International Symposium on Optoelectronic Technology and Application 2014:
Advanced Display Technology; and Nonimaging Optics: Efficient Design for Illumination and Solar Concentration

Byoungho Lee
Ting-Chung Poon
Yongtian Wang
Yong Bi
Roland Winston
Yi Luo
Editors

13–15 May 2014
Beijing, China

Organized by
Photoelectronic Technology Committee, Chinese Society of Astronautics (China)

Sponsored by
Chinese Society of Astronautics (China)
China High-tech Industrialization Association (China)

Technical Cosponsor and Publisher
SPIE

Volume 9296
Contents

v Authors

vii Symposium Committees

xi Conference Committee

xiii Introduction

ADVANCED DISPLAY TECHNOLOGY AND APPLICATION

9296 02 Real-time integral imaging system with handheld light field camera (Invited Paper) [9296-8]
9296 03 Development of full color holographic optical element recorded on aspherical substrate with photopolymer (Invited Paper) [9296-15]
9296 04 Holographic color imaging of incoherent three-dimensional objects by off-axis Fourier triangular digital holography [9296-29]
9296 05 CMOS compatible avalanche photodetector and its application in communications [9296-12]
9296 06 Optimize the modulation response of twisted-nematic liquid crystal displays as pure phase spatial light modulators [9296-4]
9296 07 Ultra-wide fast fisheye for security and monitoring applications [9296-1]
9296 08 Aviation spectral camera infinity target simulation system [9296-27]
9296 09 Study of improved ray tracing parallel algorithm for CGH of 3D objects on GPU [9296-13]
9296 0A Design of multi-mode compatible image acquisition system for HD area array CCD [9296-25]
9296 0B A method of rapidly evaluating image quality of NED optical system [9296-10]
9296 0C The development and outlook of variable-focus lens [9296-23]
9296 0D High-definition video display based on the FPGA and THS8200 [9296-24]
9296 0E Colorized linear CCD data acquisition system with automatic exposure control [9296-26]
9296 0F Application of real image display and generation technique in space optical system [9296-28]
9296 0G Research on the aero-thermal effects by 3D analysis model of the optical window of the infrared imaging guidance [9296-22]
Research and analysis on the thin films sputtered by the Ba-Al-S:Eu target fabricated by powder sintering [9296-16]

High-power and efficient Nd:YVO4/PPMgLN arrayed green laser for laser display [9296-9]

Investigation of homogenizing the light field in laser display [9296-18]

Blue phase liquid crystalline polymers and its application in manned spacecraft [9296-19]

Numerical analysis on imaging character of a single microsphere [9296-31]

5W intracavity frequency-doubled green laser for laser projection [9296-21]

NONIMAGING OPTICS: EFFICIENT DESIGN FOR ILLUMINATION AND SOLAR CONCENTRATION

Design of beam expander for 90-nm lithography tool [9296-101]

Fresnel lens solar beam convergence properties [9296-106]

Design of chirped fly's eye uniformizer for ArF lithography illumination system [9296-108]

Single-pulse femtosecond laser Bessel beams drilling of high-aspect-ratio microholes based on electron dynamics control [9296-109]
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.

Bi, Yong, 0I, 0M
Bin, Ma, 0N
Chen, Jiabi, 0C
Cong, Bin, 09
Dai, Binfei, 0J
Fang, Tao, 0M
Gao, Zhishan, 07
Guo, Sha, 0L
Guo, Weiguo, 0K
Guo, Wenji, 08
Han, Weina, 0Q
He, Ruicong, 0F
He, Suhong, 0J
Huang, Minshuang, 0D
Huang, Yanhua, 0J
Jeong, Youngmo, 02
Jiang, Lan, 0Q
Jiang, Xiaoyu, 09
Kang, Mingwu, 06
Kim, Jonghyun, 02
Kim, Nam, 03
Lee, Byoungho, 02
Li, Guohui, 05
Li, Shu, 0M
Li, Wangling, 0K
Li, Xia, 0J
Li, Xiaofan, 0E
Li, Xiaowei, 0Q
Li, Yanqi, 0P
Lin, Li, 0F, 0G, 0N
Lin, Qiaowen, 0L
Liu, Jiu, 08
Liu, Xinya, 08
Lu, Yongfeng, 0Q
Lv, Gunbo, 0B
Ma, Baiheng, 06
Man, Tianlong, 04
Ming, Xing, 0B
Peng, Fei, 06
Peng, Runling, 0C
Piao, Mei-lan, 03
Qi, Yan, 0I, 0M
Qian, Jia, 0D
Qiao, Zhanduo, 0I
Qiu, Chuankai, 0B
Rong, Lu, 0L
Samy, Ahmed M., 07
Sui, Xiubao, 0A, 0D, 0E
Sun, Qi, 0B

