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MONDAY PROGRAM

24 JUNE

monday

08:30 - 09:10	**Welcome Address** **General Chair:** Christofer Hierold, *ETH Zürich, SWITZERLAND* **Technical Program Introduction** **Program Chair:** Jürgen Brugger *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*
09:00 - 09:45	**Plenary Presentation I** **Session Chair:** Karl Bohringer, *University of Washington, USA* **M1A.P01** **HUMAN ORGANS-ON-CHIPS** . . . . . **N/A** **Donald Ingber** *Harvard University, USA,* *Harvard Medical School, USA, and* *Boston Children's Hospital, USA*
09:45 - 10:00	**2019 IEEE Daniel E. Noble Award for Emerging Technologies Recipient** Thomas W. Kenny *Stanford University, USA*
10:00 - 10:15	**2019 Transducers Early Career Award Recipient** Dana Weinstein *Purdue University, USA*
10:15 - 11:00	**Break and Exhibit Inspection**

Inner Courtyard of a Berlin apartment building

monday

Session M2A - Bio Microfluidics

Session Co-Chairs: Jochen Kieninger, *University of Freiburg, GERMANY* and Andreu Llobera, *Carl Zeiss Vision, GERMANY*

Convention Hall I - A/B

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[1]*China-Japan Friendship Hospital, CHINA and*
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[1]*Chinese Academy of Sciences (CAS), CHINA and*
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[1]*Sharp Corporation, JAPAN,* [2]*University of Tokyo, JAPAN and*
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Session Co-Chairs: Marina Cole, *University of Warwick, UK*
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[1]*Kyoto University, JAPAN and* [2]*University of Fukui, JAPAN*

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[2]*Veterans Administration Ann Arbor Healthcare System, USA*

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[1]*Tsinghua University, CHINA and* [2]*University of California, Berkeley, USA*

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[1]*Tianjin University, CHINA and* [2]*Nankai University, CHINA*

monday

Session M2C - Acoustic Devices

Session Co-Chairs: Leland "Chip" Spangler, *Aspen Microsystems, LLC, USA* and Shuji Tanaka, *Tohoku University, JAPAN*

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University of Grenoble, Alpes, CEA LETI, FRANCE

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Session Co-Chairs: Danick Briand, *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND* and Wei Wang, *Peking University, CHINA*

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University of Freiburg, GERMANY

monday

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[1]*Universität Bremen, GERMANY and*
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[1]*Chinese Academy of Sciences (CAS), CHINA,*
[2]*University of Chinese Academy of Sciences, CHINA, and*
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Centre Suisse d'Electronique et de Microtechnique (CSEM), SWITZERLAND

12:30 - 14:30 | **Lunch on Own in Exhibit Hall**

monday

13:30 - 14:30	**Industrial Stage Session 1** (Exhibit Hall) **Chair:** Dave Monk, *NXP, USA* **1a** Heidelberg Instruments & SwissLitho, GERMANY **1b** scia Systems GmbH, GERMANY **1c** i-ROM GmbH, GERMANY **1d** Innovative Sensor Technology IST AG, SWITZERLAND
14:30 - 16:30	**Poster Session M3P and Exhibit Inspection** (refreshments will be served) Poster presentations are listed by topic category with their assigned number starting on page 51.
16:30	**Adjourn for the Day**
18:30 - 22:00	**Monday Evening at the Orangerie** Charlottenburg Palace

Berlin Oberbaumbrücke

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TUESDAY PROGRAM

25 JUNE

tuesday

08:30 - 09:15	**Plenary Presentation II** Session Chair: Eric Yeatman, *Imperial College London, UK* T1A.P02 **LEARNING CAUSAL MECHANISMS** ..... **N/A** **Bernhard Schölkopf** *Max Planck Institute for Intelligent Systems, GERMANY*
09:15 - 09:30	**Transducers 2021 Announcement**
09:30 - 09:45	**Transition**

Statue in Berlin

Session T1A - Lab on a Disc

Session Co-Chairs: Victor J. Cadarso, *Monash University, AUSTRALIA*
and Michael Vellekoop, *University of Bremen, GERMANY*

Convention Hall I - A/B

09:45 - 10:00

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[1]*Hahn-Schickard, GERMANY and* [2]*University of Freiburg, GERMANY*

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[1]*University of California, Berkeley, USA and*
[2]*National Chiao Tung University, TAIWAN*

10:30 - 10:45

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[1]*Hahn-Schickard, GERMANY and* [2]*University of Freiburg, GERMANY*

Panorama photo Berlin – House of Cultures

tuesday

Session T1B - E&M Field Sensors I

Session Co-Chairs: Alissa Fitzgerald, *A.M. Fitzgerald & Associates, LLC, USA* and Pietro Siciliano, *Institute for Microelectronics and Microsystems IMM-CNR, ITALY*

Convention Hall I - C

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[1]*Melexis, SWITZERLAND and* [2]*University of Freiburg, GERMANY*

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Song Liu[1,2], Hengmao Liang[1,2], and Bin Xiong[1]
[1]*Chinese Academy of Sciences (CAS), CHINA and*
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[1]*Hong Kong University of Science and Technology, HONG KONG,*
[2]*Shenzhen CoilEasy Technologies Limited, CHINA,*
[3]*University of Electronic Science and Technology of China, CHINA, and*
[4]*Mornsun Guangzhou Science & Technology Co., Ltd., CHINA*

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Sagnik Ghosh and Joshua Lee
City University of Hong Kong, HONG KONG

Oberbaum bridge in Belin.

Session T1C - Ultrasonic I

Session Co-Chairs: Guo-Hua Feng, *National Chung Cheng University, TAIWAN* and Michael Kraft, *University of Leuven (KU Leuven), BELGIUM*

Convention Hall I - D

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IMEC, BELGIUM

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University of Leuven (KU Leuven), BELGIUM

Berlin Skyline City Panorama with Traffic and Sunset.

tuesday

Session T1D - Nanosensors

Session Co-Chairs: Donatella Puglisi, *Linköping University, SWEDEN*
and Xiaohong Wang, *Tsinghua University, CHINA*

Hall Europa

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[1]*Iowa State University, USA and* [2]*University of Nebraska, USA*

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[1]*University of California, Berkeley, USA and*
[2]*University of California, San Francisco, USA*

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The park and gardens of Charlottenburg

Session T1E - Fabrication Technologies I

Session Co-Chairs: Michel Despont, *CSEM SA, SWITZERLAND*
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Room 1 (upstairs)

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[2]*Japan Science and Technology Agency (JST), JAPAN*

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[2]*Technical University Braunschweig, GERMANY*

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Taiwan Semiconductor Manufacturing Company (TSMC), TAIWAN

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[1]*Chinese Academy of Sciences (CAS), CHINA and*
[2]*University of Chinese Academy of Sciences, CHINA*

10:45 - 11:15	**Break and Exhibit Inspection**

Session T2A - Microfluidics I

Session Co-Chairs: Uwe Schnakeneberg, *RWTH Aachen University, GERMANY* and Niels Tas, *University of Twente, THE NETHERLANDS*

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12:00 - 12:15

12:15 - 12:30

12:30 - 12:45

Session T2B - E&M Field Sensors II

Session Co-Chairs: Honglong Chang, *Northwestern Polytechnical University, CHINA* and Franz Laermer, *Robert Bosch GmbH, GERMANY*

Convention Hall I - C

11:15 - 11:45

T2B.001 **INVITED SPEAKER**
QUANTUM SENSORS IN DIAMOND: TECHNOLOGY ROADMAP . . . . . **N/A**
Christian Degen[1], Gabriel Puebla-Hellmann[1,2], and Jan Rhensius[1,2]
[1]*ETH Zürich, SWITZERLAND and* [2]*QZabre LLC, SWITZERLAND*

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[1]*Chinese Academy of Sciences (CAS), CHINA and*
[2]*University of Chinese Academy of Sciences, CHINA*

12:00 - 12:15

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Jiaju Liang, Yongcun Hao, Hao Kang, Bing Ruan, and Honglong Chang
Northwestern Polytechnical Univerisity, CHINA

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Boston University, USA

End of Session T2B - E&M Field Sensors II

Session T2C - Ultrasonic II

Session Co-Chairs: Nuria Barniol, *Universitat Autonoma de Barcelona, SPAIN* and Yu-Ting Cheng, *National Chiao Tung University , TAIWAN*

Convention Hall I - D

11:15 - 11:30

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Sedat Pala and Liwei Lin
University of California, Berkeley, USA

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University of California, Davis, USA

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Korea Advanced Institute of Science and Technology (KAIST), KOREA

12:15 - 12:30

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[1]*Tohoku University, JAPAN and* [2]*Panasonic Corporation, JAPAN*

12:30 - 12:45

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Sina Sadeghpour, Bram Lips, Michael Kraft, and Robert Puers
University of Leuven (KU Leuven), BELGIUM

Session T2D - Nanoscale Devices & Experiments

Session Co-Chairs: Joan Bausells, *CSIC, SPAIN*
and Jongbaeg Kim, *Yonsei University, KOREA*

Hall Europa

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[1]*Case Western Reserve University, USA and* [2]*Xidian University, CHINA*

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Peking University, CHINA

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[1]*Chinese Academy of Sciences (CAS), CHINA and*
[2]*University of Chinese Academy of Sciences, CHINA*

12:00 - 12:15

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[1]*RWTH Aachen University, GERMANY, and* [2]*Forschungszentrum Jülich, GERMANY, and* [3]*University of Oxford, UK*

12:15 - 12:30

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[1]*Peking University, CHINA,* [2]*Peking University Health Science Center, CHINA, and* [3]*Shanghai Jiao Tong University, CHINA*

12:30 - 12:45

T2D.006 **ENRICHMENT OF EXTRACELLULAR VESICLES VIA LIPID NANOPROBE-FUNCTIONALIZED NANOSTRUCTURED SILICA MICRODEVICE** 273
Yuan Wan[1,2], Mackenzie Maurer[2], Hong-Zhang He[2], Yi-Qiu Xia[2], Wen-Long Zhang[2], Si-Jie Hao[2], Nelson Yee[3], and Si-yang Zheng[2]
[1]*Binghamton University, USA,* [2]*Pennsylvania State University, USA, and* [3]*Penn Sate College of Medicine, USA*

