

PROCEEDINGS OF SPIE

International Conference on Optical and Photonic Engineering (icOPEN 2015)

**Anand K. Asundi
Yu Fu**
Editors

**14–16 April 2015
Singapore**

Organized by
Optics and Photonics Society of Singapore
Centre for Optical and Laser Engineering, Nanyang Technological University (Singapore)

Sponsored by
ESUN • KLA-Tencor (United States) • Coherent (United States) • Physik Instrumente GmbH & Company
KG (Germany) • Precision Optical Systems Singapore Pte Ltd. • Wavelength Opto-Electronic Pte Ltd.
(Singapore) • International Commission for Optics • SPIE • d'optron Pte Ltd. (Singapore)

Supporting Organizations
Automatic Optical Inspection Equipment Association (Taiwan) • Chinese Laser Press • CIS PES (China) •
The International Committee on Measurements and Instrumentation (Hong Kong, China) • Indonesian
Optical Society

Published by
SPIE

Volume 9524

Proceedings of SPIE 0277-786X, V. 9524

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

International Conference on Optical and Photonic Engineering (icOPEN 2015), edited by Anand K. Asundi, Yu Fu,
Proc. of SPIE Vol. 9524, 952401 · © 2015 SPIE · CCC code: 0277-786X/15/\$18 · doi: 10.1117/12.2206016

Proc. of SPIE Vol. 9524 952401-1

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *International Conference on Optical and Photonic Engineering (icOPEN 2015)*, edited by Anand K. Asundi, Yu Fu, Proceedings of SPIE Vol. 9524 (SPIE, Bellingham, WA, 2015) Article CID Number.

ISSN: 0277-786X

ISBN: 9781628416848

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2015, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/15/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.



SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print. Papers are published as they are submitted and meet publication criteria. A unique citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID Number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages.

Contents

- ix *Authors*
- xiii *Conference Committee*
- xv *Introduction*

INTERNATIONAL CONFERENCE ON OPTICAL AND PHOTONIC ENGINEERING (ICOPEN 2015)

- 9524 02 **Automatic optical inspection method for soft contact lenses [9524-3]**
- 9524 03 **Precision optical metrology without lasers (Invited Paper) [9524-5]**
- 9524 04 **Fabrication of two-dimensional micro patterns for adaptive optics by using laser interference lithography (Invited Paper) [9524-11]**
- 9524 05 **Phase space optics: applications in computational imaging and optical image processing (Invited Paper) [9524-13]**
- 9524 06 **Electron beam evaporation induced discoloration of reflective film on InGaN/sapphire in III-V LED TFFC device manufacturing [9524-16]**
- 9524 07 **In-process deformation measurements of translucent high speed fibre-reinforced disc rotors (Invited Paper) [9524-18]**
- 9524 08 **Autonomous space object tracking and azimuth determination using star tracker technique under complex space environment [9524-23]**
- 9524 09 **A carrier removal approach for fringe projection profilometry using principal component analysis [9524-24]**
- 9524 0A **Experimental study on the measurement of convex hyperbolic mirrors with Hindle and stitching methods [9524-25]**
- 9524 0B **Influence of quantized diffractive phase element on the axial uniformity of pseudo-nondiffracting beams [9524-27]**
- 9524 0C **White light single-shot interferometry with colour CCD camera for optical inspection of microsystems [9524-29]**
- 9524 0D **Accuracy assessment of Procrustes analysis for computing mid-sagittal plane of three-dimensional facial data [9524-32]**
- 9524 0E **Analysis of the performance of temperature compensation for fiber Bragg grating strain sensor [9524-33]**
- 9524 0F **Improvement of the pad wear shape in fixed abrasive chemical-mechanical polishing for manufacturing optical components [9524-35]**