Tang, Miangang, 05
Tian, Feng, 0O
Wan, Yuhong, 04
Wang, Chen, 0A
Wang, Dayong, 0L
Wang, Dongdong, 0M
Wang, Dongzhou, 0M
Wang, Yu, 0I
Wang, Yunxin, 0L
Wei, Lidong, 0P
Wei, Maowei, 0C
Wu, Chengguo, 0J
Wu, Hui-Ying, 03
Wu, Zhigang, 05
Xia, Bo, 0Q
Xiao, Lei, 0P
Xing, Han, 0N
Xu, Bo, 0G
Xu, Fang, 0H, 0K
Xue, Wei, 0H
Yan, Boxia, 0I, 0M
Yan, Xueliang, 0Q
Yang, Huan, 0B
Yao, Jun, 09
Yeom, Jiwoon, 02
Yu, Zhinong, 0H
Zhang, Dongpu, 0H, 0K
Zhao, Kai, 09
Zhao, Weiwei, 0Q
Zhou, Jiawu, 06
Zhu, Ying, 0G
Symposium Committees

Symposium Chairs

Guofan Jin, Tsinghua University (China)
Songlin Zhuang, University of Shanghai for Science and Technology (China)

Conference Committee

Bingheng Lu, Xi'an Jiaotong University (China)
Byoungso Lee, Seoul National University (Republic of Korea)
Daren Lv, Institute of Atmospheric Physics (China)
David Webb, Aston University (United Kingdom)
Dianyuan Fan, Shanghai Institute of Optics and Fine Mechanics (China)
Feng Zhang, Academy of Chinese Aerospace Science and Industry Feihang Technology (China)
Gaurav Sharma, University of Rochester (United States)
Guangjun Zhang, Beihang University (China)
Huitao Fan, Luoyang Optoelectro Technology Development Center (China)
Huixing Gong, Shanghai Institute of Technical Physics (China)
Jannick Rolland, University of Rochester (United States) and LighTopTech Corporation (United States)
Jianquan Yao, Tianjin University (China)
Jiaqi Wang, Changchun Institute of Optics, Fine Mechanics and Physics (China)
Jingshan Jiang, Center for Space Science and Applied Research (China)
Junhao Chu, Shanghai Institute of Technical Physics (China)
Lijun Wang, Changchun Institute of Optics, Fine Mechanics and Physics (China)
Lin Li, Laser Processing Research Centre, The University of Manchester (United Kingdom)
Liwei Zhou, Beijing Institute of Technology (China)
Ming C. Leu, Missouri University of Science and Technology (United States)
Norbert Kaiser, Fraunhofer Institute for Applied Optics and Precision Engineering (Germany)
Qifeng Yu, National University of Defense Technology (China)
Qingxi Tong, The Institute of Remote Sensing and Digital Earth (China)
Shouhuan Zhou, North China Research Institute of Electro-optics (China)
Program Committee

