

Optical MEMS & Nanophotonics 2013 Preliminary Program

MONDAY, AUGUST 19

8:45 Opening

8:55 MM-S1 Plenary Session

Session Chair: Minoru Sasaki (Toyota Technological Institute, Japan)

MM-S1.1

PLENARY TALK

CONTROLLING PHOTONS IN MESOSCOPIC SYSTEMS: PRECISION MEASUREMENTS IN FREQUENCY COMBS AND OPTOMECHANICS

Chee Wei Wong

Columbia University, USA

MM-S1.2

PLENARY TALK

OPTICAL MEMS AND NANOPHOTONICS IN SAMSUNG ELECTRONICS

Hyung Choi, Minseog Choi, Dongsik Shim, Sung Hyun Nam

Samsung Advanced Institute of Technology, Korea



Coffee Break

10:15 MM-S2 Imaging Devices

Session Chair: Jer-Liang Andrew Yeh (National Tsing Hua University, Taiwan)

MM-S2.1

INVITED TALK

IMPLANTABLE MICRO CMOS IMAGING DEVICES FOR BIOMEDICAL APPLICATIONS

Jun Ohta, Toshihiko Noda, Kiyotaka Sasagawa, Takashi Tokuda

Nara Institute of Science and Technology, Japan

MM-S2.2

FORWARD-VIEWING ENDOSCOPIC OCT CATHETER USING ASYMMETRICALLY RESONANT FIBER SCANNER

Hyeon-Cheol Park¹, Yeong-Hyeon Seo¹, Seung-Bum Yang¹, Minseog Choi², Seungwan Lee², Woonbae Kim², Ki-Hun Jeong¹

¹Korea Advanced Institute of Science and Technology (KAIST), Korea, ²Samsung Advanced Institute of Technology (SAIT), Korea
(1074)

MM-S2.3

TUNABLE CONFOCAL HYPERSPECTRAL IMAGING SYSTEM

Phuong-Ha Cu-Nguyen¹, Adrian Grewe², Stefan Sinzinger², Hans Zappe¹, and Andreas

Seifert¹

¹University of Freiburg, IMTEK, Germany, ²Ilmenau University of Technology, Germany
(1028)

MM-S2.4

TUNABLE CAT'S EYE RETRO-REFLECTOR ARRAY AS AN OPTICAL IDENTIFICATION TAG

Ming-chun Su, Chih-chieh Chang, Yu-cheng Yang, and Jui-che Tsai

National Taiwan University, Taiwan

(1020)

MM-S2.5

AN ELECTROTHERMAL/ELECTROSTATIC DUAL DRIVEN MEMS SCANNER WITH LARGE IN-PLANE AND OUT-OF-PLANE DISPLACEMENT

Xiaoyang Zhang¹, Lin Liu¹, Wenxuan Liang², Xingde Li², Huikai Xie¹

¹University of Florida, USA, ²John Hopkins University, USA

(1045)

MM-S2.6

A MEMS INTERACTIVE LASER PROJECTION DISPLAY WITH A BUILT-IN LASER RANGE FINDER

Sungho Jeon¹, Hiroyuki Fujita², and Hiroshi Toshiyoshi¹

¹The University of Tokyo, Japan, ²Institute of Industrial Science, The University of Tokyo, Japan

(1014)

MM-S2.7

THERMOELECTRICALLY CONTROLLED VARIFOCAL MICROMIRROR FOR NEAR ABERRATION FREE IMAGING

Li Li, Ran Li, Walter Lubeigt, Deepak Uttamchandani

University of Strathclyde, UK

(1026)

Lunch

13:30 MA-S1 Electrostatic Actuation

Session Chair: Dan Marom (Hebrew University of Jerusalem, Israel)

MA-S1.1

A PHYSICAL MODELING AND LONG-TERM MEASUREMENT OF TILTING ANGLE DRIFT CAUSED BY DIELECTRIC SURFACE CHARGING IN MEMS MICROMIRRORS

Mitsumasa Nakajima, Kei Kuwabara, Takako Ishihara, Tomomi Sakata, Mitsuo Usui, Naru Nemoto, Etsu Hashimoto, Joji Yamaguchi, Shingo Uchiyama, and Yoshito Jin

NTT Microsystem Integration Laboratories, Japan

(1006)

