PROCEEDINGS OF SPIE

Fifth International Symposium on Instrumentation Science and Technology

Jiubin Tan Xianfang Wen Editors

15–18 September 2008 Shenyang, China

Sponsored by

ICMI—International Committee on Measurements and Instrumentation • NSFC—National Natural Science Foundation of China (China) • CSM—Chinese Society for Measurement (China) • CIS—China Instrument Society (China)

Organized by ICMI—International Committee on Measurements and Instrumentation • Harbin Institute of Technology (China) • ICCSM—Instrumentation Committee of Chinese Society for Measurement (China)

Co-organized by Shenyang University of Technology (China)

Cooperating Organization SPIE

Published by SPIE

Volume 7133

Part One of Two Parts

Proceedings of SPIE, 0277-786X, v. 7133

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

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 *Fifth International Symposium on Instrumentation Science and Technology*, edited by Jiubin Tan, Xianfang Wen, Proceedings of SPIE Vol. 7133 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 0277-786X ISBN 9780819473677

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 © 2009, 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/09/\$18.00.

Printed in the United States of America.

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



SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent 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 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. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

Part One

xvii xxi xxiii	Conference Committees Introduction from Li Zhu Introduction from Jiubin Tan
SESSION 1	INSTRUMENT SCIENCE: FUNDAMENTAL THEORY AND METHODOLOGY
7133 02	Advanced research on nonlinearity in heterodyne interferometer [7133-101] W. Hou, W. Cui, Univ. Shanghai for Science and Technology (China)
7133 03	Functions and three dimensional parameters of surface texture [7133-102] Q. Qi, X. Liu, Huazhong Univ. of Science and Technology (China); X. Jiang, Huazhong Univ. of Science and Technology (China) and Univ. of Huddersfield (United Kingdom)
7133 04	Test procedures and artefacts for optical coordinate metrology [7133-103] U. Neuschaefer-Rube, W. Ehrig, M. Neugebauer, K. Wendt, Physikalisch-Technische Bundesanstalt (Germany)
7133 05	Symmetrically associated combination method for accuracy verification of Coordinate Measuring Machines [7133-104] H. Wang, X. Chen, Y. Fei, Hefei Univ. of Technology (China)
7133 06	Test method based on neural network for crosstalk faults in digital circuits [7133-105] Z. Pan, L. Cheng, South China Normal Univ. (China); G. Zhang, Sun Yat-Sen Univ. (China)
7133 07	Generation of test patterns for defect and noise in VLSI circuits using binary decision diagrams [7133-106] Z. Pan, South China Normal Univ. (China); Y. Chen, Chengdu Univ. (China); L. Chen, South China Normal Univ. (China)
7133 08	Analysis of mechanical dynamometer based on bifurcation theory [7133-107] Y. Cui, BeiHang Univ. (China); Z. Yang, Tangshan College (China); C. Yun, BeiHang Univ. (China); G. Li, Tangshan College (China); X. Sun, Beihang Univ. (China)
7133 09	Approach method based on brightness temperature for multi-spectral thermometer [7133-108] G. Yuan, Z. Fan, X. Sun, J. Dai, Harbin Institute of Technology (China)
7133 0A	Mathematical model of strip specimens for application of pulse-heating technique [7133-109] P. Xiao, Q. Wang, J. Dai, Harbin Institute of Technology (China)
7133 OB	Research of zero crossing point real-time detecting of quasi-sinusoidal signal [7133-110] Y. Dong, X. Zhang, Northwestern Polytechnical Univ. (China)

- 7133 0C Variable sampling plan for reliability of irreparability system in exponential process
 [7133-111]
 J. Shi, S. Wang, Tsinghua Univ. (China)
- Statistical characters of antenna rod slant errors [7133-112]
 L. Jin, Beijing Jiaotong Univ. (China) and First Survey and Design Institute of China Railways (China); L. Wang, S. Yang, Beijing Jiaotong Univ. (China)
- 7133 0E Speed ratio control for cars equipped with metal v-belt continuously variable transmission [7133-113]
 M. Zhou, B. Zhang, J. Wen, Harbin Univ. of Science and Technology (China)
- 7133 OF Simulation of air gap vibration on aerostatic bearing under flow/structure coupled conditions [7133-114]
 Q. Wang, J. Wu, D. Li, China Jiliang Univ. (China)
- 7133 0G Effect of probe offset on ultra-precision measurement of circular profile [7133-115] J. Huang, J. Tan, Harbin Institute of Technology (China)
- 7133 0H **Damping vibration studies of scanning near-field optical microscope** [7133-116] T. Y. Chen, H. Lee, National Cheng Kung Univ. (Taiwan)
- The study and realization of standard dynamic signals of dynamic characteristic calibration for high precision displacement sensor [7133-117]
 X. Zi, National Institute of Metrology (China); Y. S. Liang, China Institute of Metrology (China); Y. X. You, National Institute of Metrology (China)

SESSION 2 INSTRUMENTS AND SYSTEMS

- 7133 0J Analysis of optical theodolite dynamic accuracy evaluation method [7133-200] X. Yun, Harbin Institute of Technology (China)
- 7133 0K Precision measurement of scroll profiles [7133-201] Y. Arai, A. Inada, W. Gao, Tohoku Univ. (Japan)
- 7133 OL Impact response evaluation of force transducer for use in falling weight deflectometer system [7133-202]
 Y. Fujii, Gunma Univ. (Japan); T. Fujyu, H. Okano, Tokyo Sokki Kenkyujo Co., Ltd. (Japan)
- Design of rehabilitation robot hand for fingers CPM training [7133-203]
 H. Zhou, South China Univ. of Technology (China); T. W. Chan, K. Y. Tong, K. K. Kwong, The Hong Kong Polytechnic Univ. (Hong Kong, China); X. Yao, South China Univ. of Technology (China)
- 7133 0N **Theoretic research on effective viewing field of spin vision measurement system** [7133-204] S. Yan, S. Shen, C. Zhou, E. Li, L. Gao, H. Tong, National Univ. of Defense Technology (China)
- 7133 00 **The valuation of uncertainty on cylinder shell resonating density meter** [7133-205] X. W. Sui, Y. Li, Tianjin Polytechnic Univ. (China); G. X. Zhang, Y. M. Fan, Tianjin Univ. (China)