Session T2E - Fabrication Technologies II

Session Co-Chairs: Nicole Kerness, *Kionix, USA*
and Frank Niklaus, *KTH Royal Institute of Technology, SWEDEN*

Room 1 (upstairs)

tuesday

11:15 - 11:30

T2E.001 **A NOVEL METHOD FOR MEMS WAFER-LEVEL PACKAGING: SELECTIVE AND RAPID INDUCTION HEATING FOR COPPER-TIN SLID BONDING** 277
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[1]*Fraunhofer ENAS, GERMANY and* [2]*Chemnitz University of Technology, GERMANY*

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Yan. Xing[1], Zhiyue. Guo[1], Guorong Wu[1], and Miguel A. Gosalvez[2]
[1]*Southeast University, CHINA and*
[2]*University of the Basque Country, SPAIN*

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Sheng-Kai Yeh and Weileun Fang
National Tsing Hua University, TAIWAN

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Simon Fichtner[1,2], Dirk Kaden[1], Fabian Lofink[1], and Bernhard Wagner[1,2]
[1]*Fraunhofer ISIT, GERMANY and* [2]*University of Kiel, GERMANY*

12:15 - 12:45

T2E.005 **INVITED SPEAKER**
EVOLVING FUNCTIONALITY IN DISORDERED NANOSYSTEMS . . . . . **N/A**
Wilfred G. van der Wiel
University of Twente, THE NETHERLANDS

12:45 - 14:30	**Lunch on Own in Exhibit Hall**

13:30 - 14:30	**Industrial Stage Session 2** (Exhibit Hall) **Chair:** Francois Dion, *Teledyne DALSA, CANADA* **2a** SPTS Technologies LTD, UK **2b** Robert Bosch GmbH, GERMANY **2c** IntelliSense Software Corp., USA **2d** Nanoscribe GmbH, GERMANY
14:30 - 16:30	**Poster Session T3P and Exhibit Inspection** (refreshments will be served) Poster presentations are listed by topic category with their assigned number starting on page 51.

Berlin Cathedral, Berliner Dom

tuesday

Session T4A - *In-Vivo* Sensing

Session Co-Chairs: Ryuji Yokokawa, *Kyoto University, JAPAN*
and Wei Wang, *Peking University, CHINA*

Convention Hall I - A/B

16:30 - 16:45

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17:00 - 17:15

17:15 - 17:30

17:30 - 17:45

17:45 - 18:00

Session T4B - Hydrogen Sensing

Session Co-Chairs: Karl Bohringer, *University of Washington, USA*
and Thomas Maeder, *EPFL, SWITZERLAND and MIPT, RUSSIA*

Convention Hall I - C

16:30 - 16:45

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Dongsheng Xu[1,2], Dan Zheng[2], Pengcheng Xu[1], Ying Chen[1], and Xinxin Li[1]
[1]*Chinese Academy of Sciences (CAS), CHINA and*
[2]*Shanghai Institute of Technology, CHINA*

16:45 - 17:00

T4B.002 **A CMOS-BASED THERMO-ELECTROCATALYTIC GAS SENSOR FOR SELECTIVE AND LOW-LEVEL DETECTION OF CARBON MONOXIDE AND HYDROGEN** 322
Claudio Zuliani[1], Richard Hopper[1], Marco Musto[1], Andrea De Luca[2], Claudio Falco[2], and Florin Udrea[2]
[1]*ams Sensors UK, UK and* [2]*University of Cambridge, UK*

17:00 - 17:15

T4B.003 **HIGHLY SENSITIVE AND SELECTIVE HYDROGEN GAS SENSOR WITH PLATINUM NANOPARTICLES LINKED BY 4,4''-DIAMINO-P-TERPHENYL (DATER)** 326
Anmona S. Pranti, Daniel Loof, Sebastian Kunz, Volkmar Zielasek, Marcus Bäumer, and Walter Lang
University of Bremen, GERMANY

17:15 - 17:30

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[1]*Toyohashi University of Technology, JAPAN and*
[2]*University of Yamanashi, JAPAN*

17:30 - 17:45

T4B.005 **SELF-POWERED, ULTRA-RELIABLE HYDROGEN SENSOR EXPLOITING CHEMOMECHANICAL NANO-TRANSDUCER AND SOLAR-CELL** 334
Min-Ho Seo, Kyungnam Kang, Jae-Shin Lee, Yongrok Jeong, Seunghye Lee, Inkyu Park, and Jun-Bo Yoon
Korea Advanced Institute of Science and Technology (KAIST), KOREA

17:45 - 18:00

T4B.006 **INTEGRATED RESONANT DUAL-MICROCANTILEVERS COMBINED SENSOR WITH ACCURATE IDENTIFICATION AND HIGHLY-SENSITIVE DETECTION TO H_2S GAS** 338
Lei Tang[1,2], Pengcheng Xu[1], Ming Li[1], Haitao Yu[1], and Xinxin Li[1]
[1]*Chinese Academy of Sciences (CAS), CHINA and*
[2]*Shanghai Normal University, CHINA*

Session T4C - Energy & Power MEMS I

Session Co-Chairs: Peter Enoksson, *Chalmers University of Technology, SWEDEN* and Xiaohong Wang, *Tsinghua University, CHINA*

Convention Hall I - D

16:30 - 16:45

T4C.001 **STUDY ON THE INFLUENCE OF FERROELECTRIC MATERIALS ON THE OUTPUT PERFORMANCE OF TRIBOELECTRIC NANOGENERATORS** 342

Xin Chen[1], Lingxiao Gao[1], Junfei Chen[1], Mengke Qi[1], Dongxiao Li[1], Shaokun Zeng[2], and Xiaojing Mu[1]

[1]*Chongqing University, CHINA and* [2]*Chongqing University of Science and Technology, CHINA*

16:45 - 17:00

T4C.002 **A CONDITIONING SYSTEM FOR HIGH-VOLTAGE ELECTROSTATIC/TRIBOELECTRIC ENERGY HARVESTERS USING BENNET DOUBLER AND SELF-ACTUATED HYSTERESIS SWITCH** 346

Hemin Zhang[1], Dimitri Galayko[2], and Philippe Basset[1]

[1]*Univerisity Paris-Est, FRANCE and* [2]*Sorbonne Université, FRANCE*

17:00 - 17:15

T4C.003 **MEMS PIEZOELECTRIC ENERGY HARVESTER POWERED WIRELESS SENSOR MODULE DRIVEN BY NOISY BASE EXCITATION** 350

Sijun Du[1,2], Yu Jia[3], Emmanuelle Arroyo[1], Sandra Fernandez[4], Stephen T. Riches[5], and Ashwin A. Seshia[1]

[1]*University of Cambridge, UK,* [2]*University of California, Berkeley,* [3]*Aston, University, UK,* [4]*McLaren Applied Technologies, UK, and* [5]*Tribus-D, UK*

17:15 - 17:30

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Hailing Fu, Zahra Sharif Khodaei, and M.H. Ferri Aliabadi

Imperial College London, UK

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Kai Wang, Xuhan Dai, Xiaojian Xiang, Guifu Ding, and Xiaolin Zhao

Shanghai Jiao Tong University, CHINA

17:45 - 18:00

T4C.006 **A 1.3 MILLIWATTS ELECTROSTATIC VIBRATIONAL ENERGY HARVESTER WITH MINIMAL REACTIVE POWER THROUGH REDUCED INTERNAL STRAY CAPACITANCES** 362

Hiroaki Honma, Yukiya Tohyama, and Hiroshi Toshiyoshi

University of Tokyo, JAPAN

Session T4D - Wearable Sensors

Session Co-Chairs: Beomjoon Kim, *University of Tokyo, JAPAN*
and Yao-Joe Yang, *National Taiwan University, TAIWAN*

Hall Europa

16:30 - 16:45

T4D.001 **HIGHLY SENSITIVE AND RELIABLE STRAIN SENSOR BASED ON MoS_2-DECORATED LASER-SCRIBED GRAPHENE FOR WEARABLE ELECTRONICS** 366
Ashok Chhetry, Hyosang Yoon, Md. Sharifuzzaman, and Jae Y. Park
Kwangwoon University, KOREA

16:45 - 17:00

T4D.002 **HIGHLY SENSITIVE CHARGE-COUPLE DEVICE-BASED FLEXIBLE PH SENSOR FOR WEARABLE HEALTH CARE APPLICATION** 370
Mao Shiomi, Shogo Nakata, Yusuke Fujita, Takayuki Arie, Seiji Akita, and Kuniharu Takei
Osaka Prefecture University, JAPAN

17:00 - 17:15

T4D.003 **WIDE RANGE-SENSITIVE, BENDING-INSENSITIVE PRESSURE DETECTION AND APPLICATION TO WEARABLE HEALTHCARE DEVICE** 374
Seunghwan Kim[1], Morteza Amjadi[2], Tae-Ik Lee[1], Yongrok Jeong[1], Donguk Kwon[3], Min Seong Kim[1], Kyuyoung Kim[1], Taek-Soo Kim[1], Yong Suk Oh[1,3], and Inkyu Park[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), KOREA,* [2]*Max-Planck Institute for Intelligent Systems, GERMANY and* [3]*Northwestern University, USA*

17:15 - 17:30

T4D.004 **TRANSIENT EPIDERMAL ELECTRONIC AND OPTOELECTRONIC DEVICES FOR MULTIDIMENSIONAL PHYSIOLOGICAL MONITORING** 378
Yujia Zhang[1], Long Sun[1], Shan Zhang[1], Feihong Xu[2], and Tiger H. Tao[1,3,4]
[1]*Chinese Academy of Sciences (CAS), CHINA,* [2]*Northwestern Polytechnic University, CHINA,* [3]*University of Chinese Academy of Sciences, CHINA and* [4]*Shanghai Technical University, CHINA*

17:30 - 17:45

T4D.005 **A FLEXIBLE PRESSURE SENSOR WITH HIGH SENSITIVITY AND BROAD MEASURING RANGE** 381
Shuai Zhao and Rong Zhu
Tsinghua University, CHINA