- 9524 OG **High speed photoacoustic tomography system with low cost portable pulsed diode laser** [9524-41]
- 9524 OH **Method for traceable resolution calibration of the laser feedback displacement sensor** [9524-40]
- 9524 OI **Deformation measurement of carbon fiber reinforced plastics using phase-shifting scanning electron microscope Moiré method after Fourier transform (Invited Paper)** [9524-43]
- 9524 OJ **Zero-phase locking for phase-shifted dithering techniques** [9524-50]
- 9524 OK **Adaptive interferometric velocity measurements using a laser guide star (Invited Paper)** [9524-52]
- 9524 OL **Measurement of thermal expansion coefficients of materials based on Nd:YVO₄ laser feedback systems** [9524-56]
- 9524 OM **Experimental demonstrations of retinal recognition using compression-based joint transform correlator** [9524-57]
- 9524 ON **Monitoring of non-uniform strains and progressive damage in honeycomb skin by complex Bragg reflection spectrum analysis** [9524-65]
- 9524 OO **An improved study of locality sensitive discriminant analysis for object recognition** [9524-66]
- 9524 OP **The design and fabrication of common optical components lithography lens** [9524-69]
- 9524 OQ **Optical fiber spectral attenuation measurement by using tunable laser sources to improve accuracy and uncertainty** [9524-70]
- 9524 OR **Design and simulation of the active support system for a 1.2m meniscus primary mirror** [9524-72]
- 9524 OS **Mode division multiplexing of spiral-phased donut modes in multimode fiber** [9524-73]
- 9524 OT **Optimization study on the primary mirror lightweighting of a remote sensing instrument** [9524-77]
- 9524 OU **Deep imaging with low-cost photoacoustic tomography system with pulsed diode laser (Invited Paper)** [9524-82]
- 9524 OV **An index of beam hardening artifact for two-dimensional cone-beam CT tomographic images: establishment and preliminary evaluation** [9524-88]
- 9524 OW **Measurement of the glucose concentration in human urine with optical refractometer** [9524-94]
- 9524 OX **To develop a flying fish egg inspection system by a digital imaging base system** [9524-99]

- 9524 0Y **An optimization of Raman effects in tandem-pumped Yb-doped kilowatt fiber amplifiers** [9524-100]
- 9524 0Z **Tunable fiber confocal sensor with LED** [9524-108]
- 9524 10 **Speckle suppression in holographic displays using temporal averaging effect combined with rotating symmetric diffuser** [9524-106]
- 9524 11 **k-Wave simulation to understand the photoacoustic signal characteristics from various shapes of nanoparticles** [9524-109]
- 9524 12 **Measurement of the shape of objects by shape from focus** [9524-113]
- 9524 13 **Optimum defocus planes selection method for transport of intensity phase imaging based on phase transfer function** [9524-115]
- 9524 14 **High linearly polarized light emission from GaN-based LED with patterned dielectric/metal structures** [9524-120]
- 9524 15 **Evaluation of the correctness of a 3D recording device for mandibular functional movement in laboratory** [9524-127]
- 9524 16 **Real-time multi-point diffraction-based imaging system (ReMuDis) for strain measurement** [9524-129]
- 9524 17 **A novel absolute measurement for the low-frequency figure correction of aspheric surfaces (Invited Paper)** [9524-134]
- 9524 18 **The optical design of ultra-short throw system for panel emitted theater video system** [9524-138]
- 9524 19 **Ghost-secured imaging via pixel modulation of one phase-only mask** [9524-139]
- 9524 1A **High power 355 nm diode-pumped solid-state laser** [9524-140]
- 9524 1B **Ultrathin zoom lens system based on liquid lenses** [9524-143]
- 9524 1C **Digital off-axis holography with angular multiplexing and synthetic aperture** [9524-145]
- 9524 1D **A high resolution spectrum reconstruction algorithm using compressive sensing theory** [9524-147]
- 9524 1E **Wavefront subaperture stitching with Shack-Hartmann sensor** [9524-148]
- 9524 1F **The study of quantum remote sensing principle prototype (Invited Paper)** [9524-149]
- 9524 1G **The role of the optimization process in illumination design (Invited Paper)** [9524-151]
- 9524 1H **Surface deformation monitoring and reconstruction of honeycomb structure based on FBG sensors** [9524-150]

