Optical MEMS & Nanophotonics 2010

Sunday, August 8

17:00-19:00 **Optical MEMS & Nanophotonics 2010 Welcome Cocktail**
From 5 PM to 7PM, Sunday, August 8.
"Old Saloon 1934" at Sapporo Grand Hotel
Welcome Cocktail & Registration Desk to take place at Sapporo Grand Hotel

Monday, August 9

8:00 - **Registration Desk Open**
2nd Floor, Sapporo Convention Center

9:00 - 9:15 **OPENING: Hiroshi Toshiyoshi**

9:15 - 9:40 **INVITED TALK 1**
Ultra-High Efficiency Solar Cell Development Activity in "SOLAR QUEST", the International Research Center for Global Energy and Environmental Technologies
Yoshiaki Nakano
Research Center for Advanced Science and Technology, The University of Tokyo, Japan

SENSING DEVICES AND SYSTEMS
Chair: Minoru Sasaki & Yoshiaki Kanamori

9:40 - 10:40 M1-1
MEMS Scanner Enabled Real-Time Depth Sensitive Hyperspectral Imaging
Youmin Wang, Sheldon Bish, Ashwini Gopal, James W Tunnell, Xiaojing Zhang
The University of Texas at Austin, USA

M1-2
Vertical Comb-Drive MEMS Mirror with Sensing Function for Phase-Shift Device
Kentaro Oda, Kyohei Terao, Takaaki Suzuki, Hidekuni Takao, Ichiro Ishimaru, Fumikazu Oohira
Kagawa University, Japan

M1-3
Array of Cat's Eye Retro-Reflectors with Modulability for an Optical Identification System
Keng-hsing Chao, Chun-da Liao, Jui-che Tsai
National Taiwan University, Taiwan

M1-4
Magnetic Actuated MOEMS Resonant Biosensor Array
Erman Timurdogan, Sezin Nargul, Halil Kavakli, Erdem Alaca, Hakan Urey
Koç University, Turkey

Optofluidic Devices
Chair: Wibool Piyawattanametha

11:10 - 11:35 **INVITED TALK 2**
Development of an Integrated Microsystem for the Multiplexed Detection of Protein Markers in Serum Using Electrochemical Immunosensors
Ciara K. O'Sullivan
Universitat Rovira i Virgili and Institució Catalana de Recerca i Estudis Avançats, Spain

11:35 -12:35 M2-1
Tunable Optofluidic Micro-Iris
Philipp Müller, Nils Spengler, Wolfgang Mönch, Hans Zappe
University of Freiburg, Germany

M2-2
Single Chamber Adaptive Membrane Lens with Integrated Actuation
Jan Draheim, Florian Schneider, Tobias Burger, Robert Kamberger, Ulrike Wallrabe
University of Freiburg, Germany, Germany

M2-3
Eye-Shaped Coplanar Variable Liquid Lens Using Spherical Polymer Encapsulation
Jae Yong An, Ji Hwan Hur, Sung Kil Lee, Jong-Hyun Lee
Gwangju Institute of Science and Technology (GIST), Korea

M2-4
Dynamic Response of Dielectric Liquid Microlens
Chih-Cheng Yang, Yih-Ching Wang, J. Andrew Yeh
National Tsing Hua University, Taiwan

Micromirrors
Chair: Wilfried Noell

14:00 - 14:25 **INVITED TALK 3**
Optical Scanning with MEMS In-Plane Vibratory Gratings and Its Applications
Guangya Zhou, Yu Du, Kelvin K.L. Cheo, Hongbin Yu, Fook Siong Chau
National University of Singapore, Singapore

14:25 - 15:25 M3-1
A Large Rotational Angle MEMS Micromirror Based on Hypocycloidal Electrothermal Actuators
Xiaojing Mu[1,2], Yingshun Xu[1], Janak Singh[1], Nanguang Chen[2] , Hanhua Feng[1], Guangya Zhou[2], Aibin Yu[1], Chee Wei Tan[1], Kelvin Wei Sheng Chen[1], Fook Siong Chau[2]
[1]A*STAR (Agency for Science, Technology and Research), Singapore
[2]National University of Singapore, Singapore