17:45 - 18:00

T4D.006 **THERMAL IMPRINTED SELF-POWERED TRIBOELECTRIC FLEXIBLE SENSOR FOR SIGN LANGUAGE TRANSLATION** 385
Pukar Maharjan, Trilochan Bhatta, and Jae Yeong Park
Kwangwoon University, KOREA

tuesday

Session T4E - Assembly & Self-Assembly

Session Co-Chairs: Max Fleischer, *Siemens AG, GERMANY*
and Man Wong, *Hong Kong University of Science & Technology, HONG KONG*

Room 1 (upstairs)

16:30 - 17:00

T4E.001 **INVITED SPEAKER**
PRECISE PLACEMENT OF NANO-SPHERES AND -WIRES UTILIZING BROWNIAN MOTORS IN A TUNABLE NANOFLUIDIC CONFINEMENT . . . . . **N/A**
Armin W. Knoll, Christian Schwemmer, Stefan Fringes, and Colin Rawlings
IBM Research, SWITZERLAND

17:00 - 17:15

T4E.003 **PROGRAMMABLE MICRO-OBJECT ASSEMBLY WITH TRANSFER** 390
Eugene M. Chow
PARC, USA

17:15 - 17:30

T4E.004 **HIGH-ASPECT-RATIO NEEDLE-SHAPED MOLD FABRICATION USING ROSENSWEIG INSTABILITY IN FERROFLUIDS** 394
Babak Assadsangabi, Sayed Mohammad Hashem Jayhooni, Tynan Stack, and Kenichi Takahata
University of British Columbia, CANADA

17:30 - 17:45

T4E.005 **RAPID ASSEMBLY OF DNA ORIGAMI IN MICROFLUIDIC TEMPERATURE GRADIENT** 398
Kentaro Kawai[1], Keita Hara[1], Ryota Nakamura[1], Kenta Arima[1], Kazuya Yamamura[1], and Osamu Tabata[2]
[1]*Osaka University, JAPAN and* [2]*Kyoto University, JAPAN*

17:45 - 18:00

T4E.006 **FLUIDIC SELF-ASSEMBLY TRANSFER TECHNOLOGY FOR MICRO-LED DISPLAY** 402
Seongkyu Cho[1], Daewon Lee[1], and Sunghoon Kwon[1,2]
[1]*Seoul National University, KOREA and*
[2]*Seoul National University Hospital, KOREA*

18:00	**Adjourn for the Day**

Industry Start-Up Session

Session Chair:
Felix Mayer, *SENSIRION - The Sensor Company, SWITZERLAND*

Hall Europa

18:15 -18:35

T5D.001 KEYNOTE SPEAKER
THE NEW RISE OF HARD TECH STARTUPS - PERSPECTIVES OF A VENTURE CAPITAL INVESTOR
Steffen Wagner
investiere - Venture Capital, SWITZERLAND

18:35 - 18:45

T5D.002 **A UNIVERSITY SPIN-OFF EXPERIENCE: FROM THE IDEA TO THE FIRST SAMPLES**
Andrea De Luca
Flusso, UK

18:45 - 18:55

T5D.003 **memetis - FROM MODEL TRAINS TO LAB ON A CHIP**
Marcel Gültig
memetis GmbH, GERMANY

18:55 - 19:05

T5D.004 **MuVaP: HIGH-PERFORMANCE MICRO-VALVES-AND-PUMPS**
Ardavan Shabanian
muVaP GmbH, GERMANY

19:05 - 19:15

T5D.005 **MEMS-CASTING TECHNOLOGY AND ITS APPLICATIONS**
Jiebin Gu
Shanghai MCT semiconductors, Co., Ltd., CHINA

19:15 - 19:25

T5D.006 **FILM BULK ACOUSTIC RESONATOR (FBAR) AS NEXT GENERATION MULTI-APPLICATION SENSOR**
Mario De Miguel Ramos
Sorex Sensors Ltd., UK

19:25 - 19:35

T5D.007 **MEMS-BASED SPECTROCHIP IMPLEMENTED TO HOME HEALTHCARE, FOOD SAFETY, AND BLOCKCHAIN APPLICATION**
Cheng-Hao Ko
Spectrochip Inc., TAIWAN

19:35 - 19:50

T5D.008 INVITED SPEAKER
MEMS, SENSORS, AND MICROTECHNOLOGY STARTUPS: CURRENT AND EMERGING TRENDS
Mike Pinelis
Microtech Ventures, USA

19:50 - 20:30	**Mixer**

transducers 2019
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WEDNESDAY PROGRAM

26 JUNE

08:30 - 09:15	**Plenary Presentation III** Session Chair: Man Wong, *Hong Kong University of Science & Technology, HONG KONG*
	W1A.P03 **FROM ARECIBO TO FAST, THE KINSHIP BETWEEN IMPOSSIBLE DREAMS** . . . . . **N/A** **Di Li**[1,2] and the FAST Team [1]*Chinese Academy of Sciences (CAS), CHINA and* [2]*University of Chinese Academy of Sciences, CHINA*
09:15 - 09:30	**EUROSENSORS 2020 Announcement**
09:30 - 09:45	**Transition**

wednesday

TV tower and World Clock at Alexanderplatz

Session W1A - Bio Mechanics

Session Co-Chairs: Michel Despont, *CSEM SA, SWITZERLAND*
and Andreas Dietzel, *Technische Universität Braunschweig, GERMANY*

Convention Hall I - A/B

09:45 - 10:00

W1A.001 **A MONOLITHIC POLYDIMETHYLSILOXANE PLATFORM FOR ZOOSPORE CAPTURE, GERMINATION AND SINGLE HYPHA FORCE SENSING** 409
Yiling Sun, Ayelen Tayagui, Ashley Garrill, and Volker Nock
University of Canterbury, NEW ZEALAND

10:00 - 10:15

W1A.002 **SHAPE DEFORMATION ANALYSIS OF SINGLE CELL IN 3D TISSUE UNDER MECHANICAL STIMULI** 413
Keitaro Kasahara[1], Yuta Kurashina[2], Shigenori Miura[3], Shogo Miyata[1], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN,* [2]*Tokyo Institute of Technology, JAPAN, and* [3]*University of Tokyo, JAPAN*

10:15 - 10:30

W1A.003 **TENSILE CHARACTERIZATION OF THIN BIOMEMBRANE** 417
Shinya Sakuma, Yuhao Gao, Yuichi Murozaki, and Fumihito Arai
Nagoya University, JAPAN

10:30 - 10:45

W1A.004 **A MICROTAS FOR LIQUID SAMPLE BULK MODULUS SCREENING** 421
Xi Zhang, Yao Lu, Menglun Zhang, Hongxiang Zhang, Qingrui Yang, and Wei Pang
Tianjin University, CHINA

The Reichstag building or Deutscher Bundestag

wednesday

Session W1B - Accelerometers and Gyros I

Session Co-Chairs: Clark Nguyen, University of California, Berkeley, USA
and Shuji Tanaka, *Tohoku University, JAPAN*

Convention Hall I - C

09:45 - 10:15

W1B.001 **INVITED SPEAKER**
FREQUENCY MODULATED MEMS GYROSCOPES: RECENT DEVELOPMENTS, CHALLENGES AND OUTLOOK 425
Giacomo Langfelder, Paolo Minotti, Valentina Zega, Claudia Comi, Cristiano R. Marra, Mauro Leoncini, and Marco Bestetti
Politecnico di Milano, ITALY

10:15 - 10:30

W1B.003 **3-AXIS CATCH-AND-RELEASE GYROSCOPE WITH PANTOGRAPH VIBRATION FOR LOW-POWER AND FAST START-UP APPLICATIONS** 430
Akiko Yuzawa[1], Ryunosuke Gando[1], Kei Masunishi[1], Etsuji Ogawa[1], Hiroki Hiraga[1], Yasushi Tomizawa[1], Tetsuro Itakura[1], and Tamio Ikehashi[2]
[1]*Toshiba Corporation, JAPAN and* [2]*Waseda University, JAPAN*

10:30 - 10:45

W1B.004 **A NOVEL MICRO SHELL RESONATOR GYROSCOPE WITH SIXTEEN T-SHAPE MASSES** 434
Wei Li, Xiang Xi, Kun Lu, Yan Shi, Zhanqiang Hou, Yulie Wu, Xuezhong Wu, and Dingbang Xiao
National University of Defense Technology, CHINA

The Potsdammer Platz

Session W1C - RF MEMS I

Session Co-Chairs: Farrokh Ayazi, *Georgia Institute of Technology, USA*
and Alfons Dehé, *Hahn-Schickard Gesellschaft, GERMANY*

Convention Hall I - D

09:45 - 10:00

W1C.001 **ANALYTICAL MODEL AND EXPERIMENTS OF PHASE NOISE IN OVEN-CONTROLLED MEMS RESONATORS** 438
Heng Yang[1], Ke Sun[1], Binbin Pei[1,2], Peng Zhong[1,2], and Xinxin Li[2]
[1]*Chinese Academy of Sciences (CAS), CHINA and*
[2]*University of Chinese Academy of Sciences, CHINA*

10:00 - 10:15

W1C.002 **IMAGING MULTIMODE VIBRATIONS IN HIGH-FREQUENCY ALUMINUM NITRIDE PIEZOELECTRIC NANOMEMBRANE RESONATORS** 442
Hao Jia[1], Matthew H. Matheny[2], Michael L. Roukes[2], and Philip X.-L. Feng[1]
[1]*Case Western Reserve University, USA and*
[2]*California Institute of Technology, USA*

10:15 - 10:30

W1C.003 **HIGH-Q UHF AND SHF BULK ACOUSTIC WAVE RESONATORS WITH TEN-NANOMETER HF0.5ZR0.502 FERROELECTRIC TRANSDUCER** 446
Mayur Ghatge, Glen Walters, Toshikazu Nishida, and Roozbeh Tabrizian
University of Florida, USA

10:30 - 10:45

W1C.004 **A 10 GHZ SINGLE-CRYSTALLINE SCANDIUM-DOPED ALUMINUM NITRIDE LAMB-WAVE RESONATOR** 450
Mingyo Park[1], Zhijian Hao[1], Dea Gyu Kim[1], Andrew Clark[2], Rytis Dargis[2], and Azadeh Ansari[1]
[1]*Georgia Institute of Technology, USA and* [2]*IQE Plc, USA*