- 9524 1I **Comparison of optical characteristics according to shape change based on micro prism pattern** [9524-154]
- 9524 1J ***In-vivo* high resolution corneal imaging and analysis on animal models for clinical applications** [9524-155]
- 9524 1K **Quantitative evaluation of three-dimensional facial scanners measurement accuracy for facial deformity** [9524-159]
- 9524 1L **Dual-illumination mode, wide-field probe imaging scheme for imaging irido-corneal angle region inside eye** [9524-166]
- 9524 1M **Evaluation of resolution performance of high energy x-ray CT** [9524-167]
- 9524 1N **Non-contact large-scale separated surfaces flatness measurement by using laser beam and laser distance sensor** [9524-168]
- 9524 1O **3D scanning modeling method application in ancient city reconstruction** [9524-193]
- 9524 1P **Lensless transport-of-intensity phase microscopy and tomography with a color LED matrix (Invited Paper)** [9524-170]
- 9524 1Q **A novel interferometric technique to estimate thermal diffusivity of optically transparent solid using isothermal surface velocimetry** [9524-171]
- 9524 1R **Design and fabrication of nano-scale single crystal diamond cutting tool by focused ion beam (FIB) milling** [9524-175]
- 9524 1S **EUV generation by plasmonic field enhancement using nanostructures** [9524-177]
- 9524 1T **A primary study of appropriate intraoral scanning frequency of single 3D image** [9524-183]
- 9524 1U **Plasmon coupled 2D random medium for enhanced absorption in solar cells** [9524-184]
- 9524 1V **Study on formation mechanism of periodic ripple on finished KDP crystal in cutting process** [9524-186]
- 9524 1W **Effects of various diffuser plates on illumination uniformity for reflective LED module** [9524-188]
- 9524 1X **A portable inspection system to estimate direct glare of various LED modules** [9524-190]
- 9524 1Y **Liquid sensor based bio-chip for DNA analysis of cancer using photonic crystal** [9524-194]
- 9524 1Z **A GPU-based approach to compute the brain shift using a fully nonlinear biomechanical model** [9524-197]
- 9524 20 **A 3D modeling and measurement system for cultural heritage preservation** [9524-201]
- 9524 21 **Optical super-resolution methodology for 3D full field surface profilometry to reconstruction of micro gratings** [9524-203]

- 9524 22 **Shape measurement of micro-objects using a common-path digital holographic microscopy (CDHM) with dual wavelength** [9524-204]
- 9524 23 **WFF-BM3D: a hybrid denoising scheme for fringe patterns** [9524-205]
- 9524 24 **A quantitative phase imaging system based on transport-of-intensity equation** [9524-207]
- 9524 25 **Multi-view 3D display using waveguides (Invited Paper)** [9524-208]
- 9524 26 **A compact and lensless digital holographic microscope setup** [9524-215]
- 9524 27 **Analysis on the magnetic sensitivity in a total reflection prisms (TRP) ring resonator** [9524-216]
- 9524 28 **3D optical see-through head-mounted display based augmented reality system and its application (Invited Paper)** [9524-218]
- 9524 29 **Probabilistic reasoning for repeatability detection from urban facade image** [9524-220]
- 9524 2A **Comparison of two methods for short circuit current measurement of large size solar cell** [9524-221]
- 9524 2B **Photosensitivity study of GeS₂ chalcogenide glass under femtosecond laser pulses irradiation** [9524-223]
- 9524 2C **Coded multi-angular illumination for Fourier ptychography based on Hadamard codes** [9524-224]
- 9524 2D **Non-invasive pressure monitoring by hoop strain using fiber Bragg grating sensor** [9524-227]
- 9524 2E **Gallium arsenide based surface plasmon resonance for glucose monitoring** [9524-229]
- 9524 2F **Variable resolution imaging fiber probe using digital spatial light modulator** [9524-230]
- 9524 2G **GPU-assisted real-time three dimensional shape measurement by speckle-embedded fringe** [9524-237]
- 9524 2H **Free-space optical mode division multiplexing for switching between millimeter-wave picocells** [9524-239]
- 9524 2I **Instrumentation challenges of a pushbroom hyperspectral imaging system for currency counterfeit applications** [9524-241]
- 9524 2J **Quantitative phase measurement for wafer-level optics** [9524-242]
- 9524 2K **Imaging quality analysis of computer generated holograms in 3D holographic display using different Fresnel zone plates in look-up table** [9524-254]
- 9524 2L **Quantification of biofilm thickness using a swept source based optical coherence tomography system** [9524-260]