- 7133 OP Identification of inner parameters in laser radar measuring system through system error analysis [7133-206]
 Z. Du, S. Zhang, Y. Wei, M. Hong, Shanghai Jiao Tong Univ. (China)
- 7133 0Q **Modification and prototype test of staple gun** [7133-207] K. Tsue, G. Wu, Industrial Technology Research Institute (Taiwan)
- 7133 OR **FPGA-based distortion correction for laser spot inspection system** [7133-208] Z. Zhang, Y. Han, X. Chen, D. Yu, Tianjin Univ. (China)
- 7133 0S Loop-by-loop modeling of whole-closed-loop 2D high-precision motion platform [7133-209] S. Ye, D. Li, T. Guo, L. Fu, W. Xu, China Jiliang Univ. (China)
- 7133 0T **Measuring and balancing dynamic unbalance of precision centrifuge** [7133-210] Y. Yang, X. Huo, Harbin Institute of Technology (China)
- Application of master-slave multi-communication system in pilotless airborne mapping equipment [7133-211]
 Y. Zhang, Changchun Univ. of Science and Technology (China); J. Chen, Changchun Institute of Optics, Fine Mechanics and Physics (China); W. Wang, Changchun Univ. of Science and Technology (China)
- 7133 0V Determination of optimal observable subspace for strapdown inertial navigation systems through observability analysis [7133-212]
 Y. Yang, X. Huo, Harbin Institute of Technology (China)
- 7133 0W High-speed random equivalent sampling system for time-domain reflectometry [7133-213] J. Song, F. Yuan, Z. Ding, Harbin Institute of Technology (China)
- 7133 0X Error measuring system of rotary Inductosyn [7133-214] C. Liu, J. Zou, X. Fu, Harbin Institute of Technology (China)
- 7133 0Y **Design of integrated and networked multidimensional grating digital readout** [7133-215] L. Chang, H. Xu, G. Xiu, Shenyang Univ. of Technology (China)
- 7133 OZ Architectural design of flue gas continuous emission monitoring system [7133-216] H. Zhou, L. Jiang, Y. Tang, X. Yao, South China Univ. of Technology (China)
- 7133 10 **Dynamic modeling and analysis of large-scale antenna structure** [7133-217] L. Shen, Z. Gong, L. Liu, Shanghai Univ. (China); S. Luo, S. Yang, Wenzhou Univ. (China)
- A 3D error measurement system for CNC machining tools [7133-218]
 W. Jywe, National Formosa Univ. (Taiwan); Y. R. Jeng, National Chung-Cheng Univ. (Taiwan);
 Y. Li, C. Liu, National Taiwan Univ. (Taiwan); T. Hsu, National Chung-Cheng Univ. (Taiwan);
 H. Jwo, B. Lin, M. Lee, National Formosa Univ. (Taiwan); H. Kuo, C. Lin, C. Chiu, Metal
 Industries Research & Development Ctr. (Taiwan)
- Neural networks based in process tool wear prediction system in milling wood operations [7133-219]
 K. Szwajka, Univ. of Rzeszow (Poland); J. Zielinska-Szwajka, J. Gorski, Warsaw Agricultural Univ. (Poland)

- 7133 13 **Microfabricated scanning near-field probe for sub-terahertz spectroscopy** [7133-220] K. Iwami, Tokyo Univ. of Agriculture and Technology (Japan); T. Ono, M. Esashi, Tohoku Univ. (Japan)
- 7133 14 Nanometric edge profile measurement of cutting tools on a diamond turning machine [7133-221]
 T. Asai, Y. Arai, Y. Cui, W. Gao, Tohoku Univ. (Japan)
- Sputter deposited zinc oxide photoconductive antenna for terahertz time-domain spectroscopy [7133-222]
 K. Iwami, Tokyo Univ. of Agriculture and Technology (Japan); T. Ono, M. Esashi, Tohoku Univ. (Japan)
- 7133 16 Mass image data storage system for high resolution aerial photographic survey [7133-223] L. Zen, Harbin Institute of Technology (China) and The Academy of Equipment Command & Technology (China); J. Tan, Harbin Institute of Technology (China); Z. Zhao, The Academy of Equipment Command & Technology (China)
- 7133 17 Automatic calibration of dial gauges based on computer vision [7133-224] J. Zhao, H. Feng, M. Kong, China Jiliang Univ. (China)
- 7133 18 Metabolic measurements in cell culture and tissue constructs [7133-225]
 P. Rolfe, Oxford BioHorizons Ltd. (United Kingdom) and Harbin Institute of Technology (China) and Waseda Univ. (Japan)
- 7133 19 Monitoring of electric-cardio signals based on DSP [7133-226] Y. Yan, H. Sun, S. Lv, Harbin Univ. of Science and Technology (China)

SESSION 3 SENSORS AND CONVERTERS

- 7133 1A **Optical fiber gas sensing system based on FBG filtering** [7133-301] S. Wang, Yanshan Univ. (China)
- 7133 1B Inductosyn angle measuring system error based on AD2S80 resolver-to-digital converter [7133-302]
 - Z. Wang, X. Chen, R. Li, Harbin Institute of Technology (China)
- 7133 1C **Real-time indoor monitoring system based on wireless sensor networks** [7133-303] Z. Wu, Z. Liu, X. Huang, J. Liu, Logistical Engineering Univ. (China)
- Analysis of the optimal package diameter of FBG pressure sensor [7133-304]
 L. Liu, Y. He, Beijing Institute of Technology (China); F. Li, Y. Liu, Institute of Semiconductors (China)
- 7133 1E **Design of nodes for embedded and ultra low-power wireless sensor networks** [7133-305] J. Xu, B. You, J. Cui, J. Ma, X. Li, Harbin Univ. of Science and Technology (China)
- 7133 1F Quartz tuning fork temperature sensor testing system based on programmable chip [7133-306]