Panoramic image of Berlin Cathedral and Museum Island in Berlin during sunrise.

wednesday

Session W1D - Tactile Sensors I

Session Co-Chairs: Amy Duwel, *Draper, Inc., USA* and
Jun-Bo Yoon, *Korea Advanced Institute of Science and Technology (KAIST), KOREA*

Hall Europa

09:45 - 10:00

W1D.001 **SIMULTANEOUS MEASUREMENT OF SURFACE TEXTURE AND ELASTICITY USING TACTILE SENSOR WITH DIFFERENTLY PROTRUDED CONTACTOR ARRAY** 454
Kazuki Watatani, Kyohei Terao, Fusao Shimokawa, and Hidekuni Takao
Kagawa University, JAPAN

10:00 - 10:15

W1D.002 **A HIGHLY SENSITIVE CAPACITIVE PRESSURE SENSOR WITH MICRODOME STRUCTURE FOR ROBOT TACTILE DETECTION** 458
Shan Wang, Kuan-Hua Huang, and Yao-Joe Yang
National Taiwan University, TAIWAN

10:15 - 10:45

W1D.003 **INVITED SPEAKER**
ADVANCEMENTS IN POLYMERIC CAPACITIVE TACTILE SENSORS 462
Cheng-Yao Lo
National Tsing Hua University, TAIWAN


Brandenburg Gate

Session W1E - Optical Elements & Systems

Session Co-Chairs: Adrian Neild, *Monash Unviersity, AUSTRALIA*
and Man Wong, *Hong Kong University of Science & Technology, HONG KONG*

Room 1 (upstairs)

09:45 - 10:00

W1E.001 **ASSESSMENT OF ADDITIVE MANUFACTURING PROCESSES FOR MONOLITHIC DIFFRACTIVE-REFRACTIVE MICRO-COMPONENTS** 466
Johannes Wolf[1], Susanne Grützner[1], Margit Ferstl[2], Arne Schleunitz[1], and Gabi Grützner[1]
[1]*Micro Resist Technology GmbH, GERMANY and* [2]*Fraunhofer HHI, GERMANY*

10:00 - 10:15

W1E.002 **NEXT GENERATION OF HIGHLY MINIATURIZED BULK-MEMS FABRY-PÉROT FILTERS FOR INFRARED MICROSPECTROMETERS** 470
Martin Ebermann[1], Norbert Neumann[1], Silke Hoppe[1], Karla Hiller[2], Jan Seiler[2], Christian Helke[2], Marco Meinig[3], and Steffen Kurth[3]
[1]*InfraTec GmbH, GERMANY,* [2]*Technische Universität Chemnitz, GERMANY, and* [3]*Fraunhofer ENAS, GERMANY*

10:15 - 10:30

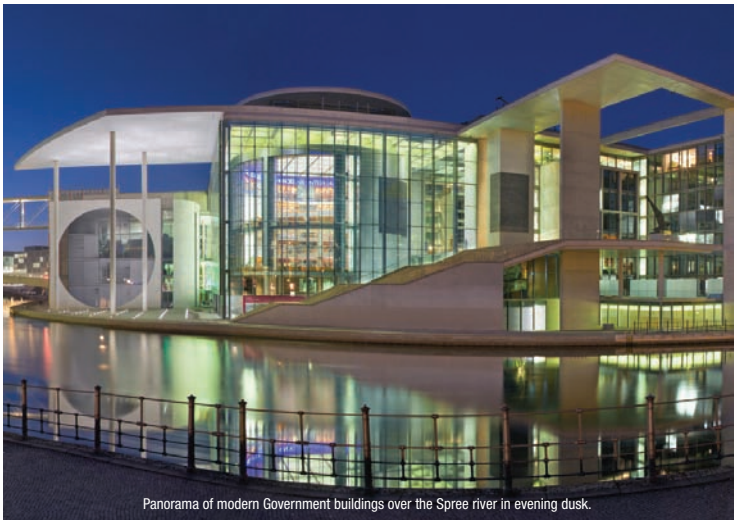
W1E.003 **HIGH-RESOLUTION PIEZOELECTRIC MEMS SCANNER FULLY INTEGRATED WITH FOCUS-TUNING AND DRIVING ACTUATORS** 474
Shunsuke Inagaki, Yuki Okamoto, Akio Higo, and Yoshio Mita
University of Tokyo, JAPAN

10:30 - 10:45

W1E.004 **WAVEGUIDE GRATING COLOR REFLECTOR USING GERMANIUM TELLURIDE** 478
Mohsen Jafari[1], L. Jay Guo[1], and Mina Rais-Zadeh[1,2]
[1]*University of Michigan, USA and* [2]*NASA JPL, USA*

wednesday

10:45 - 11:15 | **Break and Exhibit Inspection**



Panorama of modern Government buildings over the Spree river in evening dusk.

Session W2A - Cell on a Chip I

Session Co-Chairs: Olivier Francais, *ESIEE PARIS, FRANCE*
and Srinivas Tadigadapa, *Northeastern University, USA*

Convention Hall I - A/B

wednesday

11:15 - 11:30

W2A.001 **PAIRING AND ELECTROFUSION OF LIPOSOMES IN A DYNAMIC MICROARRAY DEVICE** 482
Keisuke Sugahara, Sho Takamori, and Shoji Takeuchi
University of Tokyo, JAPAN

11:30 - 11:45

W2A.002 **THERAPEUTIC AND SIDE EFFECTS MODELING OF ELECTROLYTIC CANCER ABLATION THERAPY USING ORGAN-ON-A-CHIP** 484
Moon chul Park[1], Jong man Yoo[2], and Albert Kim[1]
[1]*Temple University, USA and* [2]*Cha University, KOREA*

11:45 - 12:00

W2A.003 **A MICROFLUIDIC SYSTEM COMBINING VALVE AUTOMATION AND SPHEROID CULTURES TO CHARACTERIZE HEPATIC GLUCOSE METABOLISM DURING HORMONAL STIMULATION** 488
Diana F. Cedillo-Alcántar[1], Gulnaz Stybayeva[1], José M. de Hoyos-Vega[1], Yong Duk Han[2], Jonghoon Choi[2], José L. García-Cordero[1], and Alexander Revzin[2]
[1]*Centro de Investigación y de Estudios Avanzados del IPN, MEXICO and* [2]*Mayo Clinic, USA*

12:00 - 12:15

W2A.004 **IN-DROPLET CELL SEPARATION BASED ON LATERAL DIELECTROPHORESIS RESPONSE** 492
Can Huang, Song-I Han, and Arum Han
Texas A&M Univeristy, USA

12:15 - 12:45

W2A.005 **INVITED SPEAKER**
UNLOCKING BIOMEDICAL DISCOVERIES THROUGH VOLUME PRODUCTION OF NANOPATTERNED MATERIALS 496
Neil Convery, John Stormonth-Darling, and **Nikolaj Gadegaard**
University of Glasgow, UK

Session W2B - Accelerometers and Gyros II

Session Co-Chairs: Peng Shao, *NXP Semiconductors, USA*
and Shuji Tanaka, *Tohoku University, JAPAN*

Convention Hall I - C

11:15 - 11:30

W2B.001 **A MEMS GRAVIMETER QUALIFIED FOR EARTH TIDES MEASUREMENT** 499
ShiHao Tang, HuaFeng Liu, ShiTao Yan, XiaoChao Xu, WenJie Wu, and LiangCheng Tu
Huazhong University of Science and Technology, CHINA

11:30 - 11:45

W2B.002 **A PIEZOELECTRIC RESONANT ACCELEROMETER FOR ABOVE 140DB LINEAR DYNAMIC RANGE HIGH-G APPLICATIONS** 503
Seungyong Shin, Anosh D. Daruwalla, Minxiang Gong, Haoran Wen, and Farrokh Ayazi
Georgia Institute of Technology, USA

11:45 - 12:00

W2B.003 **GRATING-BASED ACCELERATION SENSORS WITH OPTICAL INTERFEROMETRIC READOUT AND CLOSED-LOOP CONTROL** 507
Randall P. Williams[1], Neal A. Hall[1], and Brad D. Avenson[2]
[1]*University of Texas, Austin, USA and* [2]*Silicon Audio, Inc., USA*

12:00 - 12:15

W2B.004 **EARTH TREMORS OBSERVATION BY A DIAMAGNETIC LEVITATION BASED INERTIAL SENSOR** 511
Qiu Wang, Xiaofang Ren, Shitao Yan, Shimin Jiao, Xiaochao Xu, Xiaozhou Lei, Qiangwei Xu, Chenyuan Hu, Zhilin Xu, Huafeng Liu, Pengshun Luo, and Liangcheng Tu
Huazhong University of Science and Technology, CHINA

12:15 - 12:30

W2B.005 **INTEGRATION OF A COMPLIANT THERMAL ACTUATOR FOR UNLATCHING IN A MEMS LATCH ACCELEROMETER** 515
Murugappan Ramanathan and Rudra Pratap
Indian Institute of Science

12:30 - 12:45

W2B.006 **AN ELECTROCHEMICAL MICROSEISMOMETER BASED ON A NEW ELECTROLYTE SYSTEM TO IMPROVE THE LOW-FREQUENCY PERFORMANCES** 519
Bowen Liu[1,2], Junbo Wang[1,2], Deyong Chen[1,2], Jian Chen[1,2], Chao Xu[1,2], Wenjie Qi[1,2], Xichen Zheng[1,2], Hua Wei[1], and Guoqing Zhang[1]
[1]*Chinese Academy of Sciences (CAS), CHINA and*
[2]*University of Chinese Academy of Sciences, CHINA*

Session W2C - RF MEMS II

Session Co-Chairs: Nuria Barniol, *Universitat Autonoma de Barcelona, SPAIN* and Amit Lal, *Cornell University, USA*

Convention Hall I - D

wednesday

11:15 - 11:45

W2C.001 **INVITED SPEAKER**
3G – 4G – 5G: HOW BAW FILTER TECHNOLOGY ENABLES A CONNECTED WORLD 523
Robert Aigner and Gernot Fattinger
Qorvo Inc., USA

11:45 - 12:00

W2C.003 **AN ULTRA-HIGH-QUALITY FACTOR SILICON DISK RESONATOR** 527
Guillermo Sobreviela, Xudong Zhou, Chun Zhao, Milind Pandit, and Ashwin A. Seshia
University of Cambridge, UK