MA-S1.2

A TIME-MULTIPLEXED ELECTROSTATIC DRIVE AND SAMPLE INTERFACE CIRCUIT FOR MEMS OPTICAL SCANNERS

Satoshi Maruyama¹, Toshifumi Konishi^{2,3}, Katsuyuki Machida^{2,3}, Noboru Ishihara³, Kazuya Masu³, Hiroyuki Fujita¹, and Hiroshi Toshiyoshi¹

1Institute of Industrial Science, The University of Tokyo, Japan, 2 NTT Advanced Technology Corp., Japan, 3 Tokyo Institute of Technology, Japan
(1082)

MA-S1.3

HIGH-REFLECTIVITY, BROADBAND MONOLITHIC SILICON PHOTONIC CRYSTAL MIRRORS ON TWO-AXIS MEMS SCANNER BY TRANSFER-PRINTING

Jae-Woong Jeong^{1,2}, Bryan Park¹, Hohyun Keum², Seok Kim², John A. Rogers² and Olav Solgaard¹

¹Stanford University, USA, ²University of Illinois at Urbana-Champaign, USA
(1017)

MA-S1.4

HIGH CONTRAST, CRYOGENIC, LARGE MICROMIRROR ARRAY FOR MULTI-OBJECT SPECTROSCOPY

Frederic Zamkotsian¹, Michael Canonica^{2,3}, Patrick Lanzoni¹, Wilfried Noell²

¹Laboratoire d'Astrophysique de Marseille - CNRS, France, ²Ecole Polytechnique Fédérale de Lausanne, Switzerland, ³MIT, USA

(1062)

MA-S1.5

ASSEMBLY OF 3D MEMS MIRRORS AND SCANNERS USING COMPLIANT PUSH PADS

Yi Chiu, Yan-Ting Wu, Hao-Chiao Hong

National Chiao Tung University, Taiwan

(1063)

Coffee Break

15:15 MA-S2 Lenses

Session Chair: Hans Zappe (University of Freiburg, Germany)

MA-S2.1

ALIGNMENT TOLERANCES OF MEMS ALVAREZ LENSES

Yongchao Zou, Guangya Zhou, Yu Du and Fook Siong Chau

National University of Singapore, Singapore

(1057)

MA-S2.2

ARTIFICIAL COMPOUND EYE WITH FRACTAL ZONE PLATE ARRAYS

Dongmin Keum, Ki-Hun Jeong

Korea Advanced Institute of Science and Technology, Korea

(1077)

MA-S2.3

ASYMMETRIC MICROSTRUCTURES FOR HIGH LIGHT EXTRACTION AND LIGHT PATTERN MODULATION

Jae-Jun Kim, Dongmin Keum, Ki-Hun Jeong

Korea Advanced Institute of Science and Technology, Korea

(1090)

MA-S2.4

FABRICATION AND CHARACTERIZATION OF THIN-FILM NANOSTRUCTURED LUENEURG LENS

Chih-Hung Hsieh¹, Jun Xu¹ Hanhong Gao¹, Nicholas X. Fang¹ and George Barbastathis^{1,2}
¹Massachusetts Institute of Technology, USA., ²Singapore-MIT Alliance for Research and
Technology (SMART) Centre, Singapore
(1035)

Excursion:

Group A: Nagamachi Samurai District

Group B: Kanazawa Castle Park



TUESDAY, AUGUST 20

8:40 TM-S1 Light Emissions

Session Chair: Wibool Piyawattanametha (National Electronics and Computer Technology Center, Thailand)

TM-S1.1

INVITED TALK

WAVELENGTH ENGINEERING OF VCSELS BASED ON MEMS TECHNOLOGIES

Fumio Koyama

Tokyo Institute of Technology, Japan

TM-S1.2

FABRICATION AND CHARACTERIZATION OF NANO-APERTURE VCSELS FOR 10 TB/IN² MAGNETIC STORAGE DENSITIES

Sajid Hussain, C.S. Bhatia, Hyunsoo Yang and Aaron J. Danner

National University of Singapore, Singapore

(1059)

TM-S1.3

EXPERIMENTAL STUDY ON NANOSCALE TEMPERATURE MEASUREMENT METHOD USING ROTATION OF NEAR-FIELD POLARIZATION

Jumpei Nitta, Sho Kishimoto, Yoshihiro Taguchi, Toshiharu Saiki, Yuji Nagasaka

Keio University, Japan

(1040)