- 9524 2M **Three-dimensional imaging of microstructures by an improved compact digital holographic microscope (ICDHM) with dual wavelength** [9524-264]
- 9524 2N **Simultaneous in-plane and out-of-plane displacement measurement based on a dual-camera imaging system and its application to inspection of large-scale space structures (Invited Paper)** [9524-267]
- 9524 2O **High photon flux XUV and soft x-ray sources enabled by high harmonic generation of high power fiber lasers (Invited Paper)** [9524-272]
- 9524 2P **Speckle referencing: digital speckle pattern interferometry (SR-DSPI) for imaging of non-diffusive surfaces** [9524-275]
- 9524 2Q **A flexible image fiber probe based speckle imaging for extraction of surface features with possible application in intra-cavity inspection** [9524-274]
- 9524 2R **Optical frequency domain imaging with a rapidly swept laser in the 1300nm bio-imaging window** [9524-279]
- 9524 2S **Diffusion between glass and metals for optical fiber preform extrusion** [9524-283]
- 9524 2T **Phase shift reflectometry for wafer inspection** [9524-285]
- 9524 2U **Extreme ultraviolet light sources and soft x-ray laser based on discharge produced plasma (Invited Paper)** [9524-292]
- 9524 2V **Research on super-resolution image reconstruction based on an improved POCS algorithm (Invited Paper)** [9524-291]
- 9524 2W **Contour detect in the medical image by shearlet transform** [9524-244]

Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

A. S., Guru Prasad, 2Q
Abe, Makoto, 1M
Aihara, Ryo, 04
Amphawan, Angela, 0S, 2H
Asundi, Anand Krishna, 1C, 1E, 2M, 2T
Aung, Tin, 1J, 1L
Ayiriveefil, Arunbabu, 2B
Baek, Seung-Yub, 1R
Baskaran, M., 1L
Bergmann, Ralf B., 03
Bi, Chao, 27
Bi, Siwen, 1F
Bian, Kan, 0N
Bingi, Jayachandra, 1U
Bourgade, Thomas, 1E, 2T
Burke, Jan, 03
Büttner, L., 0K
Byrne, David J., 1G
Cadena, Franklin, 2W
Cadena, Luis, 2W
Cai, Yindi, 04
Cao, Bing, 14
Cao, Yiping, 2T
Chai, Chun Hoo, 06
Chan, Chia-Yen, 0T
Chan, Kelvin H. K., 2P, 2Q
Chang, Chun-Li, 02, 0B
Chang, Shenq-Tsong, 17
Chaudhary, Sushank, 2H
Chaw, Kam Hoe, 06
Chen, Chien Hung, 0X
Chen, Chun-Jen, 0X
Chen, Han-Ting, 1W, 1X
Chen, Liang-Chia, 21
Chen, Po-Li, 1W, 1X
Chen, Qian, 09, 13, 1P, 26, 2C, 2G
Chen, Wen, 19
Chen, Xudong, 19
Chen, Yi-Cheng, 0T
Cheng, Chee Yuen, 1A, 22
Cheng, Chih-Ching, 0W
Cheng, Haobo, 2M
Cheng, Pi-Ying, 0Z
Choi, Hwan-Jin, 1I
Chu, Nien-Nan, 0Z
Chung, Chien-Kai, 17
Czarske, Jürgen, 07, 0K
Dai, Junfei, 0J
Ding, Yingchun, 0H, 0L, 0Y
Du, Guoguang, 1O, 20
Espinosa, Nikolai, 2W
Falldorf, Claas, 03
Fan, Bin, 0A, 0R
Fan, Bo, 1N
Fan, Kuang-Chao, 21
Fazea, Yousef, 0S
Feng, Guoying, 1E
Feng, Shijie, 09, 2C, 2G
Feng, Shuqing, 1D
Filippatos, Angelos, 07
Fischer, Andreas, 07
Fujimoto, Hiroyuki, 1M
G., Sriram, 2E
Gao, Hongyue, 10, 2K
Gao, Wei, 04
Gauvin, Michael A., 1G
Gong, Wupeng, 0Y
Hädrich, Steffen, 2O
Han, Seunghwoi, 1S
Hayashi, Yasushi, 2U
He, Yuzhu, 0O
Ho, Cheng-Fang, 17
Hoang, Hai Hong, 21
Hong, Jesmond, 1J, 1L
Hotta, Eiki, 2U
Hou, Xi, 0A
Hsieh, Tung-Hsien, 0X
Hsu, Cheng-Chih, 0W
Hsu, Wei-Yao, 17
Hu, Jingpei, 14
Hu, Yan, 1P, 26, 2C
Huang, Bin, 2U
Huang, Bo-Kai, 0T
Huang, Chien-Yao, 0Z
Huang, Jiun-Woei, 0P, 18
Huang, Lei, 2J
Huang, Ting-Ming, 0T
Huang, Xuebo, 2A
Hwang, Chi-Chun, 02
Hwang, Chi-Hung, 0Z
Ibrahim, Huda, 0S
Ito, So, 04
Jacobsen, David, 1G
Je, Tae-Jin, 1I
Jeon, Eun-chaе, 1I
Jia, Limin, 0E
Jiang, Hongzhi, 1N
Jo, Byeong-Muk, 1I