12:00 - 12:15

W2C.004 **A GENERIC TIN-C PROCESS FOR CMOS FEOL/BEOL-EMBEDDED VERTICALLY-COUPLED CAPACITIVE AND PIEZORESISTIVE RESONATORS** 531
Chao-Yu Chen[1], Anurag A. Zope[1], Ming-Huang Li[2], and Sheng-Shian Li[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*University of Illinois Urbana-Champaign, USA*

12:15 - 12:30

W2C.005 **FDSOI ON LITHIUM NIOBATE USING Al_2O_3 WAFER-BONDING FOR ACOUSTOELECTRIC RF MICRODEVICES** 535
Siddhartha Ghosh
Massachusetts Institute of Technology, USA

12:30 - 12:45

W2C.006 **SUPER HIGH FREQUENCY LATERAL-FIELD-EXCITED ALUMINUM NITRIDE CROSS-SECTIONAL LAMÉ MODE RESONATORS** 539
Guofeng Chen and Matteo Rinaldi
Northeastern University, USA

Session W2D - Tactile Sensors II

Session Co-Chairs: Jungwook Choi, *Yeungnam University, KOREA*
and Amy Duwel, *Draper, Inc., USA*

Hall Europa

11:15 - 11:30

W2D.001 **ELECTRONIC SKIN-INTEGRATED SOFT ROBOTIC HAND** 543
Takafumi Yamaguchi, Takayuki Arie, Seiji Akita, and Kuniharu Takei
Osaka Prefecture University, JAPAN

11:30 - 11:45

W2D.002 **TACTILE SENSING FROM BACKSIDE OF FLEXIBLE PRINTED CIRCUIT USING LSI-INTEGRATED SENSOR WITH ELASTIC DOME STRUCTURE** 547
Tatsuki Teranishi, Hideki Hirano, and Shuji Tanaka
Tohoku University, JAPAN

11:45 - 12:00

W2D.003 **A FLEXIBLE TACTILE SENSOR TO DETECT STIFFNESS DISTRIBUTION WITHOUT MEASURING DISPLACEMENT** 551
Tatsuho Nagatomo and Norihisa Miki
Keio University, JAPAN

12:00 - 12:15

W2D.004 **SELF-POWERED TRANSPARENT STRETCHABLE 3D MOTION SENSOR** 554
Hang Guo, Xuexian Chen, Liming Miao, Haobin Wang, Ji Wan, and Haixia Zhang
Peking University, CHINA

12:15 - 12:30

W2D.005 **A BLOOD PRESSURE MONITORING DEVICE WITH TACTILE AND TENSION SENSORS ASSISTED BY MACHINE LEARNING TECHNIQUE** 558
Kuan-Hua Huang, Fu Tan, Tzung-Dau Wang, and Yao-Joe Yang
National Taiwan University, TAIWAN

12:30 - 12:45

W2D.006 **TACTILE SENSING SYSTEM MODULE WITH MULTIPLE CMOS-MEMS INTEGRATED SENSORS ON 16 MBPS HIGH SPEED SHARED SERIAL BUS LINE** 562
Chenzhong Shao[1], Hideki Hirano[1], Munetaka Nomoto[1], Hiroshi Miyaguchi[1], Takahiro Nakayama[2], Yoshiyuki Hata[3], Motohiro Fujiyoshi[3], Masanori Muroyama[1], and Shuji Tanaka[1]
[1]*Tohoku University, JAPAN,* [2]*Toyota Motor Corporation, JAPAN, and* [3]*Toyota Central R&D Labs., Inc., JAPAN*

wednesday

Session W2E - Optical Biosensors

Session Co-Chairs: Karl Bohringer, *University of Washington, USA*
and Long Que, *Iowa State University, USA*

Room 1 (upstairs)

11:15 - 11:30

W2E.001 **RAPID PATHOGEN DETECTION AND ANTIMICROBIAL SUSCEPTIBILITY ASSESSMENT FROM URINE SAMPLES VIA AMPLIFICATION-FREE DETECTION OF RIBOSOMAL RNA OF SINGLE BACTERIA** 566
Aniruddha M. Kaushik, Kuangwen Hsieh, Thomas DiSorbo, and Tza-Huei Wang
Johns Hopkins University, USA

11:30 - 11:45

W2E.002 **CHIP-SCALE WHISPERING GALLERY MODE GLASS SHELL RESONATORS FOR CALORIMETRIC BIOSENSING APPLICATIONS** 570
Vedant P. Sumaria, Sandeep Inampudi, and Srinivas Tadigadapa
Northeastern University, USA

11:45 - 12:15

W2E.003 **INVITED SPEAKER**
INTEGRATING MICROSYSTEMS WITH METAMATERIALS TOWARDS METADEVICES 574
Xiaoguang Zhao, Aobo Li, Guangwu Duan, Chunxu Chen, and **Xin Zhang**
Boston University, USA

12:15 - 12:30

W2E.005 **DETECTION OF AUTOANTIBODIES FOR TYPE 1 DIABETES USING LABEL-FREE OPTICAL SENSORS** 578
Subin Mao, Silu Feng, and Long Que
Iowa State University, USA

12:30 - 12:45

W2E.006 **DNA APTAMER-LINKED STRUCTURAL-COLOR HYDROGEL FOR REPEATABLE BIOCHEMICAL SENSING** 582
Tomoki Hayashi[1], Masahiro Takinoue[2], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*Tokyo Institute of Technology, JAPAN*

12:45 - 14:30	**Lunch on Own in Exhibit Hall**

13:30 - 14:30	**Industrial Stage Session 3** (Exhibit Hall) **Chair:** Udo-Martin Gomez, *Robert Bosch GmbH, GERMANY* **3a** Helbling Technik Bern AG, SWITZERLAND **3b** Polytec GmbH, GERMANY **3c** Accurion GmbH, GERMANY **3d** Lam Research Corporation, USA
14:30 - 16:30	**Poster Session W3P and Exhibit Inspection** (refreshments will be served) Poster presentations are listed by topic category with their assigned number starting on page 51.

Kreuzberg neighborhood

Session W4B - Accelerometers and Gyros III

Session Co-Chairs: Farrokh Ayazi, *Georgia Institute of Technology, USA*
and Philippe Robert, *CEA-LETI, FRANCE*

Convention Hall I - C

wednesday

16:30 - 16:45

W4B.001 **A NOVEL NONLINEARITY REDUCTION METHOD IN DISK RESONATOR GYROSCOPES BASED ON THE VIBRATION AMPLIFIER EFFECT** 586

Qingsong Li, Jiangkun Sun, Yi Xu, Peng Wang, Xin Zhou, Kuo Lu, Xuezhong Wu, and Dingbang Xiao
National University of Defense Technology, CHINA

16:45 - 17:00

W4B.002 **SHAPE MEMORY FOIL-BASED ACTIVE MICRO DAMPING FOR PORTABLE APPLICATIONS** 590

Kiran Jacob[1], Shahabeddin Ahmadi[2], Frank Wendler[2], Shuichi Miyazaki[3], and Manfred Kohl[1]
[1]*Karlsruhe Institute of Technology (KIT), GERMANY,*
[2]*Friedrich-Alexander-Universität Erlangen-Nürnberg, GERMANY, and*
[3]*University of Tsukuba, JAPAN*

17:00 - 17:15

W4B.003 **AGC-LESS OPERATION OF HIGH-STABILITY LISSAJOUS FREQUENCY-MODULATED MEMS GYROSCOPES** 594

Elia Bordiga, Marco Bestetti, and Giacomo Langfelder
Politecnico di Milano, ITALY

17:15 - 17:30

W4B.004 **A BACKGROUND CALIBRATION TECHNIQUE FOR I/Q PHASE MISMATCH IN MEMS VIBRATORY GYROSCOPE** 598

Yoshikazu Furuta[1], Ippei Takahashi[1], Nobuaki Matsudaira[1], Chao Chen[1], Takashi Katsuno[1], Tomohiro Nezuka[1], and Yong Ping Xu[2]
[1]*DENSO Corporation, JAPAN and* [2]*National University of Singapore, SINGAPORE*

17:30 - 17:45

W4B.005 **SMALL SIZE AND HIGHLY SENSITIVE DIFFERENTIAL MEMS ACCELEROMETER BASED ON DOUBLE-ENDED TUNING FORK RESONATORS** 602

Eurico E. Moreira[1,2], Burkhard Kuhlmann[3], João Gaspar[2], and Luis A. Rocha[1,2]
[1]*University of Minho, PORTUGAL,* [2]*International and Iberian Nanotechnology Laboratory (INL), PORTUGAL, and*
[3]*Robert Bosch GmbH, GERMANY*

End of Session W4B -Accelerometers and Gyros III

Session W4C - Cell/Bio Sensing

Session Co-Chairs: Peter Hesketh, *Georgia Institute of Technology, USA*
and Andreu Llobera, *Carl Zeiss Vision, GERMANY*

Convention Hall I - D

16:30 - 16:45

W4C.001 **LEUKEMIA-ON-CHIP - ELECTRICAL IMPEDANCE SPECTROSCOPY AS AN ONLINE READOUT TO INVESTIGATE DRUG-CANCER INTERACTION** 606
Furkan Gökçe, Paolo S. Ravaynia, Alicia J. Kaestli, Mario M. Modena, Andreas Hierlemann, and Kasper Renggli
ETH Zürich, SWITZERLAND

16:45 - 17:00

W4C.002 **A COMBINED PROCESS OF SILICON SHADOW MASKING AND INKJET PRINTING (SSMP) FOR GRAPHENE OXIDE AND REDUCED GRAPHENE OXIDE MICROSTRUCTURES FOR SELECTIVE CELL CULTURING APPLICATIONS** 609
Che-Hao Kang, Yu-Min Fu, Ching Chuan Kao, Jia-Wei Yang, Ming-Liang Tseng, Zih-Yu Yu, Yu-Ting Cheng, Guan-Yu Chen, Pu-Wei Wu, and Chung-Yu Wu
National Chiao Tung University, TAIWAN