J. Xu, B. You, L. Hu, J. Ma, X. Li, Harbin Univ. of Science and Technology (China)

- 7133 1G Characteristic analysis of contactless transformer [7133-307] C. Liu, J. Zou, X. Fu, Harbin Institute of Technology (China)
- 7133 11 Research on the permanent magnet synchronous motor control system based on additional and sensing windings [7133-309]
 H. Wu, B. Kou, L. Li, Harbin Institute of Technology (China)
- 7133 1J **The study of an electromechanical actuator with a resolver as the position sensor** [7133-310] H. Wu, B. Kou, L. Li, Harbin Institute of Technology (China)
- Structure design and experimental research on the electric-pneumatic transfer device with piezoelectric actuator [7133-311]
 D. Li, Dalian Jiao Tong Univ. (China) and Dalian Univ. of Technology (China); B. Sun, W. Wang, Dalian Univ. of Technology (China); Y. Jia, Dalian Jiao Tong Univ. (China)
- 7133 1L Design of GMI micro-magnetic sensor based on Co-based amorphous alloys for space applications [7133-312] Y. Jiang, J. Fang, P. Han, Y. Song, X. Huang, T. Zhang, BeiHang Univ. (China)
- 7133 1M WSN multilateral localization algorithm based on Tikhonov regularization method [7133-313] L. Wang, H. Li, X. Du, Shandong Univ. (China)
- 7133 1N Wet gas measure by tapered tube variable area ring orifice [7133-314] G. Xue, Y. Shen, Harbin Institute of Technology (China)
- Research for the bearing grinding temperature on-line monitoring system based on the infrared technology [7133-315]
 Z. Huang, Zhongyuan Univ. of Technology (China)
- 7133 1P Achievement of digital control technology on high-power silicon controlled rectifier
 [7133-316]
 Y. Gao, Q. Sun, C. Liu, Jilin Univ. (China)
- Highly sensitive humidity sensor based on ultra-long-period fiber gratings with asymmetric refractive index modulation [7133-317]
 Y. Song, Chongqing Univ. (China); T. Zhu, Y. J. Rao, Chongqing Univ. (China) and Univ. of Electronic Science and Technology of China (China); Y. W. Zhao, Chongqing Univ. (China)
- 7133 1R SFDM/CWDM of hollow-core photonic crystal fiber based etalon strain sensors with long cavity lengths [7133-318]
 Y. J. Rao, Chongqing Univ. (China) and Univ. of Electronic Science and Technology of China (China); D. W. Duan, Chongqing Univ. (China); T. Zhu, Chongqing Univ. (China) and Univ. of Electronic Science and Technology of China (China); Y. N. Fan, Chongqing Univ. (China)

SESSION 4 SIGNAL AND IMAGE PROCESSING

7133 15 **High precision angle calibration of robotic total stations and laser trackers** [7133-401] D. Martin, European Synchrotron Radiation Facility (France); D. G. Chetwynd, The Univ. of Warwick (United Kingdom)

- Study of the characteristic of the penalty function in point cloud data's smoothing based on anisotropic heat conduction principle [7133-402]
 X. Zhang, Z. Jia, M. Xu, W. Liu, L. Liu, Zhejiang Univ. (China)
- 7133 1U **Three-dimensional object recognition based on 3D invariance** [7133-403] H. Yuan, G. Qin, J. Yu, Harbin Univ. of Science and Technology (China)
- 7133 1V Extraction of shaft-rate modulated electric fields of a ship in shallow sea with strong background noise [7133-404]
 B. Shen, Naval Univ. of Engineering (China) and Wuhan Non-Commissioned Officers School for Ordnance (China); S. Gong, X. Chen, F. Zhang, Naval Univ. of Engineering (China)
- Application of Hilbert-Huang transformation to fault diagnosis of rotary machinery [7133-405]
 F. Chen, X. Zhou, Q. Wu, T. He, H. He, Hubei Univ. of Technology (China) and Hubei Key Lab. of Manufacture Quality Engineering (China)
- 7133 1X Underdetermined blind mixing model recovery using differential evolution and Hough transformation [7133-406]
 N. Fu, G. Zhao, X. Peng, Harbin Institute of Technology (China)
- 7133 1Y Enhancement of infrared image using fractal based human visual system [7133-407]
 T. Yu, Harbin Institute of Technology (China) and Harbin Univ of Science and Technology (China); J. Dai, W. Kang, Harbin Institute of Technology (China)
- 7133 1Z A new local search method to design finite precision FIR filters [7133-408]
 Y. Zeng, S. Li, Xiangtan Univ. (China); M. Xu, Institute of Beijing Information Technology (China)
- 7133 20 Research on classifying technique for imbalanced dataset based on Support Vector Machines [7133-409]
 Z. Yang, Y. Peng, X. Peng, Harbin Institute of Technology (China)
- Fast centroid estimation algorithm for coordinates measurement of infrared markers
 [7133-410]
 L. Zhang, G. Chen, D. Ye, R. Che, Harbin Institute of Technology (China)
- 7133 22 **Multi-channel high-speed CMOS image acquisition and pre-processing system** [7133-411] C. Sun, F. Yuan, Z. Ding, Harbin Institute of Technology (China)
- 7133 23 Measuring accuracy of temperature dependence on thermal emissivity in flame [7133-412] S. Xia, Y. Guo, X. Zhu, Q. Yao, Wuhan Univ. of Engineering (China)
- 7133 24 **Research on steel ball surface quality detection technique based on CCD** [7133-413] L. Liu, H. Ma, Y. Ma, P. Li, Harbin Institute of Technology (China)
- 7133 25 Measurement of micro-hole with high aspect ratio by double optical fibers coupling [7133-414]
 J. Cui, J. Tan, F. Wang, C. Song, Harbin Institute of Technology (China)

- Automated detection of pulmonary nodules in CT images with support vector machines
 [7133-415]
 L. Liu, W. Liu, X. Sun, Harbin Institute of Technology (China)
- 7133 27 **Region-based image denoising through wavelet and fast discrete curvelet transform** [7133-416]