TM-S1.4

A MICROPLASMA CHIP FOR RADICAL MONITOR

Ryoto Sato¹, Daisuke Yasumatsu¹, Shinya Kumagai¹, Masaru Hori², Minoru Sasaki¹

¹Toyota Technological Institute, Japan

²Nagoya University, Japan

(1046)

TM-S1.5

SURFACE PLASMON POLARITON BASED WAVELENGTH SELECTIVE IR EMITTER COMBINED WITH MICROHEATER

Takahiro Sawada¹, Katsuya Masuno², Shinya Kumagai¹, Makoto Ishii², Shouichi Uematsu², and Minoru Sasaki¹

¹Toyota Technical Institute, Japan

²Yazaki Corporation, Japan

(1060)

Coffee Break

10:35 TM-S2 Sensing

Session Chair: Guangya Zhou (National University, Singapore)

TM-S2.1

INVITED TALK

POLYMER OPTICAL MEMS INTEGRATED ON VCSELS FOR BIOSENSING

Véronique Bardinal^{1,2}, Thierry Camps^{1,3}, Benjamin Reig^{1,2}, Jean-Baptiste Doucet^{1,2}, Sami



Abada^{1,2}, and E. Daran^{1,2}

1 CNRS, LAAS, France, 2 Univ de Toulouse, LAAS, France, 3 Univ de Toulouse, UPS, LAAS, France

TM-S2.2

MONOLITHIC PHOTONIC CRYSTAL-BASED FIBER-TIP FABRY-PÉROT STATIC PRESSURE SENSOR

Xuan Wu, Catherine Jan, Olav Solgaard
Stanford University, USA
(1001)

TM-S2.3

SELF-ALIGNED MICROBONDING TECHNIQUE FOR MAKING BUTT-COUPLED GERMANIUM METAL-SEMICONDUCTOR-METAL WAVEGUIDE PHOTODETECTORS

Wei-Ting Chen, Chih-Kuo Tseng, Ku-Hung Chen, Neil Na, and Ming-Chang M. Lee
Institute of Photonics Technologies, National Tsing Hua University, Taiwan
(1042)

TM-S2.4

A REVIEW OF MEMS SCANNER BASED ENDOSCOPIC OPTICAL IMAGING PROBE

Wibool Piyawattanametha^{1,2}

1 National Electronics and Computer Technology Center, Klong Luang, Thailand

2 Advanced Imaging Research Center, Faculty of Medicine, Chulalongkorn University, Thailand

TM-S2.5

ALTERATION BY REPEATED ELECTROSTATIC MEMS ACTUATION OF THE THERMOLUMINESCENCE OF THIN FILMS

Merlin L. Mah, Philip R. Armstrong, Joseph J. Talghader
University of Minnesota, USA
(1070)

TM-S2.6

RESONANT CAVITY COUPLED INFRARED DETECTORS WITH HIGH DETECTIVITY OPERATING AT ROOM TEMPERATURE

Anand S. Gawarikar, Ryan P. Shea and Joseph J. Talghader
University of Minnesota, USA
(1036)

Lunch

13:35 TA-S1 Wavelength Selective Devices

Session Chair: Joseph Talghader (University of Minnesota, USA)

TA-S1.1

INVITED TALK

MINIATURIZED MOEMS SPECTROMETER TECHNOLOGY FOR GAS SENSING

Jarkko Antila, Anna Rissanen, Rami Mannila, Jussi Mäkyänen, Ismo Näkki, Mikko Tuohiniemi
VTT Technical Research Centre, Finland

TA-S1.2

WAVELENGTH SELECTIVE UNCOOLED INFRARED SENSOR USING TRIANGULAR-LATTICE PLASMONIC ABSORBERS

Shinpei Ogawa¹, Junya Komoda², Kyohei Masuda², Yousuke Takagawa², and Masafumi Kimata²

¹Mitsubishi Electric Corporation, Japan, ²Ritsumeikan University, Japan
(1084)

TA-S1.3

VERTICAL FIELD ENHANCED NANOSTRUCTURE FOR QUANTUM WELL INFRARED PHOTODETECTOR THROUGH GERMANIUM SUBWAVELENGTH ARRAYS

Wei Dong^{1, 2}, Toru Hirohata¹, Kazutoshi Nakajima¹, Xiaoping Wang²

¹Hamamatsu Photonics K. K., Japan

²Zhejiang University, China

(1004)