17:00 - 17:15

W4C.003 **NON-ENZYMATIC ELECTROCHEMICAL DETECTION OF GLUTAMATE USING TEMPLATED POLYMER-BASED TARGET RECEPTORS** 613
Habib M.N. Ahmad, Bo Si, Gaurab Dutta, John R. Csoros, William Rudolph Seitz, and Edward Song
University of New Hampshire, USA

17:15 - 17:30

W4C.004 **LABEL-FREE REAL-TIME IMAGING OF EXTRACELLULAR LACTATE FROM A HIPPOCAMPAL SLICE BASED ON CHARGE-TRANSFER-TYPE POTENTIOMETRIC REDOX SENSOR ARRAYS** 617
Hideo Doi[1], Tomoko Horio[1], Eiji Shigetomi[2], Youichi Shinozaki[2], You-Na Lee[1], Tatsuya Yoshimi[1], Tatsuya Iwata[1], Toshihiko Noda[1], Kazuhiro Takahashi[1], Toshiaki Hattori[1], Schuichi Koizumi[2], and Kazuaki Sawada[1]
[1] *Toyohashi University of Technology, JAPAN and*
[2] *University of Yamanashi, JAPAN*

17:30 - 17:45

W4C.005 **RAPID PURIFICATION, ENRICHMENT, AND DETECTION OF BIOMOLECULES USING BULK ACOUSTIC WAVE RESONATORS** 621
Weiwei Cui[1], Luye Mu[2], Wei Pang[1], Mark Reed[2], and Xuexin Duan[1]
[1] *Tianjin University, CHINA and* [2] *Yale University, USA*

17:45 - 18:00

W4C.006 **DUAL-FUNCTION INTRAVASCULAR CATHETER FOR ATHEROSCLEROSIS DIAGNOSTICS** 625
Yuan Luo[1], Parinaz Abiri[2], Rene R.S. Packard[2], Tzung K. Hsiai[2], and Yu-Chong Tai[1]
[1] *California Institute of Technology, USA and*
[2] *University of California, Los Angeles, USA*

Session W4D - IR Detectors

Session Co-Chairs: Bernhard Jakoby, *Johannes Kepler University Linz, AUSTRIA* and Eric Yeatman, *Imperial College London, UK*

Hall Europa

wednesday

16:30 - 16:45

W4D.001 **INFRARED DETECTOR USING ORGANIC NANO-PILLAR ARRAYS** 629

Yoshiharu Ajiki[1], Tetsuo Kan[2], Masayuki Yahiro[3], Akiko Hamada[3], Junji Adachi[3], and Chihaya Adachi[3]

[1]*Olympus Corporation, JAPAN,* [2]*University of Electro-Communications, JAPAN, and* [3]*Kyushu University, JAPAN*

16:45 - 17:00

W4D.002 **INFRARED PHOTODETECTOR WITH COPPER RESONATOR IN SILICON NANOHOLE ARRAY** 633

Shun Yasunaga[1], Tetsuo Kan[2], Hidetoshi Takahashi[1], Tomoyuki Takahata[1], and Isao Shimoyama[1]

[1]*University of Tokyo, JAPAN and* [2]*University of Electro-Communications, JAPAN*

17:00 - 17:15

W4D.003 **THRESHOLD-TRIGGERED MEMS-CMOS INFRARED RESONANT DETECTOR WITH NEAR-ZERO STANDBY POWER CONSUMPTION** 637

Sila Deniz Calisgan, Sungho Kang, Vageeswar Rajaram, Zhenyun Qian, and Matteo Rinaldi

Northeastern University, USA

17:15 - 17:30

W4D.004 **MICROMACHINED UNCOOLED $Si_XGe_YO_{1-X-Y}$ MICROBOLOMETER INTEGRATED METASURFACE FOR UNCOOLED INFRARED DETECTION** 641

Amjed Abdullah[1], Akshay Koppula[1], Omar Alkorjia[1], Cameron Warder[1], Tao Liu[2], Edward Kinzel[2], and Mahmoud Almasri[1]

[1]*University of Missouri, USA and*
[2]*Missouri University of Science and Technology, USA*

17:30 - 17:45

W4D.005 **NANOPLASMONICS ENHANCED BROADBAND ULTRA-SENSITIVE MID-IR SENSOR ARRAY INTEGRATED WITH MICROFLUIDICS** 645

Zhihao Ren, Jingxuan Wei, Dihan Hasan, Bowei Dong, Guangya Zhou and Chengkuo Lee

National University of Singapore, SINGAPORE

17:45 - 18:00

W4D.006 **3-D THERMAL RADIATION SENSORS ON OPTICAL FIBER TIPS FABRICATED USING ULTRASHORT LASER PULSES** 649

Jonathan W. Smith[1], Joe S. Suelzer[2], Nicholas G. Usechak[2], Vincent P. Tondiglia[2], and Hengky Chandrahalim[1]

[1]*US Air Force Institute of Technology, USA and*
[2]*Air Force Research Laboratory, USA*

Session W4E - Mixed Session

Session Co-Chairs: Franz Laermer, *Robert Bosch GmbH, GERMANY*
and Dinesh Pamunuwa, *University of Bristol, UK*

Room 1 (upstairs)

16:30 - 17:00

W4E.001 **INVITED SPEAKER**
HIGH PERFORMANCE PIEZOELECTRIC AIN MEMS RESONATORS FOR LIQUID SENSING AND BEYOND – THE POTENTIAL OF PIEZOMEMS 653
Ulrich Schmid and Michael Schneider
Vienna University of Technology, AUSTRIA

17:00 - 17:15

W4E.003 **AIN PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCER ARRAY MONOLITHICALLY FABRICATED ON TOP OF PRE-PROCESSED CMOS SUBSTRATES** 655
Eyglis Ledesma[1], Ivan Zamora[1], Francesc Torres[1], Arantxa Uranga[1], Vassil Tzanov[1], Nuria Barniol[1], Eloi Marigo[2], and Mohan Soundara-Pandian[2]
[1]*Electronics Eng. Dept, Universitat Autonoma de Barcelona, SPAIN and*
[2]*Silterra Malaysia Sdn. Bhd, MALAYSIA*

17:15 - 17:30

W4E.004 **A PIEZORESISTIVE MEMS BAROMETER WITH THERMOMECANICAL STRESS REJECTION** 659
Enri Duqi, Lorenzo Baldo, Mikel Azpeitia Urquia, and Giorgio Allegato
ST Microelectronics, ITALY

17:30 - 17:45

W4E.005 **NOVEL HINGE MECHANISM FOR VACUUM TRANSDUCTION HIGH PERFORMANCE CAPACITIVE MEMS MICROPHONES** 663
Samer Dagher[1,2], Carine Ladner[1], Stéphane Durand[2], and Loic Joet[1]
[1]*University of Grenoble, Aples CEA-Leti, FRANCE and*
[2]*LAUM UMR-CNRS, FRANCE*

End of Session W4E -Mixed Session

18:00	**Adjourn for the Day**
19:00 - 22:00	**Transducers/EUROSENSORS Conference Banquet** Convention Hall I-A/B

transducers 2019
eurosensors xxxii

THURSDAY PROGRAM

27 JUNE

08:30 - 09:15	**Plenary Presentation IV - EUROSENSORS 2018 Fellow** Session Chair: Jürgen Brugger, *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND* Th1A.P04 **DIAMOND: A NEW CHEMICAL SENSOR'S BEST FRIEND?** . . . . . 667 **Emmanuel Scorsone** *CEA-LIST, FRANCE*
09:15 - 09:30	**EUROSENSORS 2019 Fellow Announcement**
09:30 - 09:45	**Transition**

Bode Museum on Museum Island

thursday

Session Th1A - Flexible Substrate Sensors

Session Co-Chairs: Yao-Joe Yang, *National Taiwan University, TAIWAN*
and Alice Zhang, *Peking University, CHINA*

Convention Hall I - A/B

09:45 - 10:00

Th1A.001 **A PRINTED FLEXIBLE SENSOR BASED SILK-FIBROIN FOR DISTINGUISHING THE EXISTING STATES OF WATER: LIQUID OR GASEOUS?** 673
Danliang Wen, Xin Liu, Haitao Deng, Deheng Sun, and Xiaosheng Zhang
University of Electronic Science and Technology of China, CHINA

10:00 - 10:15

Th1A.002 **INTEGRATING METAMATERIAL AND MICROCHANNEL ONTO FLEXIBLE PAPER AS MINIATURIZED BIOCHEMICAL SENSING PLATFORM** 677
Hong Zhou[1], Cheng Yang[2], Donglin Hu[1], Dongxiao Li[1], Xindan Hui[1], Yongjie Yi[1], and Xiaojing Mu[1]
[1]*Chongqing University, CHINA and*
[2]*Third Military Medical University, CHINA*

10:15 - 10:30

Th1A.003 **TWO-DIMENSIONAL TUNGSTEN DISELENIDES INTEGRATED ON PAPER SUBSTRATE FOR HIGHLY FLEXIBLE AND SENSITIVE GAS SENSOR** 681
Woo Sung Lee and Jungwook Choi
Yeungnam University, KOREA

10:30 - 10:45

Th1A.004 **DIGITAL MICROFABRICATION ON PAPER AND CLOTH FOR HEAVY METAL DETECTION AND REMEDIATION** 685
Arshya Bamshad and Hyoung Jin Cho
University of Central Florida, USA

Berlin Cathedral at sunrise – German Berliner Dom on Museum Island

Session Th1B - Water Sensors

Session Co-Chairs: Isabelle Dufour, *University of Bordeaux, FRANCE*
and Cosmin Roman, *ETH Zürich, SWITZERLAND*

Convention Hall I - C

09:45 - 10:00

Th1B.001 **A NOVEL FLEXIBLE MICROWAVE SENSOR CHIP FOR SIMULTANEOUS MONITORING OF OIL ACIDITY AND WATER CONTENT** 689
Xiecheng Tang[1,2], Qiannan Xue[1], Haitao Liu[2], and Xuexin Duan[1]
[1]*Tianjin University, CHINA and* [2]*Civil Aviation University of China, CHINA*