Y. Gu, Y. Guo, X. Liu, Y. Zhang, Harbin Institute of Technology (China)

- 7133 28 Application of adaptive wavelet transforms via lifting in image data compression [7133-417] S. Ye, Harbin Institute of Technology (China) and Heilongjiang Institute of Technology (China); Y. Zhang, Harbin Institute of Technology (China); B. Liu, Heilongjiang Institute of Technology (China)
- 7133 29 Cooperative optimization and their application in LDPC codes [7133-418]
 K. Chen, J. Rong, Univ. of Electronic Science and Technology of China (China); X. Zhong, Southwest Jiaotong Univ. (China)
- 7133 2A Extraction of lane markings based on steerable filters [7133-419] Y. Liu, J. Rong, K. Chen, Univ. of Electronic Science and Technology of China (China)
- 7133 2B **Squared gray weighted centroid algorithm based on bi-cubic interpolation** [7133-420] C. Liu, Y. Gao, Y. Zhang, Jilin Univ. (China)
- 7133 2C **Design and simulation of turbine impeller in hydrovalve** [7133-421] Y. Shi, Yantai Univ. (China)
- 7133 2D Applied strategy for options of invasive and non-invasive sensors and instruments [7133-422] Z. Yan, L. Xin, Harbin Institute of Technology (China); F. Scopesi, G. Serra, Gaslini Hospital, Univ. of Genova (Italy); J. Sun, Harbin Institute of Technology (China); P. Rolfe, Harbin Institute of Technology (China) and Oxford BioHorizons Ltd. (United Kingdom) and Waseda Univ. (Japan)
- Phase shift error of dynamic spectrum [7133-423]
 Y. Wang, Liaoning Technical Univ. (China); L. Lin, Tianjin Univ. (China); Y. Ma, Liaoning Technical Univ. (China); G. Li, Tianjin Univ. (China); R. Zeng, Academy of Military Transportation (China)
- 7133 2F **CARS application in measurement of flame temperature** [7133-424] H. Zhang, J. Dai, Harbin Institute of Technology (China)

SESSION 5 ELECTROMAGNETIC MEASUREMENT AND AUTOMATED TESTING

- 7133 2G Simulation of radar antenna scan and design of hardware [7133-501] W. Xu, J. Xu, G. Xi, Q. Fei, Navy PCB Test Ctr. of Electronic Equipment (China)
- 7133 2H Measurement of shaft-rate modulated electric fields of a ship in a shallow sea [7133-502] B. Shen, Naval Univ. of Engineering (China) and Wuhan Non-Commissioned Officers School for Ordnance (China); S. Gong, X. Chen, F. Zhang, Naval Univ. of Engineering (China)

- 7133 21 **Test scheduling of system on chip for crosstalk effects on core interconnects** [7133-503] Z. Pan, South China Normal Univ. (China); Y. Chen, Chengdu Univ. (China); L. Chen, South China Normal Univ. (China)
- 7133 2J **Design of differential-switched-capacitor vortex flowmeter** [7133-504] Y. Zhang, J. Dai, Harbin Institute of Technology (China)

SESSION 6 LASER MEASUREMENT TECHNIQUES AND INSTRUMENTS

- 7133 2K
 In-line fiber-optic Fabry-Perot refractive-index tip sensors [7133-601]
 Y. Rao, Univ. of Electronic Science and Technology of China (China) and Chongqing Univ. (China)
- Precision inspection of diameters for circular reflecting cylinders [7133-602]
 Y. V. Chugui, Technological Design Institute of Scientific Instrument Engineering (Russian Federation) and Novosibirsk State Univ. (Russian Federation); Y. A. Lemeshko, Technological Design Institute of Scientific Instrument Engineering (Russian Federation)
- Application of superresolution technology in non-contact measurement on edge detection of precise parts [7133-603]
 H. Lu, B. Lei, Wuhan Univ. of Technology (China); J. Jung, Chonbuk National Univ. (Korea, Republic of)
- A laser measurement system with multi-degree-of-freedom [7133-604]
 L. Long, Hubei Univ. of Technology (United States); L. Yang, X. Wang, Hubei Univ. of Technology (China) and Hubei Key Lab. of Manufacture Quality Engineering (China);
 Z. Zhai, Hubei Univ. of Technology (China)
- Observation of single- and two-photon luminescence on optically quenched wide-gap semiconductor crystals [7133-605]
 A. S. M. Noor, Shizuoka Univ. (Japan) and Univ. Putra Malaysia (Malaysia); M. Torizawa, A. Miyakawa, Y. Kawata, Shizuoka Univ. (Japan)
- 7133 2P **Parallel laser ranging technology of array type** [7133-606] M. Xiong, R. Zhao, A. Zhou, Dalian Maritime Univ. (China)
- 7133 2Q Laser precision ranger based on beat-wave interferometry [7133-607] T. Zhang, Y. Wu, H. Weia, Sichuan Univ. (China)
- 7133 2R Observation of dust aerosol profile and atmospheric visibility of Xi'an with Mie scattering lidar [7133-608]
 J. Liu, D. Hua, Xi'an Univ. of Technology (China)
- 7133 2S Orthogonally polarized lasers' semi-classical theory for tuning inner cavity and external cavity [7133-609]
 L. Cui, S. Zhang, X. Zong, Tsinghua Univ. (China)
- 7133 21 High-resolution compact displacement sensor based on anisotropic feedback of microchip Nd:YAG lasers [7133-610]
 Y. Tan, S. Zhang, Tsinghua Univ. (China)

- 7133 20 **Design of intelligent receiver system for phase-shift laser range finder** [7133-611] F. Jia, Z. Ding, F. Yuan, Harbin Institute of Technology (China)
- Data fusion algorithm for high accuracy coordinate transformation [7133-612]
 J. Lv, Harbin Institute of Technology (China) and North East Forestry Univ. (China); C. Zhang, W. Tang, Harbin Institute of Technology (China)
- 7133 2W Investigation of diode-pumped 1064nm dual-frequency Nd:YAG laser with large frequency difference [7133-613]
 M. Jiao, J. Xing, Y. Liu, Y. Yang, Xi'an Univ. of Technology (China)
- 7133 2X **Pavement roughness measurement based on structure light** [7133-614] W. Liu, X. Sun, J. P. Huang, K. Xie, Harbin Institute of Technology (China)
- 7133 2Y Study on use of fiber Raman amplifier in U-band for gas detection [7133-615] L. Liu, C. Wu, G. Lin, L. Zhai, Beijing Jiaotong Univ. (China); Y. Li, Nankai Univ. (China)
- A fast and ultra-precision laser heterodyne interferometry signal processing method based on digital delay line loop [7133-616]
 L. Yan, P. Hu, X. Diao, J. Tan, Harbin Institute of Technology (China)
- Design of driving and control system based on Voice Coil Actuation for linear motion of micro-lens array [7133-617]
 J. Xiang, N. Wu, J. Zhang, L. Wu, Harbin Institute of Technology (China)
- Distributed Bragg reflector fiber lasers for high temperature sensor applications (Invited Paper) [7133-618]
 B. Guan, Y. Zhang, H. Wang, D. Chen, Dalian Univ. of Technology (China); H. Tam, Dalian Univ. of Technology (China) and The Hong Kong Polytechnic Univ. (Hong Kong, China)