TA-S1.4

MIRRORS AND ANTI-REFLECTIVE SURFACES IN SINGLE CRYSTAL SILICON BY PATTERNING OF THE SILICON SURFACE

Sanja Hadzialic, Maaikje M. Visser Taklo

SINTEF ICT, Norway

(1022)

Coffee Break

15:15 TA-S2 Micromirrors

Session Chair: Hiroshi Miyajima (Olympus, Japan)

TA-S2.1

DESIGN AND FABRICATION OF AN ELECTROMAGNETICALLY ACTUATED OPTICAL SWITCH WITH PRECISE TILT ANGLE CONTROL

Victor Farm-Guoo Tseng, Jiping Li, Xiaoyang Zhang, Huikai Xie

University of Florida, USA

(1008)

TA-S2.2

INTEGRATION OF ANGULAR RATE SENSOR ON LARGE DEFLECTION POLYMER-MEMS MIRROR

Hirofumi Yamashita, Kyohei Terao, Hidekuni Takao, Fusao Shimokawa, Fumikazu Oohira, and Takaaki Suzuki

Kagawa University, Japan

(1044)

TA-S2.3

MAGNETICALLY ACTUATED SWING-TYPE MICROMIRROR

Hsu-Tang Chang, Chun-Wei Tsai, Shih-Hsiang Liu, and Jui-che Tsai

Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering National Taiwan University, Taiwan

(1025)

TA-S2.4

MEMS WAVELENGTH-SELECTIVE SWITCH INCORPORATING LIQUID CRYSTAL SHUTTERS FOR ATTENUATION AND HITLESS OPERATION

Uri Arad¹, Yossi Corem¹, Boris Frenkel¹, Valery Deich¹, Jonathan Dunayevsky¹, Roey Harel², Peter Janosik², Gil Cohen² and Dan M. Marom³

¹Oclaro Corp., Israel ²Oclaro Corp., USA, ³Hebrew University, Israel
(1092)

Excursion:

Group A: Kanazawa Castle Park

Group B: Nagamachi Samurai District



WEDNESDAY, AUGUST 21

8:40 WM-S1 Bio-applications I

Session Chair: Ki-Hun Jeong (KAIST, Korea)

WM-S1.1

INVITED TALK

CELL LEGO

Hiroo Iwata

Kyoto University, Japan

WM-S1.2

DIRECT NUCLEAR DELIVERY OF DNA MACROMOLECULES USING THE PHOTOTHERMAL NANOBLADE

Ting-Hsiang Wu¹, Yi-Chien Wu¹, Enrico Sagullo¹, Michael A. Teitell¹, Pei-Yu Eric Chiou¹

¹University of California, Los Angeles, USA

(1066)

WM-S1.3

OPTOELECTRONIC TWEEZERS INTEGRATED WITH 3D MICROFLUIDIC NETWORKS

Kuo-Wei Huang¹, Yu-Chun Kung¹, Yi-Chien Wu¹, Yu-Jui Fan² and Pei-Yu Chiou¹

¹University of California at Los Angeles, USA, ²National Taiwan University, Taiwan

(1058)

WM-S1.4

FLUOROMETRIC GAS-PHASE BIOSENSOR (BIO-SNIFFER) WITH UV-LED EMISSION LIGHT FOR FORMALDEHYDE VAPOR

Ye Ming¹, Tomoko Gessei^{1, 2}, Kumiko Miyajima¹, Munkhbayar Munkhjargal, Takahiro

Arakawa¹, Kohji Mitsubayashi¹

¹Inst. of Biomaterials and Bioengineering, Tokyo Medical and Dental Univ., Japan, ²Tokyo

Metropolitan Industrial Technology Research Institute, Japan

(1083)

WM-S1.5

MICRO-SCANNING MIRRORS FOR HIGH-POWER LASER APPLICATIONS IN LASER SURGERY

Thilo Sandner¹, Simon Kimme¹, Thomas Grasshoff¹, Ulrich Todt¹, Alexander Graf¹,

Christian Tulea², Achim Lenenbach², Harald Schenk¹

¹Fraunhofer Institute for Photonic Microsystems (IPMS), AMS, Dresden, Germany, ²

Fraunhofer Institute for Laser Technology (ILT), Aachen, Germany

(1076)