M3-2
Translatory MEMS Actuator with Extraordinary Large Stroke for Optical Path Length Modulation
Thilo Sandner, Thomas Grasshoff, Harald Schenk
Fraunhofer Institute for Photonic Microsystems (IPMS), Germany

M3-3
Polymer-MEMS Torsion Mirror with Large Rotation Angle and Low Driving Voltage
Dzung Viet Dao[1], Satoshi Amaya[2], Susumu Sugiyama[1]
[1]Ritsumeikan University, Japan
[2]TOWA Corporation, JAPAN

M3-4
Low Cost and Large Deflection Angle Polymer MEMS Mirror Using Glass Substrate
Osamu Sasaki, Takaaki Suzuki, Kyouhei Terao, Hidekuni Takao, Fumikazu Oohira
Kagawa University, Japan

Fabrication and processing
Chair: Hans Zappe

15:55 - 16:20 **INVITED TALK 4**
Phosphor Sensors Using Mechanoluminescence
Chao-Nan Xu
National Institute of Advanced Industrial Science and Technology, Japan

16:20 - 17:20 M4-1
A New Fabrication Technique for Integrating Silica Optical Devices and MEMS
Karen E. Grutter, Anthony M. Yeh, Susant K. Patra, Ming C. Wu
University of California, Berkeley, U.S.A.

M4-2
Four-Mask Process Based on Spacer Technology for Scaled-Down Lateral NEM Electrostatic Actuators
Daesung Lee, W. Scott Lee, Subhasish Mitra, Roger T. Howe, H.-S. Philip Wong
Stanford University, USA

M4-3
Nanostructured Origami^{TM} Folding of Patternable Resist for 3D Lithography
Se Young Yang[1], Hyung-ryul Johnny Choi[1], Martin Deterre[1], George Barbastathis[2]
[1]Massachusetts Institute of Technology, USA
[2]Singapore-MIT Alliance for Research and Technology (SMART), Singapore

17:05-17:30 **INVITED TALK 11**
Present and Future of Multi-Junction, Concentrator and Space Solar Cells
Masafumi Yamaguchi
Toyota Technological Institute, Japan

Tuesday, August 10

8:00 - **Registration Desk Open**
2nd Floor, Sapporo Convention Center

Optical Excitation
Chair: George Barbastathis

9:00 - 9:25 **INVITED TALK 5**
Nanobiodevice Based Single Cell Imaging for Cancer Diagnosis and *In Vivo* Imaging for Stem Cell Therapy
Yoshinobu Baba
Nagoya University, Japan

9:25 - 10:40 Tu1-1
Pulsed Laser Triggered High Speed Fluorescence Activated Microfluidic Switch
Ting-Hsiang Wu, Yue Chen, Sung-Young Park, Soojung Claire Hur, Dino Di Carlo, Eric Pei-Yu Chiou
University of California at Los Angeles (UCLA)

Tu1-2
A Laser Driven Optofluidic Device for High-Speed and Precise Volume-Controlled Droplet Generation on Demand
Sung-Yong Park, Ting-Hsiang Wu, Yue Chen, Pei Yu Chiou
University of California at Los Angeles, USA

Tu1-3
Reshaping Gold Micro and Nano Structures with Polarization Dependent Photothermal Annealing
Fan Xiao, Pei Yu Chiou
University of California at Los Angeles, USA

Tu1-4
Near-Field Plasmonic Enhancement via Nanogratings on Hollow Pyramidal Aperture Probe Tip
Yuyan Wang, Yu-Yen Huang, Kazunori Hoshino, Ashwini Gopal, Xiaojing Zhang
University of Texas at Austin, USA

Tu1-5
Surface Optomechanics: Mechanical Whispering Gallery Modes in Microspheres
John Zehnpfennig, Matthew Tomes, Tal Carmon
The University of Michigan, Ann Arbor, USA