SESSION 7 HOLOGRAPHY AND DIFFRACTION OPTICS AND INSTRUMENTS

- Application of diffractive optical elements for inspection of complicated through holes
 [7133-701]
 Y. V. Chugui, Technological Design Institute of Scientific Instrument Engineering (Russian
 Federation) and Novosibirsk State Univ. (Russian Federation); Y. A. Lemeshko, P. S. Zav'yalov,
 Technological Design Institute of Scientific Instrument Engineering (Russian Federation)
- 7133 33 **Computer generated holograms for aspheric optics testing** [7133-702] A. G. Poleshchuk, Institute of Automation and Electrometry (Russian Federation)
- 7133 34 Designing high efficiency uniform-intensity splitter with binary-phase subwavelength structure [7133-703]
 S. Yan, E. Li, C. Zhou, S. Shen, L. Gao, H. Tong, National Univ. of Defense Technology (China)
- 7133 35 Thermal effects researching for laser microstructures synthesis by thermochemical circular laser writing [7133-704]
 V. G. Nikitin, Technological Design Institute of Scientific Instrument Engineering (Russian Federation)

7133 36 **Fabrication of transmission gratings for extreme ultraviolet interference lithography** [7133-705]

J. Ma, X. Zhu, Institute of Microelectronics (China); W. Zhu, Shanghai Institute of Applied Physics (China); C. Xie, T. Ye, Institute of Microelectronics (China); P. Shi, Technical Univ. of Denmark (Denmark)

- 7133 37 **Design of diffractive microlenses using general focal length function** [7133-706] J. Lin, J. Liu, C. Zhao, Harbin Institute of Technology (China)
- 7133 38 Effect of tilted metallic mesh on modulation transfer function of optical system [7133-707] Z. Lu, Z. Fan, D. Zheng, Harbin Institute of Technology (China)

SESSION 8 ADVANCED OPTICS MEASUREMENT TECHNIQUES

- Absolute distance interferometry using diode lasers [7133-801]
 K. Meiners-Hagen, A. Abou-Zeid, Physikalisch-Technische Bundesanstalt (Germany);
 L. Hartmann, Research Institution for Polymeric Materials and Composites (Germany)
- Form measurements by optical and tactile scanning [7133-802]
 O. Jusko, M. Neugebauer, H. Reimann, Physikalisch-Technische Bundesanstalt (Germany);
 P. Drabarek, M. Fleischer, T. Gnausch, Robert Bosch GmbH (Germany)
- Preliminary study on near-infrared spectroscopic measurement of urine hippuric acid for the screening of biological exposure index [7133-803]
 M. Ogawa, yu.sys Corp. (Japan) and Kanazawa Univ. (Japan); Y. Yamakoshi, yu.sys Corp. (Japan) and Chiba Univ. (Japan); K. Motoi, T. Yamakoshi, K. Yamakoshi, Kanazawa Univ. (Japan)
- 7133 3C Measurement of nano-particles size by evanescent interference field with conventional optical microscope [7133-804]
 X. Yu, Y. Araki, K. Iwami, N. Umeda, Tokyo Univ. of Agriculture and Technology (Japan)
- 7133 3D Near-field birefringence response of IPS liquid crystal thin film detected by Bi-SNOM [7133-805]
 J. Qin, N. Umeda, Tokyo Univ. of Agriculture and Technology (Japan)
- 7133 3E Experimental study on measurement accuracy of hot disk thermal constants analyser [7133-806]

Q. Wang, J. Dai, C. Xin, Harbin Institute of Technology (China)

- 7133 3F Thermal expansion coefficient and electrical resistivity of nonuniform temperature specimen [7133-807]
 C. Xin, J. Dai, Q. Wang, Harbin Institute of Technology (China); X. He, Aerospace Research Institute of Materials and Processing Technology (China)
- 7133 3G Measurement of surface temperature with thermal infrared imager [7133-808]
 Y. Li, Harbin Institute of Technology (China) and Xi'an Polytechnic Univ. (China); X. Sun,
 G. Yuan, Harbin Institute of Technology (China); X. Yang, Xi'an Polytechnic Univ. (China)
- 7133 3H **Precise optical measurement of surface contour of large paraboloid antenna** [7133-809] L. Shen, Z. Gong, L. Liu, S. Yang, Shanghai Univ. (China)

- Full-field mapping of the stress-induced birefringence using a polarized low coherence interference microscope [7133-810]
 J. Chen, Y. Huang, National Chung-Cheng Univ. (Taiwan)
- 7133 3J High accuracy measurements of long-term stability of material with PTB's Precision Interferometer [7133-811]
 R. Schödel, A. Abou-Zeid, Physikalisch-Technische Bundesanstalt (Germany)
- A time-resolved pump-probe system to study the dynamic excited-state nonlinearities of chloroaluminum phthalocyanine/ethanol solution based on the 4f nonlinear-imaging technique with a phase object [7133-812]
 D. Hou, J. Yang, Suzhou Univ. (China); Y. Li, Harbin Institute of Technology (China); J. Liu, Y. Song, Suzhou Univ. (China)
- Fifect of phase valley on diffraction efficiency of liquid crystal optical phased array
 [7133-813]
 L. Xu, L. Wu, J. Zhang, X. Liu, Harbin Institute of Technology (China)
- 7133 3M Driving method to reduce data refresh rate in nematic liquid crystal optical phased array
 [7133-814]
 X. Liu, J. Zhang, L. Wu, L. Xu, Harbin Institute of Technology (China)
- 7133 3N **Digital pinhole filter used for detection of confocal microscopy images** [7133-815] X. Huang, N. Liu, J. Cui, Harbin Institute of Technology (China)
- 7133 30 Improvement of lateral resolution property of differential confocal system using radial birefringent pupil filter [7133-816]
 L. M. Zou, X. Li, H. J. Zhang, X. M. Ding, Harbin Institute of Technology (China)
- 7133 3P High temperature (till 1500°C) contemporary thermal conductivity and thermal diffusivity measurements with the step flat heat source [7133-817]
 G. Bovesecchi, P. Coppa, Univ. of Rome/Tor Vergata (Italy)
- Form measurement of small cylindrical objects using two-wavelength interferometry
 [7133-818]

