAN SUPPORT LAYER
Zhitong Zhang, Lexuan Yang, Xiaoyong Tang, Yarui Li, Jiayan Zhang, Zhe Huang, Yu-Qing Zheng, and Zhihong Li
Peking University, CHINA