Light Beam Control
Chair: Vincent C. Lee

11:10 - 11:35 **INVITED TALK 6**
Silicon Integrated Electronic-Photonic ICs
Patrick Lo, Dim-Lee Kwong
Institute of Microelectronics/A*STAR, Singapore

11:35 - 12:35 Tu2-1
High Power THz Photoconductive Antenna Using Localized Surface Plasmon Resonance
Sang-Gil Park[1], Yongje Choi[1], Minwoo Yi[1], Jun-Hyuk Choi[2], Kyung-Hwan Jin[1], Jong-Chul Ye[1,]
Jaewook Ahn[1], Ki-Hun Jeong[1]
[1]KAIST, Korea
[2]Korea Institute of Machinery & Materials, Korea

Tu2-2
Control of Solid-State Lasers Using an Intra-Cavity MEMS Micro-Mirror
W. Lubeigt, J. Gomes, G. Brown, A. Kelly, V. Savitski, D. Uttamchandani, D. Burns
University of Strathclyde, UK

Tu2-3
Linear MEMS Micromirror Array for UV-NIR Femtosecond Pulse Shaping
Stefan M. Weber[1], Jérôme Extermann[1], Wilfried Noell[2], Fabio Jutzi[2], Sébastien Lani[2], Denis Kiselev[1], Luigi Bonacina[1], Nico F. de Rooij[2], Jean-Pierre Wolf[1]
[1]Université de Genève, Switzerland
[2]EPFL/STI/IMT-NE/SAMLAB, Switzerland

Tu2-4
Tunable Optical Diffusers for High-Power Laser Applications Based on Magnetically Actuated Membranes
Jonathan Masson[1], Andreas Bich[2], Wilfried Noell[1], Reinhard Voelkel[2], Kenneth J. Weible[2], Nico F. de Rooij[1]
[1]Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland,
[2]SUSS MicroOptics SA, Switzerland

Photoelectric Devices and Nanowires
Chair: Xiaoyu Miao

14:00 - 14:25 **INVITED TALK 7**
Plasmonics for Ultrasensitive Biomolecular Nanospectroscopy
Hatice Altug, Ahmet A. Yanik, Ronen Adato, Serap Aksu, Alp Artar, Min Huang
Boston University, USA

14:25 - 15:25 Tu3-1
A Photoelectrophysicial Capacitor with Direct Solar Energy Harvesting and Storage Capability
Chi-Wei Lo, Chensha Li, Hongrui Jiang
University of Wisconsin-Madison, USA

Tu3-2
Remote Switching of Cellular Activity Using Light through Quantum Dots
Katherine Lugo[1], Xiaoyu Miao[1,2], Fred Rieke[1], Lih Y. Lin[1]
[1]University of Washington, USA
[2]Sandia National Laboratories, USA

Tu3-3
Mechanically Tunable Coupled Photonic Crystal Nanocavities
Xiongyeu Chew[1], Guangya Zhou[1], Fook Siong Chau[1], Jie Deng[2], Xiaosong Tang[2], Yee Chong Loke[2]
[1]National University of Singapore, Singapore
[2]Institute of Materials Research and Engineering, Singapore

Tu3-4
Ring-Resonator Reflector with a Waveguide Crossing
Wei Shi, Raha Vafaei, Miguel Ángel Guillén Torres, Nicolas A. F. Jaeger, Lukas Chrostowski
University of British Columbia, Canada

Displays and Gratings
Chair: Jong-Hyun Lee

15:55 - 16:20 **INVITED TALK 8**
A MEMS Digital Microshutter (DMS^{TM}) for Low-Power High Brightness Displays
J. Lodewyk Steyn, Timothy Brosnihan, John Fijol, Jignesh Gandhi, Nesbitt Hagood IV, Mark Halfman, Steve Lewis, Richard Payne, Joyce Wu
Pixtronix Inc., USA

16:20 - 17:20 Tu4-1
Flexible Display System Based on MEMS Fabry-Perot Interferometer
G.Tortissier[1], C.-Y. Lo[2], H. Fujita[1], H. Toshiyoshi[1]
[1]The University of Tokyo, Japan
[2]National Tsing Hua University, Taiwan