Jou, Shyh-Jye, 1X
 Jywe, Wenyuh, 0X
 Kaewphaluk, Komin, 0M
 Kagawa, Yutaka, 0I
 Kang, Myoung-Chang, 1I
 Kar, Ajoy K., 2B
 Kim, Chang-Eui, 1I
 Kim, Hyunwoong, 1S
 Kim, Seung-Woo, 1S
 Kim, Young-Jin, 1S
 Kishimoto, Satoshi, 0I
 Kng, Jerald, 2A
 Kothiyal, Mahendra Prasad, 0C
 Koukourakis, Nektarios, 07
 Krebs, Manuel, 2O
 Kulikov, Rodion V., 2I
 Kumar Chakkathara Janardhanan Nair, Dileep,
 2S
 Kuo, Ching-Hsiang, 17
 Kuo, Hui-Jean, 1W, 1X
 Kuschmierz, Robert, 07
 L., Kameswara Rao, 1Q
 Lan, Tzu-Hsien, 0Z
 Langkamp, Albert, 07
 Lee, Bong-Jae, 1I
 Lee, Byounggho, 25
 Lee, Chang-Kun, 25
 Lee, Tsung-Xian, 1W, 1X
 Lei, Baiping, 0A
 Leithold, Christoph, 07
 Li, Dong, 27
 Li, Hong, 1T
 Li, Hongru, 1E, 2T
 Li, Hung-Chung, 1X
 Li, Lei, 1B
 Li, Xiaojin, 0R
 Li, Xinghui, 04
 Li, Xudong, 1N
 Lian, Yongjian, 29
 Liang, Dakai, 0N, 1D
 Liang, Xiaoyue, 1T
 Liao, Chun-Hsiang, 1W, 1X
 Liao, Yu-Ching, 0W
 Lim, Hoong-Ta, 2I
 Limpert, Jens, 2O
 Lin, Jing, 0L
 Lin, Shyh-Tsong, 2I
 Lin, Wei-Cheng, 17
 Lin, Yu-Hsin, 1W, 1X
 Liu, Chao, 1B
 Liu, Haitao, 0R
 Liu, Liu, 0O
 Liu, Rong, 0R
 Liu, Shulin, 0N, 1D, 1H
 Liu, Yue, 28
 Liu, Zhongxuan, 0Y
 Lu, Jiyun, 0N, 1H
 Lv, Peijun, 0V
 Lyu, Pei-jun, 1K, 1T
 M., Baskaran, 1J
 Meleppat, Ratheesh Kumar, 2L, 2R
 Meng, Ching-Tang, 0W
 Meng, Fanyong, 0E
 Miao, Hong, 2V
 N. C., Shivaprakash, 1Q
 Nandigana, Krishna Mohan, 0C
 Neelakandan, Sivanantham, 06
 Nguyen, N. Y., 0F
 Niimi, Gohta, 2U
 Park, Min-gyu, 1I
 Patil, Harshada, 1Y, 2E
 Pavliček, Pavel, 12
 Peng, Kuang, 2T
 Peng, Wei-Jei, 1W, 1X
 Peng, Xiaoyuan, 1A
 Perinchery, Sandeep Menon, 2F
 Philipp, Katrin, 07
 Pramanik, Manojit, 0C, 0G, 0U, 11
 Qian, Kemao, 23
 Qu, Weijuan, 1C, 22, 24, 2J, 2M
 Quan, Chenggen, 2A
 R., Nischitha, 1Y
 Radner, H., 0K
 Ren, Pu, 1O, 20
 Ri, Shien, 0I, 2N
 Rios, Ramiro, 2W
 Romanenko, Alexey, 2W
 Rothhardt, Jan, 2O
 Sabapathy, Tamilarasan, 2B
 Sae Tae, Veera, 06
 Sakai, Yusuke, 2U
 Sane, Vani, 2E
 Sato, Akiyoshi, 2N
 Sato, Eiichi, 2N
 Sato, Katsutoshi, 1M
 Sato, Osamu, 1M
 Seah, Chee Hwee, 0Q
 Seah, Leong Keey, 2L, 2R
 Settu, Balachandar, 1Q
 Sharan, Preeti, 1Y, 2E
 Shearwood, C., 2L
 Shen, Xukun, 1Z, 29
 Shikha, 2D
 Shimizu, Yuki, 04
 Shinde, Anant, 2F
 Shui, Wuyang, 1O, 20
 Simonov, Konstantin, 2W
 Situ, Guohai, 05
 Sivasubramanian, Kathyayini, 0G
 Song, Chaolong, 2P
 Song, Inho, 2U
 Sui, Huaxin, 15
 Sun, Yuchun, 0D, 0V, 15, 1K, 1T
 Sun, Jianfei, 1E, 2T
 Sun, Jiasong, 09, 13, 1P, 26, 2C
 Sun, Pei-Li, 1X
 Sun, Tao, 2K
 Sundarajan, Asokan, 2B, 2D
 Sung, Cheng-Kuo, 17
 Sze, Jyh-Rou, 0B