 A. Höink, K. Meiners-Hagen, O. Jusko, A. Abou-Zeid, Physikalisch-Technische Bundesanstalt
 (Germany)

SESSION 9 OPTOELECTRONICS SYSTEM DESIGN AND OPTOELECTRONIC INSTRUMENTS

Federation)

- 7133 3R Control of the deformation for the millimeter wave range radiotelescope mirrors [7133-901]
 I. Konyakhin, St. Petersburg State Univ. of Information Technologies, Mechanics and Optics (Russian Federation); Y. Artemenko, Lebedev Physical Institute (Russian Federation);
 A. Timofeev, St. Petersburg State Univ. of Information Technologies, Mechanics and Optics (Russian Federation)
- 7133 35 Design and test of optoelectronic system of alignment control based on CCD camera [7133-902]
 A. G. Anisimov, A. A. Gorbachyov, A. V. Krasnyashchikh, A. N. Pantushin, A. N. Timofeev, St. Petersburg State Univ. of Information Technologies, Mechanics and Optics (Russian

- 7133 3T CCD photoelectric measurements in calibrators for vehicle headlamp tester [7133-903] Y. Lu, Z. Luo, G. Yu, W. Zhu, China Jiliang Univ. (China)
- 7133 3U Design of nano-lithographic system based on phase photon sieve [7133-904]
 W. Jiang, Institute of Optics and Electronics (China) and Graduate School of the Chinese Academy of Sciences (China); S. Hu, Institute of Optics and Electronics (China)
- 7133 3V Measurement of minimum resolvable contrast based on human visual property [7133-905] Y. Zhang, Harbin Univ. of Science and Technology (China); J. Dai, Harbin Institute of Technology (China); W. Li, Harbin Univ. of Science and Technology (China)
- Design of a probe for two-dimensional small angle detection [7133-906]
 H. He, Hubei Univ. of Technology (China); X. Wang, Hubei Univ. of Technology (China) and Hubei Key Lab. of Manufacture Quality Engineering (China); Y. Zhong, Hubei Univ. of Technology (China); L. Yang, Hubei Univ. of Technology (China) and Hubei Key Lab. of Manufacture Quality Engineering (China); H. Cao, Hubei Univ. of Technology (China)
- 7133 3X Computer modeling of the optic-electronic system for deformation measurement of radio-telescope counter-reflector [7133-907]
 I. Kaliteevskiy, I. Konyakhin, St. Petersburg State Univ. of Information Technologies, Mechanics and Optics (Russian Federation)
- 7133 3Y Universal opto-electronic measuring modules in distributed measuring systems [7133-908] S. Yaryshev, I. Konyakhin, A. Timofeev, St. Petersburg State Univ. of Information Technologies, Mechanics and Optics (Russian Federation)
- 7133 3Z
 Solar micro-power system for self-powered wireless sensor nodes [7133-909]
 Y. He, Beijing Institute of Technology (China) and Chuxiong Normal Univ. (China); Y. Li, L. Liu,
 L. Wang, Beijing Institute of Technology (China)
- 7133 40 Conformal optical design using counterrotating wedges and Zernike Fringe Sag surfaces
 [7133-910]
 Y. Li, L. Li, Y. Huang, Beijing Institute of Technology (China)
- 7133 41 Design and modal analysis of optical and mechanical structures of a space infrared camera [7133-911]
 G. Zhang, D. Sun, F. Long, Harbin Institute of Technology (China)
- Synchronization of binocular motion parameters optoelectronic measurement system [7133-912]
 L. Zhang, D. Ye, R. Che, G. Chen, Harbin Institute of Technology (China)

L. Zhàng, D. Te, K. Che, G. Chen, Haibin Insinole of fechnology (China)

- 7133 43 Calculations of backscattering optics characteristic of soot particles [7133-913]
 J. Xing, Harbin Institute of Technology (China) and Harbin Engineering Univ. (China); X. Sun,
 X. Qian, Harbin Institute of Technology (China)
- Reconstruction of temperature field Ar plasma jet using CCD spectrum tomography technology [7133-914]
 J. Xing, Harbin Engineering Univ. (China) and Harbin Institute of Technology (China); X. Qi, Harbin Engineering Univ. (China); X. Sun, Harbin Institute of Technology (China)

SESSION 10 NANOTECHNOLOGY AND MEMS

7133 45	Dimensional nanometrology at the National Physical Laboratory [7133-951]
	A. Yacoot, R. Leach, B. Hughes, C. Giusca, C. Jones, A. Wilson, National Physical Lab. (United
	Kingdom)

- 7133 46 Interferometry at the PTB Nanometer Comparator: design, status and development [7133-952]
 J. Flügge, C. Weichert, H. Hu, R. Köning, H. Bosse, A. Wiegmann, M. Schulz, C. Elster, R. D. Geckeler, Physikalisch-Technische Bundesanstalt (Germany)
- 7133 47 DLC films as anti-stiction coatings for MEMS [7133-953] X. Li, C. Zhang, J. Liu, Shenyang Univ. of Technology (China)
- F. Wang, H. Zhang, S. Deng, Hefei Univ. of Technology (China); H. Zeng, Anhui Changjiang Institute of Metrology (China)
- 7133 49 **Direct methanol fuel cell stack based on MEMS technology** [7133-955] Y. Zhang, X. Tang, Z. Yuan, Harbin Institute of Technology (China); X. Liu, Harbin Institute of Technology (China) and Ministry of Education (China)
- 7133 4A Experimental investigation of CO2 bubbles behavior in the anode flow fields of a micro direct methanol fuel cell [7133-956]
 B. Zhang, Y. Zhang, P. Zhang, X. Liu, Harbin Institute of Technology (China)
- 7133 4B **Design and fabrication of a novel portable passive DMFC stack** [7133-957] P. Zhang, Y. Zhang, B. Zhang, L. Wang, X. Liu, Harbin Institute of Technology (China)
- 7133 4C Basic research on micro-nano-instruments by femtosecond laser ablation on metal surface [7133-958]
 X. Ni, Tianjin Univ. of Technology and Education (China) and Tianjin Univ. (China); R. Hong, Tianjin Univ. of Technology and Education (China); Q. Sun, C. Wang, L. Chai, W. Jia, Tianjin Univ. (China)
- Simulation of forces on Mie micro-particles in laser trap [7133-959]
 X. Wang, China Jiliang Univ. (China); J. Bai, Zhejiang Univ. (China); T. Guo, B. Fang, China Jiliang Univ. (China)
- 7133 4E Nanometer-scale manipulator and ultrasonic cutter using an atomic force microscope controlled by a haptic device [7133-960]
 F. Iwata, S. Kawanishi, A. Sasaki, Shizuoka Univ. (Japan); H. Aoyama, The Univ. of Electro-Communications (Japan); T. Ushiki, Niigata Univ. (Japan)
- 7133 4F Experimental study of nanometrological AFM based on 3-D F-P interferometers [7133-961] Y. Huang, R. Zhu, China Jiliang Univ. (China)
- 7133 4G **Portable UV absorbance detection system for microchip electrophoresis** [7133-962] L. Tian, W. J. Wang, X. Liu, Y. Song, S. Lu, Harbin Institute of Technology (China)