Tu4-2
Low Voltage Electrostatic 90° Turning Flap for Reflective MEMS Display
Fabio Jutzi[1], Francois Gueissaz[2], Wilfried Noell[1], Nico F. de Rooij[1]
[1]Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland,
[2]Swatch Group Research & Development Ltd., Switzerland

Tu4-3
GaN Pitch-Variable Grating Fabricated on Si Substrate
H. Sameshima, T. Tanae, F. Hu, K. Hane
Tohoku University, Japan

Tu4-4
Synchronized Laser Scanning of Multiple Beams by MEMS Gratings Integrated with Resonant Frequency Fine Tuning Mechanisms
Yu Du[1,2], Guangya Zhou[1], Kelvin Koon Lin Cheo[1], Qingxin Zhang[2], Hanhua Feng[2], Fook Siong Chau[1]
[1]National University of Singapore
[2]Institute of Microelectronics, Singapore

Wednesday, August 11

8:00 - **Registration Desk Open**
2nd Floor, Sapporo Convention Center

Microlenses
Chair: Hongrui Jiang

9:00 - 9:25 **INVITED TALK 9**
Fluorometric Bio-Sniffer (Biochemical Gas Sensor) with UV-LED Light for Fomaldehyde Vapor as VOC (Volatile Organic Chemical)
Tomoko Gessei[1,2], Gen Itabashi[1], Yuki Suzuki[1], Daishi Takahashi[1], Takahiro Arakawa[1], Hiroyuki Kudo[1] and Kohji Mitsubayashi[1]
[1]Tokyo Medical and Dental University, Japan
[2]Tokyo Metropolitan Industrial Technology Research Institute, Japan

9:25 - 10:40 W1-1
High-Precision Optical & Fluidic Micro-Bench for Endoscopic Imaging
Niklas Weber, Hans Zappe, and Andreas Seifert
University of Freiburg, Germany

W1-2
A Fully Integrated Thermo-Pneumatic Tunable Microlens
Wei Zhang, Khaled Aljasem, Hans Zappe, Andreas Seifert
University of Freiburg, Germany

W1-3
A Tunable Liquid Lens with Extended Depth of Focus
[1,2]Jingran Kang, [1]Guangya Zhou, [1]Hongbin Yu, [1]Fook Siong Chau, [2]Haiqing Chen
[1]National University of Singapore, Singapore
[2]Huazhong Univerisity of Science and Techonolgy, China

W1-4
Micromachined Two Dimensional Lens Scanner with Large Aperture Beam
Hyeon-Cheol Park, Cheol Song, Ki-Hun Jeong
Korea Advanced Institute of Science and Technology (KAIST), Korea

W1-5
Large-Size Infrared Reflow Microlens Based on Stacked Layers
Takuro Aonuma, Shinya Kumagai, Minoru Sasaki
Toyota Technological Institute, Japan

Phase Modulator
Chair: Hakan Urey

11:10 - 11:35 **INVITED TALK 10**
Optical Waveguide Devices for Bioanalysis
James S. Wilkinson
University of Southampton, UK

11:35 - 12:35 W2-1
Submicron Silicon Waveguide Mach-Zehnder Interferometer Using Micro Electro-Mechanical Phase-Shifter
T. Ikeda, Y. Kanamori, K. Hane
Tohoku University, Japan

W2-2
MEMS-Actuated Waveguide Phase Modulators
Chun-Che Chang[1], Wei-Chao Chiu[1], Jiun-Ming Wu[1], Ming-Chang M. Lee[1], Jia-Min Shieh[2]
[1]National Tsing Hua University, Taiwan
[2]National Nano Device Laboratories, Taiwan

W2-3
Inertial Force Sensor Using Optical Mach-Zehnder Interferometer and Multi Mode Interferometer
Masato Suzuki[1], Gou Kawai[1], Kouji Nishioka[1], Tomokazu Takahashi[1], Seiji Aoyagi[1], Yoshiteru Amemiya[2], Masataka Fukuyama[2], Shin Yokoyama[2]
[1]Kansai University, Japan
[2]Hiroshima University, Japan