T. S., Indumathi, 1Y, 2E
 Takatsuji, Toshiyuki, 1M
 Tan, Runtao, 0H
 Tan, Yidong, 0H, 0L
 Tanaka, Yoshihisa, 0I
 Tang, Yu-Hsiang, 1W, 1X
 Tian, Y. B., 0F
 Tian, Ye, 1Z
 Tseng, Shih-Feng, 17
 Tsuda, Hiroshi, 0I, 2N
 Tünnermann, Andreas, 2O
 Umebayashi, Takashi, 2N
 Umesh, Sharath, 2D
 Upputuri, Paul Kumar, 0C, 0G
 V. K., Shinoj, 1J, 1L
 Vadakke Matham, Murukeshan, 1J, 1L, 1U,
 2F, 2I, 2L, 2P, 2Q, 2R
 Verawaty, 1I
 Wang, Chinhua, 14
 Wang, Hongqiao, 0R
 Wang, Jianfeng, 14
 Wang, Miao, 14
 Wang, Qinghua, 0I
 Wang, Qiong-Hua, 1B
 Wang, Yong, 0D, 0V, 15, 1K, 1T
 Wang, Zhaomin, 1C, 22, 24, 2J
 Watanabe, Masato, 2U
 Wei, An-Chi, 0B
 Wen, Yongfu, 1C, 22, 24, 2J, 2M
 Weng, Chun-Jen, 0Z
 Weng, Dongdong, 28
 Widjaja, Joewono, 0M
 Wu, Fa, 2K
 Wu, Fan, 0A
 Wu, Rui-Yang, 0W
 Wu, Wen-Hong, 02, 0B
 Wu, Zhongke, 20
 Xiang, Li, 28
 Xiang, Ning, 0Q
 Xiong, Cheng, 2V
 Xiong, Yu-xue, 0D, 1K
 Xu, Fuyang, 14
 Xu, Haiming, 2V
 Xu, Ke, 14
 Yan, Fengtao, 0A
 Yang, Chong, 2V
 Yang, Fang, 1C, 22, 24, 2J
 Yang, Hui-fang, 0D, 0V, 15, 1K
 Ye, Tao, 08
 Yeo, Felicia Yan Xin, 2S
 Yong, Saw Soon, 1A
 Yoshida, Takeshi, 2N
 You, Zhen-Ting, 0T
 Yu, Yang, 1A
 Yu, Yingjie, 10, 2K
 Yuan, Fusong, 0V
 Zeng, Zhenxiang, 10, 2K
 Zeng, Zhige, 0R
 Zhang, Jialin, 1P, 2C
 Zhang, Jing, 0Q
 Zhang, Shulian, 0H
 Zhang, Song, 0J
 Zhang, Tianzi, 0Y
 Zhang, Yilei, 2S
 Zhang, Ying, 1F
 Zhang, Yuzhen, 13, 26, 2C
 Zhang, Zhenliang, 28
 Zhang, Zhifeng, 2S
 Zhao, Huijie, 1N
 Zhao, Jianlin, 27
 Zhao, Ming, 23
 Zhao, Tian, 15
 Zhao, Yi-jiao, 0D, 1K
 Zheng, Fasong, 0L
 Zheng, Huadong, 10, 2K
 Zheng, Zhaoyu, 1D, 1H
 Zhong, Z. W., 0F
 Zhou, Fuqiang, 08, 0O
 Zhou, Mingquan, 1O, 2O
 Zhou, Pengbo, 1O, 2O
 Zhou, Shouhuan, 1E
 Zhu, Qishi, 2U
 Zuo, Chao, 09, 13, 1P, 26, 2C, 2G, 2J