- 7133 4H **Compensation of motion error in a high accuracy AFM** [7133-963] Y. Cui, Y. Arai, G. He, T. Asai, W. Gao, Tohoku Univ. (Japan)
- An atomic force microscopy study on fouling characteristics of modified PES membrane in submerged membrane bioreactor for domestic wastewater treatment [7133-964]
 S. Liu, Harbin Institute of Technology (China) and Harbin Normal Univ. (China); H. Han, Harbin Institute of Technology (China); Y. Liu, Beijing Univ. of Chemical Technology (China); B. Wang, Harbin Institute of Technology (China)
- 7133 4J A diffraction grating scale for long range and nanometer resolution [7133-965] K. Fan, B. Li, C. Liu, National Taiwan Univ. (Taiwan)
- 7133 4K A new fiber Bragg grating based accelerometer [7133-966] Y. Wang, R. Wang, F. Li, Y. Liu, Institute of Semiconductors (China)
- A multi-function tribological probe microscope with a hot tip for thermal measurement [7133-967]
 Z. Yue, X. Liu, Z. Cai, Univ. of Warwick (United Kingdom); P. Cai, Shanghai Jiao Tong Univ. (China)
- 7133 4M Estimation of magnetic nano-particles' size distribution using their magnetization curve [7133-968]
 M. Zhou, W. Liu, L. Kona, Huazhong Univ. of Science and Technology (China)
- 7133 4N Simulation of filling characteristics during hot embossing of polymer microstructures [7133-969]

P. Jin, Y. Gao, T. Liu, Harbin Institute of Technology (China)

7133 40 **Development of high-temperature piezoresistive pressure sensor based silicon on insulator** [7133-970]

S. Pang, Shenyang Academy of Instrumentation Science (China); X. Li, Shenyang Academy of Instrumentation Science (China) and Shenyang Univ. of Technology (China); Q. Liu, K. Xu, Shenyang Academy of Instrumentation Science (China)

Author Index

ISIST 2008 Committee Members

Honorary Committee

Honorary Presidium

Academician Guofan Jin (Beijing, China) Academician Liding Wang (Dalian, China) Academician Tongbao Li (Shanghai, China) Academician Shanglian Huang (Chongqing, China) Academician Zhonghua Zhang (Beijing, China) Prof. Graham J. Davies (United Kingdom) Academician Jie Gao (Chengdu, China) Academician Shenghua Ye (Tianjin, China) Prof. D.J. Whitehouse (United Kingdom) Prof. Zhu Li (Wuhan, China) Prof. Chaokuang Chen (Taipei, China) Prof. Volker Hans (Germany) Prof. Guoxiong Zhang (Tianjin, China) Prof. Peter Herbert Osanna (Austria) Prof. Yetai Fei (Hefei, China) Prof. Peter Rolfe (United Kingdom) **Dr. T. Vorburger** (United States) Prof. Zhaofei Zhou (Chengdu, China)

International Program Committee

Chair

Prof. Jiubin Tan, Harbin Institute of Technology (China)

Cochairs

Dr. Konrad Herrmann (Germany) Prof. Yuri V. Chugui (Russia) Prof. Ahmed Abou-Zeid (Germany) Prof. Seung-Woo Kim (Republic of Korea) Prof. Tony Wilson (United Kingdom) Prof. Guangzhao Fan (Taipei, China)

Members

Dr. Konrad Herrmann (Germany) Prof. Francesco Righini (Italy) Prof. P. H. J. Schellekens (Holland) Prof. Norihiro Umeda (Japan) Dr. Otto Jusko (Germany) Prof. Yunjiang Rao (Chengdu, China) Prof. Valery Kavepanov (Ukraine) Prof. Satoshi Kiyono (Japan) Mr. J. F. Song (United States) Prof. Klaus Meissner (Germany) Dr. X. P. Liu (United Kingdom) Prof. Wenmei Hou (Shanghai, China) Prof. Senyung Lee (Tainan, China) Prof. Wei Gao (Japan) Prof. Kiyoshi Takamasu (Japan) Prof. Rongqing Lin (Taipei, China) Prof. Dalwoo Kim (Republic of Korea) Prof. Guobiao Wang (Beijing, China) **Prof. Liying Wu** (Harbin, China) **Prof. X. Jiang** (United Kingdom) Prof. Michael Krystek (Germany) Prof. H. J. Pahk (Republic of Korea) Prof. Tien-I. Liu (United States) Dr. Yongsheng Gao (Hong Kong, China) Dr. Quan Chenggen (Singapore)

National Organizing Committee

Chair

Mr. Shunan Wang (Beijing, China)

Cochairs

Prof. Shulian Zhang (Beijing, China) Prof. Guangjun Zhang (Beijing, China) Prof. Hongjian Zhang (Zhejiang, China) Prof. Rensheng Che (Harbin, China) Prof. Weiqi Yuan (Shenyang, China)

Members

Prof. Jian Zhang (Harbin, China)
Prof. Xingjia Guo (Tainan, China)
Prof. Yuchi Lin (Tianjin, China)
Prof. Lijiang Zeng (Bejing, China)
Prof. Wenyuh Jywe (Taizhong, China)
Prof. Yanqiu Li (Beijing, China)
Prof. Fengzhou Fang (Tianjin, China)