W2-4
Pure Piston Motion of Optically Flat Micromirrors in a Fully Programmable Micro Diffraction Grating
R. Lockhart, R.P. Stanley, M. Tormen
CSEM SA (Swiss Center of Electronics and Microtechnology), Switzerland

14:00 - 16:00 **Poster Session**
Chairs: J. Andrew Yeh and Xiaojing Zhang

Optical MEMS Posters

PO-1
Lamellar Grating Based MEMS Fourier Transform Spectrometer
Hüseyin R. Seren[1], N. Pelin Ayerden[1], Jaibir Sharma[1], Sven TS Holmström[1], Thilo Sandner[2], Thomas Grasshoff[2], Harald Schenk[2], Hakan Urey[1]
[1]Koç University, Turkey
[2]Fraunhofer Institute for Photonic Microsystems (IPMS), Germany

PO-2
A Study on Color-tunable MEMS Device Based on Plasmon Photonics
Taelim Lee, Akio Higo, Hiroyuki Fujita, Yoshiaki Nakano, Hiroshi Toshiyoshi
The University of Tokyo

PO-3
A Mixed-Signal Analysis for Tilted MEMS Torsion Mirror Devices
Satoshi Maruyama[1], Akio Higo[1], M. Nakada[1], K. Takahashi[2], T. Takahashi[1], M. Mita[3], Hiroyuki Fujita[1], Yoshiaki Nakano[1], Hiroshi Toshiyoshi[1]
[1]The University of Tokyo
[2]Toyohashi University of Technology
[3]Japan Aerospace Exploration Agency

PO-4
A 2-axis MEMS Scanner for the Landing Laser Radar of the Space Explorer
M. Mita[1], T. Mizuno[1], M. Ataka[2], H. Toshiyoshi[2]
[1]ISAS/JAXA
[2]University of Tokyo, Japan

PO-5
Vacuum Operation Characteristics of Two-Dimensional Micro-Mirror
Hoang Manh Chu, Kazuhiro Hane
Tohoku University, Japan

PO-6
A Two-Axis Hybrid MEMS Scanner Incorporating Electrothermal and Electrostatic Actuators
Gordon Brown, Li Li, Ralf Bauer, Jinsong Liu, Deepak Uttamchandani
University of Strathclyde, UK

PO-7
MEMS Scanning Mirror Used as a Laser External Modulator for Photoacoustic Spectroscopy
Li Li, Graham Thursby, George Stewart, Deepak Uttamchandani,
University of Strathclyde, UK

PO-8
Torsional Mirror Driven by a Cantilever Beam Integrated with 1x10 Individually Biased PZT Array Actuator for VOA Application
Kah How Koh[1], Takeshi Kobayashi[2], Chengkuo Lee[11]
[1]National University of Singapore, Singapore
[2]National Institute of Advanced Industrial Science and Technology (AIST), Japan

PO-9
Design, Fabrication, and Package of MEMS-Based Image Stabilizer for Photographic Cell Phone Applications
Jin Chern Chiou[1,2], Chen-Chun Hung[1], Chun-Ying Lin[1]
[1]National Chiao Tung University, Taiwan,
[2]China Medical University, Taiwan

PO-10
Development of a 2x2 Optical Switch
Using Bi-stable Solenoid-Based Actuators
Bonnie Tingting Chia, Cheng-Wen Ma, Bo-Ting Liao, Sun-Chih Shih, Yao-Joe Yang
National Taiwan University, Taiwan

PO-11
Fabrication and Evaluation of Piezoelectric Drive Type 2-Axis Tilt Control Device Using Epitaxial PZT Thin Film
Katsuya Ozaki, Daisuke Akai, Kazuaki Sawada, Makoto Ishida
Toyohashi University of Technology, Japan

PO-12
Compliant Scanning Micromirror Actuated with a Displacement Amplification Mechanism
Tzung-Ming Chen[1,2], Florian Schneider[1], Ulrike Wallrabe[1]
[1]University of Freiburg, Germany
[2]Changhua University of Education, Taiwan