10:00 - 10:15

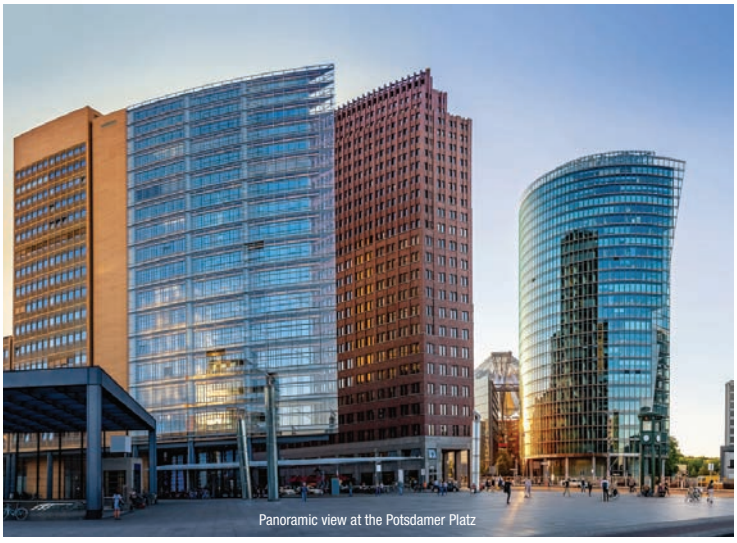
Th1B.002 **DESIGN OF CHEMICAL SENSOR COATINGS BASED ON BLENDS OF A SINGLE POLYMER-PLASTICIZER PAIR FOR DETECTION OF SINGLE OR MULTI-ANALYTE AQUEOUS SOLUTIONS** 693
Nicholas Post[1], Kartick Sothivelr[1], Florian Bender[1], Fabien Josse[1], Antonio Ricco[2], and Edwin Yaz[1]
[1]*Marquette University, USA and* [2]*Stanford University, USA*

10:15 - 10:30

Th1B.003 **DRAGONFLY-LIKE MICRO SAMPLING DEVICE FOR EXTRACTING NANO-LITER SAMPLE FROM PLANTS** 697
Panpan Gao[1], Toshihiro Kasama[1], Maia Godonoga[1], Yoshishige Endo[1], Tetsushi Koide[2], Atsushi Ogawa[3], and Ryo Miyake[1]
[1]*University of Tokyo, JAPAN,* [2]*Hiroshima University, JAPAN, and* [3]*Akita Prefectural University, JAPAN*

10:30 - 10:45

Th1B.004 **SMART BIOSENSOR FOR RAPID AND SIMULTANEOUS DETECTION OF WATERBORNE PATHOGENS IN TAP WATER** 701
Sura A. Muhsin[1], Muthana Al-Amidie[1], Zahar Mlaji[1], Zhenyu Shen[1], Amjed Abdullah[1], Jiayu Liu[1], Ferris Dweik[1], Ibrahem Jasim[1], Majed El-Dweik[2], Shuping Zhang[1], and Mahmoud Almasri[1]
[1]*University of Missouri, USA and* [2]*Lincoln University, USA*



Panoramic view at the Potsdamer Platz

Session Th1C - RF MEMS III

Session Co-Chairs: Sarah Bedair, *US Army Research Laboratory, USA*
and Gabriele Schrag, *Technical University of Munich, GERMANY*

Convention Hall I - D

09:45 - 10:00

Th1C.001 **A PLANAR SINGLE-ACTUATOR BI-STABLE SWITCH BASED ON LATCH-LOCK MECHNISM** 705
Yang Gao[1], Toshiki Ema[2], Zeyuan Cao[3], Sheng Ni[1], Elena Y.L. Chan[1], Osamu Tabata[2], Toshiyuki Tsuchiya[2], Xiaohong Wang[3], and Man Wong[1]
[1]*Hong Kong University of Science and Technology, HONG KONG,* [2]*Kyoto Univeristy, JAPAN, and* [3]*Tsinghua University, CHINA*

10:00 - 10:15

Th1C.002 **PARALLEL LOGICS USING MULTIMODE EXCITATION OF A SINGLE MEMS RESONATOR** 709
Nizar Jaber[1,2], Saad Ilyas[2], and Mohammad Younis[2]
[1]*Purdue University, USA and* [2]*King Abdullah University of Science and Technology (KAUST), SAUDI ARABIA*

10:15 - 10:30

Th1C.003 **MECHANICALLY MODULATED MICROWAVE CIRCULATOR** 713
Mustafa Mert Torunbalci[1], Suresh Sridaran[2], Richard C. Ruby[2], and Sunil A. Bhave[1]
[1]*Purdue University, USA and* [2]*Broadcom Ltd., USA*

10:30 - 10:45

Th1C.004 **SWITCHABLE MECHANICAL RESONANCE INDUCED BY HYSTERETIC PIEZOELECTRICITY IN FERROELECTRIC CAPACITORS** 717
Yanbo He[1], Bichoy Bahr[2], Mengwei Si[1], Peide Ye[1], and Dana Weinstein[1]
[1]*Purdue University, USA and* [2]*Texas Instruments, USA*

Berlin Concert Hall at famous Gendarmenmarkt Square

Session Th1D - Image Sensing

Session Co-Chairs: Alissa Fitzgerald, *A.M. Fitzgerald & Associates, LLC, USA* and Xiaosheng Zhang, *University of Electronic Science and Technology of China, CHINA*

Hall Europa

09:45 - 10:00

Th1D.001 **A NOVEL MICROFLUIDIC PLATFORM FOR LABEL-FREE 3D IMAGING OF BIOLOGICAL CELLS** 721

Rahul Singh Kotesa[1], Saransh Arora[2], G.K. Ananthasuresh[1], and Prosenjit Sen[1]

[1]*Indian Institute of Science, INDIA and*
[2]*Birla Institute of Technology and Science, Pilani, INDIA*

10:00 - 10:15

Th1D.002 **HIGH-COLOR-PURITY MICROFLUIDIC QUANTUM DOTS LIGHT-EMITTING DIODES USING THE ELECTROLUMINESCENCE OF THE LIQUID ORGANIC SEMICONDUCTOR BACKLIGHT** 724

Masahiro Kawamura[1], Hiroyuki Kuwae[1], Takumi Kamibayashi[1], Juro Oshima[2], Takashi Kasahara[3], Shuichi Shoji[1], and Jun Mizuno[4]

[1]*Waseda University, JAPAN,* [2]*Nissan Chemical Corporation, JAPAN,* [3]*Hosei University, JAPAN, and* [4]*Research Organization for Nano and Life Innovation, JAPAN*

10:15 - 10:30

Th1D.003 **LIGHT DRIVING OF ON-CHIP MICRO-GEL ACTUATOR TOWARDS MASSIVE INTEGRATION** 728

Yuha Koike[1], Yoshiyuki Yokoyama[2], and Takeshi Hayakawa[1]

[1]*Chuo University, JAPAN and* [2]*Toyama Industrial Technology Research and Development Center, JAPAN*

10:30 - 10:45

Th1D.004 **HYDROGEN ION MICROSCOPE USING 2 µM PITCH PH IMAGE SENSOR AND ANALYSIS OF MOUSE HIPPOCAMPAL SLICE** 732

Chinatsu Kawakami[1], You-Na Lee[1], Hideo Doi[1], Tomoko Horio[1], Yasuyuki Kimura[1], Eiji Shigetomi[2], Youichi Shinozaki[2], Toshihiko Noda[1], Tatsuya Iwata[1], Kazuhiro Takahashi[1], Schuichi Koizumi[2], and Kazuaki Sawada[1]

[1]*Toyohashi University of Technology, JAPAN and*
[2]*University of Yamanashi, JAPAN*

10:45 - 11:15	**Break**

Session Th2A - Cell on a Chip II

Session Co-Chairs: Victor J. Cadarso, *Monash University, AUSTRALIA*
and Andreas Hierlemann, *ETH Zürich, SWITZERLAND*

Convention Hall I - A/B

11:15 - 11:30

Th2A.001 ***IN VITRO* DEVELOPMENT OF THE EMBRYO IN A MICROFLUIDIC DEVICE FOR AUTOMATIC EMBRYO TRAPPING AND CO-CULTURE WITH ENDOMETRIAL CELLS** 736
Shalaka Bhosale[1], Mushou Chen[2], and Cheng-Hsien Liu[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*Chang Gung Medical Foundation, TAIWAN*

11:30- 11:45

Th2A.002 **ON-CHIP PRE-TREATMENT OF BIOLOGICAL SAMPLES FOR THE ISOLATION OF ADIPOSE STEM CELLS (ASCs)** 740
Marion Valette[1,2,3], Mathias Bouguelmouna[3], Mélanie Mariotte[1,5], Rémi Courson[1], Marie-Charline Blatché[1], Amandine Girousse[4], Coralie Sengenès[4], Karine Reybier[2,3], and Anne-Marie Gué[1,3]
[1]*LAAS-CNRS, FRANCE,* [2]*PharmadeV, FRANCE,* [3]*Université Toulouse III Paul Sabatier, FRANCE,* [4]*Stromalab, FRANCE, and* [5]*Univeristy of Limoges, FRANCE*

11:45 - 12:00

Th2A.003 **AN INTEGRATED DEVICE FOR MONITORING SINGLE CELL METABOLISM** 744
Bocheng Yu, Yuting Wu, Peng Yu, Dong Huang, and Zihong Li
Peking University, CHINA

12:00 - 12:15

Th2A.004 **ASPIRATION AND MASS MEASUREMENT OF MICROPARTICLES AND UNICELLULAR ORGANISMS VIA MICROPIPETTE RESONATORS** 748
Juhee Ko[1], Donghyuk Lee[2], Bong Jae Lee[1], Taewook Kang[3], Sangkeun Kauh[4], and Jungchul Lee[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), KOREA,* [2]*Samsung Electronics, KOREA,* [3]*Sogang University, KOREA, and* [4]*Seoul National University, KOREA*

12:15 - 12:30

Th2A.005 **ECM-BASED STRETCHABLE MICROFLUIDIC SYSTEM FOR *IN VITRO* 3D TISSUE CULTURE** 752
Azusa Shimizu[1], Wei Huang Goh[2], Michinao Hashimoto[2], Shigenori Miura[3], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN,* [2]*Singapore University of Technology and Design, SINGAPORE, and* [3]*University of Tokyo, JAPAN*