Coffee Break

10:35 WM-S2 Waveguides

Session Chair: George Barbastathis (MIT, USA)

WM-S2.1

INVITED TALK

SILICON-ORGANIC HYBRID (SOH) TECHNOLOGY: A PLATFORM FOR EFFICIENT ELECTRO-OPTICAL DEVICES

C. Koos,^{1,2} J. Leuthold,³ W. Freude,^{1,2} L. Alloatti,¹ R. Palmer,¹ D. Korn,¹ J. Pfeifle,¹ P. C.

Schindler,1 M. Lauermann,1,2

1 Institute of Photonics and Quantum Electronics (IPQ), Karlsruhe Institute of Technology (KIT), Germany, 2 Institute of Microstructure Technology (IMT), Karlsruhe Institute of Technology (KIT), Germany, 3 now with ETH Zurich, Switzerland

WM-S2.2

TRANSMISSION WIDTH (Q-FACTOR) TUNABLE SILICON-PHOTONIC MICRO-RING RESONATORS

Mustafa Ordu, Yoshiaki Kanamori, Kazuhiro Hane
Tohoku University, Japan
(1011)

WM-S2.3

OPTICAL MICRORING RESONATORS IN LITHIUM NIOBATE FOR CLASSICAL AND QUANTUM MICROWAVE PHOTONICS

Deng Jun1,2, Sajid Hussian1, Soham Saha1, Ching Eng Png2, Mankei Tsang1, and Aaron J. Danner1
1 National University of Singapore, Singapore, 2 Institute of High Performance Computing, Agency for Science, Technology and Research, Singapore
(1051)

WM-S2.4

THERMALLY TUNABLE PHOTONIC DUAL-DISK RESONATOR WITH WIDE OPERATION RANGE

Bo Li, Chong Pei Ho and Chengkuo Lee
National University of Singapore, Singapore
(1085)

WM-S2.5

MICRO-CHANNEL DEVICE FOR SPECTRUM MEASUREMENT USING OPTICAL FIBER ALIGNED WITH BIAS SPRING WITH REVERSELY TAPERED PROFILE

Hikaru Iimura, Dinghuan Deng, Shinya Kumagai, Yasutake Ohishi, Minoru Sasaki
Toyota Technical Institute, Japan
(1018)

WM-S2.6

SIDE-POLISHED FIBER OPTOFLUIDIC ATTENUATOR BASED ON ELECTROWETTING-ON-DIELECTRIC ACTUATION

Anna Duduś, Robert Blue, Michele Zagnoni and Deepak Uttamchandani
University of Strathclyde, UK
(1024)

Lunch

13:45 WA-S1 Bio-applications II

Session Chair: Chengkuo Lee (National University of Singapore)

WA-S1.1

INVITED TALK

IMPLANTABLE DEVICES FOR OPTICAL NEURAL INTERFACES

T.V.F. Abaya, M. Diwekar, S. Blair, P. Tathireddy, L. Rieth and F. Solzbacher
University of Utah, USA

14:10 WA-P Poster Presentation

WA-P.1

2D MEMS SCANNER WITH A ROTATION-ANGLE DETECTOR FOR A TIME-OF-FLIGHT
IMAGE SENSOR

I. Aoyagi, K. Hamaguchi, Y. Nonomura, T. Akashi
Toyota Central R&D Labs., Inc., Japan
(1088)

WA-P.2

DUAL-AXIS POLYMER-MEMS MIRROR MADE OF PHOTSENSITIVE NANOCOMPOSITE

Junya Suzuki¹, Takuya Miura¹, Kyohei Terao¹, Hidekuni Takao¹, Fusao Shimokawa¹, Takahiro
Namazu², Fumikazu Oohira¹, and Takaaki Suzuki¹

¹Kagawa University, Japan, ²University of Hyogo, Japan
(1071)

WA-P.3

QUASI-STATIC MICROSCANNER WITH LINEARIZED SCANNING FOR AN ADAPTIVE
3D-LASERCAMERA

Thilo Sandner, Thomas Grasshoff, Markus Schwarzenberg, Harald Schenk
Fraunhofer Institute for Photonic Microsystems (IPMS), Germany
(1075)