Conference Committee

Conference Chairs

Anand K. Asundi, Nanyang Technological University (Singapore)
Yu Fu, Nanyang Technological University (Singapore)

Organizing Committee

Thomas Bourgade, Nanyang Technological University (Singapore)
Kemao Qian, Nanyang Technological University (Singapore)
X. Huang, A*Star Agency for Science, Technology and Research (Singapore)
Yu Fu, Nanyang Technological University (Singapore)
Lujie Chen, Singapore University of Technology and Design (Singapore)
Zhongping Fang, Singapore Institute of Manufacturing Technology (Singapore)
J. Zhu, Wavelength Opto-Electronic(s) Pte Ltd. (Singapore)
Young-Jin Kim, Nanyang Technology University (Korea, Republic of)
V. R. Singh, Singapore-MIT Alliance for Research and Technology (Singapore)
Yilei Zhang, Nanyang Technological University (Singapore)

International Advisory Committee

A. Albertazzi (Brazil)	John McBride (United Kingdom)	Xiaoqiang Peng (China)	Zhenyu Jiang (China)	Jim Trolinger (United States)
B. Ahluwalia (Norway)	Joris Dirckx (Belgium)	Peter De Groot (United States)	S. Sumriddetchkajorn (Thailand)	Yuehong Yin (China)
Benny Cheung (Hong Kong)	Jyoti Mazumder (United States)	Pietro Ferrero (Italy)	Seung-Woo Kim (Korea, Republic of)	Yoshihiro Ohno (United States)
Brian Culshaw (United Kingdom)	Keith Emery (United States)	Pramod Rastogi (Switzerland)	Stefan Winter (Germany)	Yingjie Yu (China)
ByoungHo Lee (Korea, Republic of)	Kai Li (China)	R. Pryputnewicz (United States)	T. V. Vorburge (United States)	Feihu Zhang (China)
Chisheng Chang (Taiwan)	Yanqiu Liu (China)	Ralf Bergmann (Germany)	Thomas Brown (United States)	Xi-Cheng Zhang (United States)
Liang-Chia Chen (Taiwan)	Lo Yu Lung (Taiwan)	Ralph Tatam (United Kingdom)	Thomas L. Koch (United States)	Chunyu Zhao (United States)