12:30 - 12:45

Th2A.006 **STUDIES OF NEUROSPHERES CULTURED USING ADULT HIPPOCAMPAL PROGENITOR CELLS UNDER OFF-CHIP MAGNETIC STIMULATION** 756
Renyuan Yang, Emily Kozik, Bhavika Patel, David Jiles, Donald Sakaguchi, and Long Que
Iowa State University, USA

Session Th2B - Gas Sensors

Session Co-Chairs: Isabelle Dufour, *University of Bordeaux, FRANCE*
and Wouter Olthuis, *University of Twente, THE NETHERLANDS*

Convention Hall I - C

11:15 - 11:45

Th2B.001 **INVITED SPEAKER**
SMART ENVIRONMENTAL SENSOR SYSTEMS FOR A DIGITAL AND SUSTAINABLE WORLD . . . . . **N/A**
Markus Graf
Sensirion Automotive Solutions AG, SWITZERLAND

11:45 - 12:00

Th2B.003 **RESISTANCE-TYPE HUMIDITY SENSOR USING CNTS SENSING MATERIAL WITH Al_2O_3 CONFORMAL COATING FOR ENHANCED SENSITIVITY** **761**
Chien-Ya Hung[1], Wei-Lun Sung[2], Sih-Chieh Chen[3], and Weileun Fang[1]
[1]*National Tsing Hua University, TAIWAN,* [2]*imec TW, TAIWAN, and* [3]*Industrial Technology Research Institute, TAIWAN*

12:00 - 12:15

Th2B.004 **FLEXIBLE GAS SENSOR ARRAY BASED ON MATRIX OF MOLECULARLY IMPRINTED MATERIALS AND FULL PRINTING PROCESS** **765**
Lingpu Ge, Fumihiro Sassa, and Kenshi Hayashi
Kyushu University, JAPAN

12:15 - 12:30

Th2B.005 **A SENSITIVE RESONANT GAS SENSOR BASED ON MULTIMODE EXCITATION OF A BUCKLED BEAM** **769**
Amal Hajja[1], Nizar Jaber[1,2], Nouha Alcheikh[1], and Mohammad I. Younis[1]
[1]*King Abdullah University of Science and Technology (KAUST), SAUDI ARABIA and* [2]*Purdue University*

12:30 - 12:45

Th2B.006 **A LIGHT-ACTIVATED MICROPOWER GAS SENSOR FOR THE DETECTION OF NO_2 DOWN TO THE PARTS PER BILLION (PPB) RANGE** **773**
Olga Casals[1], Nicolai Markiewicz[1,2], Cristian Fabrega[1], Isabel Gracia[3], Carles Cane[3], Hutomo Suryo Wasisto[2], Andreas Waag[2], and J. Daniel Prades[1]
[1]*Universitat de Barcelona, SPAIN,* [2]*Technical University of Braunschweig, GERMANY, and* [3]*IMB-CNM CSIC, SPAIN*

Session Th2C - Energy & Power MEMS II

Session Co-Chairs: Peter Woias, *University of Freiburg, GERMANY*
and Eric Yeatman, *Imperial College London, UK*

Convention Hall I - D

11:15 - 11:30

Th2C.001 **HIGH MASS-LOADING AND MECHANICAL STRENGTH SUPERCAPACITOR BY GRAPHENE/CARBON FIBER COMPOSITES** 777
Yuanyuan Huang[1,2], Caiwei Shen[1,3], Zirong Tang[2], Sunxiang Zheng[1], Tielin Shi[2], and Liwei Lin[1]
[1]*University of California, Berkeley, USA,*
[2]*Huazhong University, CHINA and*
[3]*University of Massachussets Dartmouth, USA*

11:30 - 11:45

Th2C.002 **A NOVEL ANODE IN HIGH-PERFORMANCE LITHIUM-ION BATTERY BASED ON ADVANCED NANOMATERIALS AND NANOFABRICATION TECHNOLOGY** 781
Bingmeng Hu, Xinyan Jia, and Xiaohong Wang
Tsinghua University, CHINA

11:45 - 12:15

Th2C.003 **INVITED SPEAKER**
PIEZOELECTRIC PZT THIN FILMS: DEPOSITION, EVALUATION AND THEIR APPLICATIONS 785
Isaku Kanno
Kobe University, JAPAN

12:15 - 12:30

Th2C.005 **INTEGRATED FABRICATION OF SERIALLY-CONNECTED HIGH VOLTAGE MICROBATTERIES VIA MULTILAYER ELECTRODEPOSITION** 789
Michael Synodis, James Pikul, Sue Ann Bidstrup Allen, and Mark Allen
University of Pennsylvania, USA

12:30 - 12:45

Th2C.006 **MEMS MASS FLOW CONTROLLER FOR LIQUID FUEL SUPPLY TO HCCI-DRIVEN ENGINE** 793
Michael Schiffer[1], Piotr Mackowiak[1], Ha-Duong Ngo[1,2], Oswin Ehrmann[1], Martin Schneider-Ramelow[1], and Klaus-Dieter Lang[1]
[1]*Fraunhofer IZM, GERMANY and* [2]*Hochschule für Technik und Wirtschaft Berlin, GERMANY*

Session Th2D - Microfluidic II

Session Co-Chairs: Jungyul Park, *Sogang University, KOREA*
and Niels Tas, *University of Twente, THE NETHERLANDS*

Hall Europa

11:15 - 11:30

Th2D.001 **NANOPARTICLE CAPTURE USING ULTRASONIC ACTUATION** 797
Ruhollah Habibi and Adrian Neild
Monash University, AUSTRALIA

11:30 - 11:45

Th2D.002 **ON-CHIP CAVITATION GENERATION BASED ON ULTRA-HIGH-SPEED FLOW CONTROL** 801
Yusuke Kasai, Shinya Sakuma, and Fumihito Arai
Nagoya University, JAPAN

11:45 - 12:00

Th2D.003 **MICROFABRICATED AIR-MICROFLUIDICS VIRTUAL IMPACTOR WITH GROOVE-BASED ENVELOPE-FLOW PARTICLE FOCUSING SYSTEM** 805
Omid Mahdavipour, Dorsa Fahimi and Igor Paprotny
University of Illinois, Chicago, USA

12:00 - 12:15

Th2D.004 **ESTABLISHMENT OF TREATMENT OF RETINAL VEIN OCCLUSION BY PHYSICAL STIMULI OF ELECTRICALLY-INDUCED BUBBLES** 809
Mei Sumimoto[1], Daisuke Matsumura[1], Keita Ichikawa[1], Keiko Miwa[1], Hideyasu Oh[2], Yasuhiro Moriizumi[3], and Yoko Yamanishi[1]
[1]*Kyushu University, JAPAN,* [2]*Hyogo Prefectural Amagasaki General Medical Center, JAPAN, and* [3]*BEX co., Ltd, JAPAN*

12:15 - 12:30

Th2D.005 **MAXIMUM PRESSURE CAUSED BY DROPLET IMPACT IS DEPENDENT ON THE DROPLET SIZE** 813
Thanh-Vinh Nguyen[1] and Isao Shimoyama[2]
[1]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and* [2]*Toyama Prefecture University, JAPAN*

12:30 - 12:45

Th2D.006 **A NOVEL WEARABLE SWEAT RATE SENSOR FOR BOTH DOMINANT AND RECESSIVE SWEAT RATE MEASUREMENT** 817
Kunpeng Gao, Xiaolin Wang, Bin Yang, Xiang Chen, Xiuyan Li and Jingquan Liu
Shanghai Jiao Tong University, CHINA

12:45 - 13:00	**Transition**
13:00 - 13:30	**Best Paper Award Ceremony and Closing Remarks** Convention Hall I - A/B
13:30	**Conference Adjourns**

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POSTER PRESENTATIONS

Convention Hall II

MONDAY	TUESDAY	WEDNESDAY
14:30 - 16:30	14:30 - 16:30	14:30 - 16:30

POSTER CATEGORIES

- Acoustic Microdevices and RF MEMS
- Bio-Sensors and Bio-Microsystems
- Chemical and Environmental Sensors and Microsystems
- Energy and Power MEMS
- Integrated Photonics and Optical MEMS
- Materials, Fabrication and Packaging Technologies
- Mechanical/Physical Sensors and Microsystems
- Medical Microsystems
- Microfluidics (Non-Bio)
- Nanoscale Devices and Nanomaterials
- Transducers with Soft, Flexible or Composite Materials

MONDAY - Acoustic Microdevices and RF MEMS

TUESDAY - Acoustic Microdevices and RF MEMS

WEDNESDAY - Acoustic Microdevices and RF MEMS

MONDAY - Bio-Sensors and Bio-Microsystems

TUESDAY - Bio-Sensors and Bio-Microsystems

WEDNESDAY - Bio-Sensors and Bio-Microsystems

TUESDAY - Chemical and Environmental Sensors and Microsystems

MONDAY - Energy and Power MEMS

TUESDAY - Energy and Power MEMS

WEDNESDAY - Energy and Power MEMS

MONDAY - Integrated Photonics and Optical MEMS

TUESDAY - Integrated Photonics and Optical MEMS

WEDNESDAY - Integrated Photonics and Optical MEMS

MONDAY - Materials, Fabrication and Packaging Technologies

TUESDAY - Materials, Fabrication and Packaging Technologies

WEDNESDAY - Materials, Fabrication and Packaging Technologies

MONDAY - Mechanical/Physical Sensors and Microsystems

TUESDAY - Mechanical/Physical Sensors and Microsystems

WEDNESDAY - Mechanical/Physical Sensors and Microsystems

MONDAY - Medical Microsystems

TUESDAY - Medical Microsystems

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WEDNESDAY - Medical Microsystems

MONDAY - Microfluidics (Non-Bio)

TUESDAY - Microfluidics (Non-Bio)

WEDNESDAY - Microfluidics (Non-Bio)

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MONDAY - Nanoscale Devices and Nanomaterials

TUESDAY - Nanoscale Devices and Nanomaterials

WEDNESDAY - Nanoscale Devices and Nanomaterials

MONDAY - Transducers with Soft, Flexible or Composite Materials

TUESDAY - Transducers with Soft, Flexible or Composite Materials

WEDNESDAY - Transducers with Soft, Flexible or Composite Materials

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