WA-P.4

SURFACE-MICROMACHINED MEMS CORNER CUBE RETRO-REFLECTOR ARRAY

Yu-fan Chen, Hsu-tang Chang, Bo-jiun Chen, and Jui-che Tsai
National Taiwan University, Taiwan
(1027)

WA-P.5

A 3.3V OPERATED VARIABLE TRANSMISSION ATTENUATOR BASED ON
SUBWAVELENGTH GRATING

Hiroaki Honma¹, Kazuhiro Takahashi¹, Hiromu Ishii¹, Makoto Ishida^{1, 2}, and Kazuaki Sawada^{1, 2}

¹Toyohashi University of Technology, Japan, ²Electronics-Inspired Interdisciplinary Research
Institute (EIIRIS), Japan
(1041)

WA-P.6

ELECTROTHERMALLY ACTUATED LARGE DISPLACEMENT WAVEGUIDES

Sean R. Samuelson and Huikai Xie
University of Florida, USA
(1065)

WA-P.8

GLASS REFLOW PROCESS FOR AN ELECTRICAL ISOLATION AND TEMPORARY
SUPPORT OF TWO-DIMENSIONAL MICROSCANNER

Minyoung Yun, Daehun Jeong, Seunghwan Moon, Jong-Hyun Lee
Gwangju Institute of Science and Technology, Korea
(1087)

WA-P.9

IMPROVEMENT IN SIDEWALL ROUGHNESS OF MEMS X-RAY OPTICS

Masahiro Ikuta¹, Yuichiro Ezoe¹, Ikuyuki Mitsuishi¹, Tomohiro Ogawa¹, Takuya Kakiuchi¹, Takaya Ohashi¹, Kazuhisa Mitsuda²

¹Tokyo Metropolitan University, Japan, ²ISAS/JAXA, Japan
(1009)

WA-P.10

ASSEMBLY OF A MEMS-BASED WOLTER TYPE-I X-RAY OPTIC TOWARD A FUTURE PLANETARY EXPLORATION MISSION

Ikuyuki Mitsuishi¹, Yuichiro Ezoe¹, Tomohiro Ogawa¹, Takuya Kakiuchi¹, Masahiro Ikuta¹, Takayuki Hayashi², Toshiaki Sato¹, Takaya Ohashi¹, Kazuhisa Mitsuda², Kohei Morishita³, Kazuo Nakajima³

¹Tokyo Metropolitan University, Japan, ²ISAS/JAXA, Japan, ³Kyoto University, JAPAN
(1050)

WA-P.11

APPLICATION OF NANO-IMPRINT TECHNOLOGY TO GRATING SCALE FOR A ROTARY MICROENCODER

Toshihiro Takeshita¹, Takuma Iwasaki¹, Eiji Higurashi², Tatsuya Miyazaki¹, Renshi Sawada¹

¹Kyushu University, Japan, ²The University of Tokyo, Japan
(1016)

WA-P.12

EVALUATION OF TRANSPARENT POLYIMIDE FILM AS BIOLOGICAL CELL CULTURE SHEET WITH MICROSTRUCTURES FOR BIOMEDICAL ENGINEERING

Hiroataka Maenosono, Hirofumi Saito and Yasuhiro Nishioka

Nihon University, Japan
(1052)

WA-P.13

PHOTOCHEMICAL POLISHING OF SAPPHIRE SUBSTRATE BASED ON NONADIABATIC OPTICAL NEAR-FIELD ETCHING

J. Suzuki¹, K. Hirata², K. Iwami¹, A. Taguchi¹, N. Umeda¹

¹Tokyo University of Agriculture and Technology, Japan, ²Sigma Koki Co., Ltd., Japan
(1043)

WA-P.14

INFRARED COLLECTING MICROLENS INTEGRATED WITH SI PHOTO CELL

Takuro Aonuma, Shinya Kumagai, Minoru Sasaki

Toyota Technical Institute, Japan
(1091)

WA-P.15

COLLOIDAL PARTICLE SORTING WITH SCATTERING FORCE VIA PLANAR WAVEGUIDE

Masahiro Motosuke, Hideharu Kotari

Tokyo University of Science, Japan
(1067)

WA-P.16

NEAR-INFRARED PHOTOTHERMAL ACTIVATION OF MICROGELS INCORPORATING POLYPYRROLE NANOTRANSDUCERS THROUGH DROPLET MICROFLUIDICS