PO-13
Multilayer Piezoelectric Ceramic Actuator for Laser Scanner
Jae-Sung Song, In-Sung Kim, Soon-Jong Jeong, Min Soo Kim
Korea Electrotechnology Research Institute, Korea

PO-14
Droplet-Based Lateral Tunable Optofluidic Microlens Array with Pneumatic Control
Ye Liu, Hongrui Jiang
University of Wisconsin at Madison, USA

PO-17
Excellent Fault Tolerance of a MEMS Optically Differential Reconfigurable Gate Array
Hironobu Morita, Minoru Watanabe
Shizuoka University, Japan

PO-18
Batch Fabrication of Flowable Colorimetric Pressure Sensing Particles via Surface Micromachining
S. Chalasani, Y. Xie, Y. Zeng, C. H. Mastrangelo
University of Utah, USA

PO-19
Enhanced Contrast of Wavelength Selective Mid-IR Detector Stable Against Temperature Change
Katsuya Masuno[1,] Shinya Kumagai[1], Kohji Tashiro[1], Masaru Hori[2] and Minoru Sasaki[1]
[1]Toyota Technological Institute
[2]Nagoya University, Japan

PO-20
Fabrication and Verification for the Micro Holographic Optical Pickup
Jin Chern Chiou[1,2], Kuan Chou Hou[1]
[1]National Chiao Tung University, Taiwan
[2]China Medical University, Taiwan

PO-21
A Novel Fabrication Method of the Micro Cube Beam-Splitter with Optical Surface Roughness
Kuo-Yung Hung[1], Ying-Chuan Chen[1], Shih-Hao Huang[2], Yun-Ju Chuang[3]
[1]Ming Chi University of Technology, Taiwan
[2]Taiwan Ocean University, Taiwan
[3]Ming Chuan University, Taiwan

PO-22
Dynamic Trapping and Release of Multiple Particles in a Polarized Optical Vortex
Baile Zhang, George Barbastathis
Singapore-MIT Alliance for Research and Technology Centre, Singapore and
Massachusetts Institute of Technology, USA

PO-23
Design and Fabrication of Large Fiber-Mode-Matched Three-Dimensional Adiabatic Tapered Couplers for Integrated Optics
Chun-Wei Liao[1], Yao-Tsu Yang[1], Sheng-Wen Huang[1], Ming-Chang M. Lee[1]
Pi-Yao Lin[2], Chao-Min Chou[2], Jia-Ming Shieh[2]
[1]National Tsing Hua University, Taiwan
[2]National Nano Device Laboratories, Taiwan

PO-24
Fabrication of LED Based Ultra Slim Optical Pointing Device
Jae Young Joo[1], Do-Kyun Woo[1], Sun Sub Park[2], Sun-Kyu Lee[1]
[1]Gwangju Institute of Science and Technology, Korea,
[2]Korea Institute of Industrial Technology, Korea

PO-25
Fast Atom Beam-Based Fabrication of High-Efficient Blazed Grating Using Slanting Angle Control of a Substrate
ChaBum Lee[1], Kazuhiro Hane[2], Sun-Kyu Lee[1]
[1]Gwangju Institute of Science and Technology, Korea
[2]Tohoku University, Japan

PO-26
X-Ray Imaging Test for a Single-Stage MEMS X-Ray Optical System
Ikuyuki Mitsuishi[1], Yuichiro Ezoe[2], Kensuke Ishizu[2], Teppei Moriyama[2], Yoshitomo Maeda[1], Takayuki Hayashi[2], Takuro Sato[2], Makoto Mita[1], N Y. Yamasaki[1], K. Mitsuda[1], Mitsuhiro Horade[3], Susumu Sugiyama[3], Raul E. Riveros[4], Taylor Boggs[4], Hitomi Yamaguchi[4], Yoshiaki Kanamori[5], Kohei Morishita[6], Kazuo Nakajima[6], Ryutaro Maeda[7]
[1]Institute of Space and Astronautical Science (ISAS), Japan Aerospace Exploration Agency (JAXA), Japan,
[2]Tokyo Metropolitan University, Japan
[3]Ritsumeikan University, Japan
[4]University of Florida, USA
[5]Tohoku University, Japan
[6]Kyoto Univeristy, Japan
[7]AIST, Japan