Songlin Zhuang, Chair, University of Shanghai for Science and Technology (China)
Huaming Wang, Co-chair, Beihang University (China)
Huihai Xie, Co-chair, University of Florida (United States)
Jannick Rolland, Co-chair, University of Rochester (United States)
Jürgen Czarske, Co-chair, Technische Universität Dresden (Germany)
Yongtian Wang, Co-chair, Beijing Institute of Technology (China)
Anatoli G. Borovoi, V.E. Zuev Institute of Atmospheric Optics (Russian Federation)
Bincheng Li, Institute of Optics and Electronics (China)
Binghen Lu, Xi’ an JiaoTong University (China)
Byoungho Lee, Seoul National University (Republic of Korea)
Changxiang Yan, Changchun Institute of Optics, Fine Mechanics and Physics (China)
Dae Wook Kim, The University of Arizona (United States)
David Webb, Aston University (United Kingdom)
Dawei Zhang, University of Shanghai for Science and Technology (China)
Dong Liu, Anhui Institute of Optics and Fine Mechanics (China)
Fugen Zhou, Beijing University of Aeronautics and Astronautics (China)
Gaurav Sharma, University of Rochester (United States)
Geert Verhaeghe, Faurecia Autositze GmbH (Germany)
Guangya Zhou, National University of Singapore (Singapore)
Haimei Gong, Shanghai Institute of Technical Physics (China)
Jin Lu, Tianjin Jinhang Institute of Technical Physics (China)
Jun Zhou, Shanghai Institute of Optics and Fine Mechanics (China)
Kai Cheng, Brunel University (United Kingdom)
Ligong Zheng, Changchun Institute of Optics Fine Mechanics and Physics (China)
Lijun Wang, Changchun Institute of Optics, Fine Mechanics and Physics, (China)
Lin Li, Laser Processing Research Centre, The University of Manchester (United Kingdom)
Ming C. Leu, Missouri University of Science and Technology (United States)
Minlin Zhong, Tsinghua University (China)
Mircea Guina, Tampere University of Technology (Finland)
Norbert Kaiser, Fraunhofer Institute for Applied Optics and Precision Engineering (Germany)
Pu Wang, Beijing University of Technology (China)
Roland Winston, University of California (United States)
Rongbing W. B. Lee, The Hong Kong Polytechnic University (Hong Kong, China)
Shulian Zhang, Tsinghua University (China)
Ting-Chung Poon, Virginia Polytechnic Institute and State University (United States)
Wei Wang, Beijing Institute of Aerospace Control Devices (China)
Wenli Ma, The Institute of Optics and Electronics (China)
Yi Luo, Tsinghua University (China)
Yiqin Ji, Tianjin Jinhang Institute of Technical Physics (China)
Yong Bi, Academy of Opto-electronics (China)
Yongnian Yan, Wuhan Ordnance Non-Commissioned Officers Academy (China)
Zhichuan Niu, Institute of Semiconductors (China)
Conference Committee

Conference Chairs

Byoungho Lee, Seoul National University (Korea, Republic of)
Ting-Chung Poon, Virginia Polytechnic Institute and State University (United States)
Yongtian Wang, Beijing Institute of Technology (China)
Yong Bi, Academy of Opto-Electronics (China)
Roland Winston, University of California, Merced (United States)
Yi Luo, Tsinghua University (China)
Introduction

We had the great honor of organizing the International Symposium on Optoelectronic Technology and Application 2014 (IPTA 2014) in Beijing. It was truly a great pleasure for us to greet nearly 1,000 participants from many different countries attending IPTA 2014! We firmly believe that the symposium will become an important international event in the field of photoelectronic technology.

IPTA 2014 was sponsored by Chinese Society of Astronautics (CSA) and China High-tech Industrialization Association, technically co-sponsored by SPIE, and organized by Photoelectronic Technology Committee, Chinese Society of Astronautics. 27 cooperating organizations supported the conference. There were nearly 600 papers accepted for presentation at IPTA 2014, contributed by over 1078 authors from more than 10 countries, including United States, United Kingdom, Germany, France, Norway, Australia, Canada, Japan, Korea, Russia, and China. We had six plenary speeches and 228 well-known scientists and experts, from both home and abroad to give invited talks at different sessions.

The purpose of IPTA 2014 was to provide a forum for the participants to report and review innovative ideas, with up-to-date progress and developments, and discuss the novel approaches to application in the field of photoelectronic technology. We sincerely hope that the research and development in the optical and photoelectronic fields will be promoted, and international cooperation sharing the common interest will be enhanced.

On behalf the Organization Committee of IPTA 2014, we would like to heartily thank our sponsors and cooperating organizations for all they have done for the conference. We would also like to thank the authors for their contribution to the proceedings; the participants and friends of IPTA 2014, for their interest and efforts in helping us to make the symposium possible; and the Program Committee for their effective work and valuable advice, especially the IPTA 2014 Secretariat and the SPIE staff, for their tireless efforts and outstanding services in preparing the conference and publishing the Proceedings.

Guofan Jin
Songlin Zhuang
IPTA 2014 Symposium Committee Chairs