Rongcong Luo¹ and Chia-Hung Chen^{1,2}

¹National University of Singapore, Singapore, ²Singapore Institute for Neurotechnology (SiNAPSE), National University of Singapore
(1078)

WA-P.17

HIGH SENSITIVE SILICON OPTICAL INDEX SENSOR BASED ON RING-ASSISTED MACH-ZEHNDER INTERFEROMETER

Tianhang Zhang, Bo Li, Chong Pei Ho and Chengkuo Lee

National University of Singapore, Singapore
(1093)

WA-P.18

EXPERIMENTAL VERIFICATION OF PHONONIC CRYSTAL SLAB BASED SILICON MICRORESONATORS

Nan Wang^{1,2}, Min Tang², Fu-Li Hsiao³, Chong Pei Ho¹, Moorthi Palaniapan¹, Dim-Lee Kwong², and Chengkuo Lee¹

¹National University of Singapore, Singapore, ²Institute of Microelectronics, Agency for Science, Technology and Research (A*STAR), Singapore, ³National Changhua University of Education, Taiwan
(1054)

WA-P.19

FAST GUIDED MODE OF A PHOTONIC CRYSTAL WAVEGUIDE

Borriboon Thubthimthong, Kazuhiro Hane

Tohoku University, Japan
(1048)

WA-P.20

FLEXIBLE NANOPOROUS ANODIC ALUMINUM OXIDE(NP-AAO) TEMPLATE COATED WITH SELF-ASSEMBLED AU NANOCROWN ARRAY FOR NANOPHOTONIC SWITCHING

Chitsung Hong¹, Weileun Fang², Bor-Yuan Shew¹

¹National Synchrotron Radiation Research Center (NSRRC), Taiwan
²National Tsing Hua University, Taiwan
(1069)

WA-P.22

ULTRASENSITIVE BIOSENSORS USING FANO RESONANCES IN DOUBLE-LAYER GOLD NANOSTRUCTURES

Kuang-Li Lee¹, Jhih-Bin Huang², Shu-Han Wu³ and Pei-Kuen Wei^{1, 2, 3}

¹ Academia Sinica, Taiwan, ² National Taiwan Ocean University, Taiwan, ³ National Yang-Ming University, Taiwan
(1053)

WA-P.23

SENSITIVITY-ENHANCED SERS SUBSTRATE FABRICATION BY NANOIMPRINTING COMPRESSED PDMS ELASTOMER

Wen-Kai Kuo, Jia-Nan Yan, Wing-Ming Chou, Hsin-Her Yu
National Formosa University, Taiwan

(1015)

WA-P.24

DEVELOPMENT OF TUNABLE 3-D eSRR FOR THz APPLICATIONS

Fusheng Ma, Yu-Sheng Lin, You Qian, Chong Pei Ho, Prakash Pitchappa, and Chengkuo Lee
National University of Singapore, Singapore

(1007)

WA-P.25

COMPLEMENTARY METAMATERIAL INFRARED ABSORBER

Prakash Pitchappa^{1,2}, Chong Pei Ho^{1,2}, Piotr Kropelnicki² and Chengkuo Lee¹
1National University of Singapore, Singapore, 2Institute of Microelectronics (IME), Agency for
Science, Technology and Research (A*STAR), Singapore

(1068)

WA-P.26

OPTIMAL DESIGN OF PHOTODETECTOR WITH MULTI-SLIT GRATING

Ayumi Takeda, Takuma Aihara, Masashi Fukuhara, Yuya Ishii, Mitsuo Fukuda
Toyohashi University of Technology, Japan

(1038)

WA-P.27

POLARIZATION-INDEPENDENT PHOTODETECTOR WITH RING-TYPE GRATING

Ayumi Takeda, Takuma Aihara, Masashi Fukuhara, Yuya Ishii, Mitsuo Fukuda
Toyohashi University of Technology, Japan

(1089)

WA-P.29

A MODIFIED PLASMON RULER EQUATION FOR QUASI-ORDERED PLASMONIC
NANOISLANDS

Minhee Kang, Ki-Hun Jeong
Korea Advanced Institute of Science and Technology, Korea

(1073)