C. Gorecki (France)	M. Kujawska (Poland)	Renke Kang (China)	Ailing Tian (China)	Liehua Zheng (China)
Dario Ambrosini (Italy)	Manuel Costa (Portugal)	Hillar Aben (Estonia)	Yongjian Wan (China)	Ligong Zheng (China)
David Payne (United Kingdom)	Martin Huenten (Germany)	Hu Xia Tang (China)	Zhanshan Wang (China)	Yuqin Zhong (United States)
Duncan Moore (United States)	Mitsuo Takeda (Japan)	Hyug-Gyo Rhee (Korea)	Wolfgang Osten (Germany)	
Eki Hotta (Japan)	M. Fujigaki (Japan)	Ingrid Dewolf (Belgium)	Huimin Xie (China)	
Jin Guo Fan (China)	Tongsheng Mou (China)	James Wyant (United States)	Ralph Tatam (United Kingdom)	
Johannes Soons (United States)	Xiang Peng (China)	Jan Burke (Germany)	Lianxiang Yang (United States)	

Session Chairs

3D Imaging, Display, and Measurement
Huijie Zhao, BeiHang University (China)

Optical Design, Fabrication, and Testing
Shanyong Chen, National University of Defense Technology (China)
Chunyu Zhao, College of Optical Sciences, The University of Arizona
(United States)

General Themes
Anand Asundi, Nanyang Technological University (Singapore)
Fu Yu, Nanyang Technological University (Singapore)
Murukeshan Vadakke Matham, Nanyang Technological University
(Singapore)
Siwen Bi, Institute of Remote Sensing and Digital Earth (China)
Rajdeep Singh Rawat, Nanyang Technological University (Singapore)
Qinghua Wang, National Institute of Advanced Industrial Science and
Technology (Korea, Republic of)
Jürgen Czarske, Technische Universität Dresden (Germany)

Introduction

The third conference of the Optics and Photonics Society of Singapore — the International Conference on Optical in Photonic Engineering (icOPEN2015) — was successfully held 14–16 April 2015 at Singapore Expo. The conference was colocated with the MTA2015 Exhibition a leading exhibition in precision engineering in the region with over 500 exhibitors from 31 countries. This event featured technologies related to metrology, machine tools and tooling systems. It focused on high-value manufacturing capabilities in aerospace, oil & gas, medical technology, and complex equipment. The conference was attended by 172 delegates from 15 countries including students, academicians and company researchers.

Optical and photonic engineering are increasingly becoming mainstream providing new solutions to complex problems in various sectors from biomedical to semiconductors, space optics to ultrafast applications, from dimensional metrology to 3D imaging, display and measurement, from fiber optics to image processing and computer vision and optical design, and the manufacturing and testing of complex freeform for improved imaging and illumination systems. This diversity was made possible by our conference and session chairs. 3D Imaging, Display and Measurement, chaired by Huijie Zhao, and Optical Design Manufacturing and Testing chaired by Shanyong Wang and Chunyu Zhao attracted the majority of papers.

There were four plenary speakers who spoke on topics ranging from freeform optics to space optics, to ultrafast metrology and biomedical optics. In addition, the 40 odd invited speakers provide a broad spectrum of topics with both research and applications driven themes. The poster sessions as well as the individual themed oral presentations were well attended until the end of the conference, and good interaction in the question and answer session made these talks interesting and informative.

We take this opportunity to thank all speakers and authors for contributing to the success of the conference, to members of the organizing committee for their assistance and enthusiastic support, to the session chairs, to our sponsors, and to the staff of Singapore Exhibition Services Pte Ltd. for ensuring the efficient execution of the conference program.

Anand K. Asundi
Yu Fu