PO-27
Improvement of GaN Crystalline Quality on Nanoscale Patterned Sapphire Substrates
Yu-Sheng Lin, J. Andrew Yeh
National Tsing Hua University, Taiwan,

PO-28
The Morphological Control of MEH-PPV Films on an ITO Electrode for Hybrid Solar Cell Fabrication
Quynh Nhu Nguyen Truong, N. T. N. Truong, C. Park, Jae Hak Jung
Yeungnam University, Korea

PO-29
Photonic MEMS Vibrating at X-Band Rates (11 GHz)
Matthew Tomes, Tal Carmon
University of Michigan, USA

PO-30
Gyroscopic Optomechanics
Xingyu Zhang, Matthew Tomes, Tal Carmon
University of Michigan, Ann Arbor, USA

PO-31
Measurements of Light Fields Emerging from Fine Amplitude Gratings
Myun-Sik Kim, Toralf Scharf, Hans Peter Herzig
Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Nanophotonics Posters

PN-1
Nanoscale Epitaxial Growth of GaN on Freestanding Circular GaN Grating
Yongjin Wang, Fangren Hu, Kazuhiro Hane
Tohoku University, Japan

PN-2
Preparation of Anodic Aluminum Oxide Nano-Template Using Al/Si Substrate for Large Area LED Applications
Lan Shen[1], Doogwook Kim[1], Bonggi Min[1], Zhengbin Gu[2], Chinho Park[1]
[1]Yeungnam University, Korea
[2]Nanjing University, China

PN-3
Polarization Control of InAs Quantum Dot Semiconductor Laser Using External Light Injection Technique
P. C. Peng[1], R. L. Lan[1], S. T. Hsu[1], H. H. Lu[1], G. Lin[2], H. C. Kuo[2], G. R. Lin[3], J. Y. Chi[4]
[1]National Taipei University of Technology, Taiwan
[2]National Chiao Tung University, Hsinchu, Taiwan
[3]NationalTaiwan University, Taipei, Taiwan
[4]National Dong Hwa University, Taiwan

PN-4
Experimental Demonstration of the Vernier Effect Using Series-Coupled Racetrack Resonators
Robi Boeck, Nicolas A. F. Jaeger, Lukas Chrostowski
University of British Columbia, Canada

PN-5
Polarization Independent Grating Coupler for Silicon-on-Insulator Waveguides
Chun-Chia Chiu and Ding-Wei Huang
National Taiwan University, Taiwan

PN-6
An Approach for Modeling Photonic Crystal Circuits
Yih-Bin Lin[1], Rei-Shin Chen[1], Ju-Feng Liu[2], and Han-Bin Lin[1]
[1]Lunghwa University of Science and Technology, Taiwan
[2]China University of Science and Technology, Taiwan

PN-7
Design of High Transmission Broadband 90-Degree Bends for Two Dimensional Cubic Photonic Crystals
Yih-Bin Lin[1], Cheng-Ru Li[1], Rei-Shin Chen[1], Jung-Young Su[2]
[1]Lunghwa University of Science and Technology, Taiwan
[2]Ta-Hwa Institute of Technology, Taiwan

16:15 - **Excursion and Conference Dinner**
*Pirka Kotan Ainu Museum & Art Center (Sapporo Ainu Culture Promotion Center)
*Sapporo Beer Garden (Dinner)
Bus departs convention center at 16:15. Drop you off at station/downtown area after the dinner.

Thursday, August 12

8:00 - **Registration Desk Open**
2nd Floor, Sapporo Convention Center

Subwavelength Photonic Structures and Metamaterials
Chair: Hon K. Tsang

9:10- 10:25 Th1-1
Design and Fabrication of Dielectric Nanostructured Luneburg Lens in Optical Frequencies
Satoshi Takahashi, Chih-hao Chang, Se Young Yang, George Barbastathis
Massachusetts Institute of Technology, USA

Th1-2
Nonlinear Kerr Effect Aperiodic Lüneburg Lens
Hanhong Gao, Satoshi Takahashi, Lei Tian, George Barbastathis
Massachusetts Institute of Technology, U.S.A.