WA-P.30

LOCAL FIELD EFFECT ON Nd³⁺-DOPED α -NaYF₄ NANOCRYSTALS IN LIQUIDS

Xiaojie Xue, Takenobu Suzuki, Yasutake Ohishi
Research Center for Advanced Photonic Technology, Toyota Technical Institute, Japan

(1079)

Excursion: Kenrokuen Garden



Banquet: Kinjohro <http://www.kinjohro.co.jp/>



THURSDAY, AUGUST 22

8:40 ThM-S1 Deformable Devices

Session Chair: Hiroshi Toshiyoshi (University of Tokyo, Japan)

ThM-S1.1

INVITED TALK

MEMS AND NEMS WITH INTEGRATED CAVITY OPTOMECHANICAL READOUT

Vladimir Aksyuk¹, Jie Zou^{1,2}, Yuxiang Liu^{1,2}, Houxun Miao^{1,2}, Marcelo Davanco^{1,3}, Kartik Srinivasan¹

¹ National Institute of Standards and Technology, USA, ² University of Maryland, USA, ³ California Institute of Technology, USA

ThM-S1.2

SILICON-RIM-REINFORCED SILICON NITRIDE MICROSCANNER WITH VERTICAL COMB ACTUATOR AND WAFER-LEVEL VACUUM PACKAGING

Joo-Young Jin, Sunghyun Yoo, Jae-Sung Bae, and Yong-Kweon Kim

Seoul National University, Korea
(1003)

ThM-S1.3

REEFORM HIGH-SPEED LARGE-AMPLITUDE DEFORMABLE PIEZO MIRRORS

Matthias C Wapler, Jens Brunne and Ulrike Wallrabe

University of Freiburg, Germany
(1032)

ThM-S1.4

FOCUSING MIRROR WITH TUNABLE ECCENTRICITY

Moritz Stürmer, Matthias C. Wapler, Jens Brunne and Ulrike Wallrabe

University of Freiburg – IMTEK, Germany
(1029)

ThM-S1.5

DISPLACEMENT-AMPLIFIED DYNAMIC VARIFOCAL MIRROR USING MECHANICAL RESONANCE

Takashi Sasaki, Daiki Sato, Kazuhiro Hane

Tohoku University, Japan
(1072)

ThM-S1.6

AN INFRARED DETECTOR BASED ON NONLINEAR OSCILLATION

Daisuke Momonoi, Tatsuya Yamazaki, Shinya Kumagai, Minoru Sasaki

Toyota Technological Institute, Japan
(1047)

Coffee Break

10:50 ThM THz Applications

Session Chair: Jui-Che Tsai (National Taiwan University, Taiwan)



ThM-S2.1

INVITED TALK

ELECTROSTATIC MEMS TUNABLE SPLIT-RING RESONATORS FOR THZ FILTER APPLICATIONS

Zhengli Han¹, Kenta Kohno¹, Tomi Haatainen², Tapio Makela², Hiroyuki Fujita¹, Kazuhiko Hirakawa¹, and Hiroshi Toshiyoshi¹¹Institute of Industrial Science, The University of Tokyo, Japan, ²VTT Microsystems and Nanoelectronics, Finland**ThM-S2.2**

TUNABLE THz FILTER USING 3-D SPLIT-RING RESONATORS

Yu-Sheng Lin^{1,2}, Chong Pei Ho^{1,2}, Prakash Pitchappa^{1,2}, Fusheng Ma¹, You Qian¹, Piotr Kropelnicki² and Chengkuo Lee¹¹National University of Singapore, Singapore, ²Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore
(1037)**ThM-S2.3**

A 3-D MOVABLE THz FILTER USING SURFACE MICROMACHINING PROCESS

Yu-Sheng Lin, Fusheng Ma and Chengkuo Lee

National University of Singapore, Singapore
(1019)**ThM-S2.4**

BIPOLAR OPTICAL FORCES IN COUPLED PHOTONIC CRYSTAL CAVITIES

Feng Tian, Guangya Zhou, Yu Du, and Fook Siong Chau

National University of Singapore, Singapore
(1055)**ThM-S2.5**

APPLICATIONS OF NANO-ELECTROMECHANICAL ACTUATORS IN NANO OPTOMECHANICS

Feng Tian, Guangya Zhou*, Yu Du, and Fook Siong Chau

National University of Singapore, Singapore
(1056)**Optional Tour: Shirakawa-go**<http://travel.kankou-gifu.jp/en/see-and-do/2/>