Th1-3
Configuration Analysis of Sensing Element For Microcantilever Sensor Using Dual Nano-Ring Resonator
Bo Li[1], Fu-Li Hsiao[1,2], Chengkuo Lee[1]
[1]National University of Singapore, Singapore
[2]National Changhua University of Education, Taiwan

Th1-4
Investigation of Strain Sensitivity of Photonic Crystal Nanocavity for Mechanical Sensing
Bui Thanh Tung, Dzung Viet Dao, Susumu Sugiyama
Ritsumeikan University, Japan

Th1-5
Magnetic Response of Continuous Split Ring Structures at Visible Frequencies
Yi-Hao Chen, Alex F. Kaplan, L. Jay Guo
The University of Michigan, Ann Arbor, USA

Special Environments
Chair: Hiroshi Miyajima

11:55 - 11:20 **INVITED TALK 12**
Commercialization of Self-Assembled Quantum-Dot Lasers: From Optical Communication to Consumer Electronics
Mitsuru Sugawara
QD Laser, Inc. Japan

11:20 - 12:35 Th2-1
An Adaptive Objective for Optical Motion Correction in MRI
F. Schneider[1], J. Draheim[1], T. Burger[1], J. Maclaren[2], M. Herbst[2], M. Zaitsev[2], R. Bammer[3,4], U. Wallrabe[1,4]
[1]University of Freiburg – IMTEK, Germany
[2]University Hospital Freiburg, Germany
[3]Stanford University, USA
[4]University of Freiburg, Germany

Th2-2
MEMS-Based X-Ray Optics for Future Astronomical Missions
Yuichiro Ezoe[1], Ikuyuki Mitsuishi[2], Kensuke Ishizu[1], Teppei Moriyama[1], Kazuhisa Mitsuda[2], Noriko Y. Yamasaki[2], Takaya Ohashi[1], Mitsuhiro Horade[3], Susumu Sugiyama[3], Raul E. Riveros[4], Taylor Boggs[4], Hitomi Yamaguchi[4], Yoshiaki Kanamori[5], Nicholas T. Gabriel[6], Joseph J. Talghader[6], Kohei Morishita[7], Kazuo Nakajima[7], Ryutaro Maeda[8]
[1]Tokyo Metropolitan University, Japan
[2]ISAS/JAXA, Japan
[3]Ritsumeikan University, Japan
[4]University of Florida, US
[5]Tohoku University, Japan
[6]University of Minnesota, US,
[7]Kyoto University, Japan
[8]AIST, Japan

Th2-3
Large Electrostatically and Electromagnetically Actuated Mirror System for Space Applications
Dara Bayat[1], Caglar Ataman[1], Benedikt Guldimann[2], Sebastian Lani[1], Wilfried Noell[1], Nico F. de Rooij[1]
[1]Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
[2]European Space Agency (ESA-ESTEC), The Netherlands

Th2-4
Micromirror Arrays Designed and Tested for Space Instrumentation
Frederic Zamkotsian[1], Michael Canonica[2], Kyrre Tangen[3], Patrick Lanzoni[1], Emmanuel Grassi[1], Rudy Barette[1], Christophe Fabron[1], Severin Waldis[2], Wilfried Noell[2], Nico de Rooij[2], Laurent Marchand[4], Ludovic Duvet[4]
[1]Laboratoire d'Astrophysique de Marseille, CNRS, France
[2]Ecole Polytechnique Fédérale de Lausanne, Switzerland
[3]Visitech, Norway
[4]European Space Agency, The Netherlands

M4-4
Absorbent Liquid Immersion Angled Exposure for 3D Photolithography
Hironori Kubo, Shinya Kumagai, Minoru Sasaki
Toyota Technological Institute, Japan