Prof. Qi Wang (Harbin, China)
Prof. Lei Wang (Shanghai, China)
Prof. Junbi Liao (Chengdu, China)
Prof. Jingmin Dai (Harbin, China)
Prof. Haijun Zhang (Hangzhou, China)
Prof. Yinhan Gao (Changchun, China)
Prof. Jinwei Sun (Harbin, China)
Prof. Tianquan Fan (Chengdu, China)

Secretaries-General

Prof. Xianfang Wen (Harbin, China) Prof. Peng Jin (Harbin, China)

Deputy Secretary-General

Ms. Xiping Zhao (Harbin, China)

Secretaries

Ms. Chuanxi Song (Harbin, China)

Ms. Tingting Liu (Harbin, China)

Mr. Yaodong Ou (Harbin, China)

Mr. Yongsong Liu (Harbin, China)

Congratulations on the Convention of ISIST 2008

By ICMI Founding Chairman Li Zhu



It is my honor to warmly congratulate, on the behalf the International Committee on Measurements and Instrumentation (ICMI), the successful convention of the 5th International Symposium on Instrumentation Science and Technology (ISIST 2008) in Shenyang, China.

The International Committee on Measurements and Instrumentation (ICMI) was established during the Second International Symposium on Measurement Technology and Intelligent Instruments, ISMTII'93, in Wuhan, China. Since then ICMI has organized a series of ISMTII symposia around

the world: Hayama, Japan (1996), Miskolc-Lillafured, Hungary (1998), Giza-Cairo, Egypt (2001), Hong Kong, China (2003), Huddersfeld, UK (2005), and Sendai, Japan (2007).

In addition to the ISMTII series, ICMI also sponsors two young international symposia series, namely the ISIST (International Symposium on Instrumentation Science and Technology) series organized by Harbin Institute of Technology since 2000, and ISPMM (International Symposium on Precision Mechanical Measurement) organized by Heifei University of Technology since 2002. Measurement and instrumentation are closely related to each other in a multidisciplinary field since instrumentation science can create versatile instruments for precision measurements.

ICMI was organized voluntarily by the scholars and specialists working in the field of measurement and instrumentation worldwide. All Council and Board Members are either holders of professorial positions or other personalities who have distinguished themselves in the field of measurement technology and actively participated in the activities organized by ICMI. According to the Constitution of ICMI, we are expecting more young people to be put on the Council by recommendation to further expand the activities of ICMI.

I would like to take this opportunity to explain what the logo of ICMI means, the design of which originates from the Chinese proverb: "A square inside a circle." It is generally accepted among the Chinese people that square and circle are fundamental geometrics, which represent "standard and measurement," and imply the code of conduct as well. The acronym of ICMI is inside the square. The sloping semicircle represents the long-term worldwide development in this field and other connotations. The blue color of the circle means peace. The white color of the square means purity and honesty. The black color of "ICMI" means precision while the red color of the sloping semicircle means prosperity.

Finally, I wish to express my heartfelt thanks to the members of ICMI, the members of the Honorary Committee, the members of the International Program Committee and National Organizing Committee, and the Secretaries-General of ISIST 2008, for all their efforts to make this possible. My special thanks go to Prof. Jubin Tan for his outstanding contribution to the convention of this meeting. My heart-felt thanks also go to Harbin Institute of Technology for its firm support of this meeting.

We are now gathering here to promote academic exchanges and to advance international cooperation in the field of instrumentation science and technology. I am sure you will find this meeting interesting and informative.

Prof. Li Zhu

Founding Chairman of ICMI Huazhong University of Science and Technology, Wuhan, China

tigh 杏 柱

Preface



The International Symposium on Instrumentation Science and Technology (ISIST) is an international symposium series held every other year in different cities of China from the year 2000 onward. Its sponsors include the International Committee on Measurements and Instrumentation (ICMI), National Natural Science Foundation of China (NSFC), Chinese Society for Measurement (CIM), and China Instrumentation Society (CIS). Its purpose is to promote international academic exchanges and to advance international cooperation in the field of instrumentation science and technology.

We held ISIST 2000 in Luoyang, Henan Province with some friends from the U.K. and Germany. A large number of attendees from the U.K., Germany, Russia, Italy, Japan, Republic of Korea, Singapore and many other countries presented themselves at ISIST 2002 when we held it in Jinan, Shandong Province. Many representatives from well-known universities and well-established research institutions inside and outside China attended ISIST 2004 held in Xi'an, Shanxi Province and ISIST 2006 held in Harbin, Heilongjiang Province. This conference remained attractive to the world community of instrumentation science and technology because it had become a platform for Chinese and foreign research workers to display and share their achievements in scientific researches. The statistics we gathered indicated these meetings promoted academic exchanges between Chinese and foreign research workers and advanced many international cooperation programs between Chinese and foreign well-known universities and well-established research institutions.

So, we made the first announcement and call for papers for ISIST 2008. We signed an agreement with SPIE for the publication of the proceedings of ISIST 2008. We had the great honor to invite Prof. Jose Sasian (University of Arizona), Prof. Duncan T. More (University of Rochester), Prof. Stephen Y. Chou (Princeton University), Prof. Tony Wilson (The University of Oxford), Dr. Ahmed Abou-Zeid (PTB), Prof. Seung-woo Kim (KAIST), and Prof. Zhang Shulian (Tsinghua University), to give invited presentations at the plenary session of ISIST 2008.

We screened and peer reviewed about 287 abstracts and selected 166 papers for publication in the SPIE proceedings of ISIST 2008.

184 people attended ISIST 2008 held in Shenyang, Liaoning Province, September 16-18, 2008. Seven well-accomplished scientists gave state-of-the art presentations in their fields, ranging from microscopy to optical design, through to gradient-index materials and optical precision metrology. A total of 90 papers was orally presented at the specialist sessions covering a wide range of subjects related to instrumentation science and technology. All these presentations not only enabled the attendees to have a good understanding of the problems to be solved in the field of instrumentation science and technology, but also showed them the ways to find solutions to these problems. So, we think we have fulfilled our goal for ISIST 2008. While we are expressing our heart-felt thanks to all the participants for their efforts to make ISIST 2008 a good success, our special thanks go to SPIE for all the great help it kindly offered.

It was officially announced at the closing ceremony of ISIST 2008 that the enlarged meeting of the ISIST organizing committee had decided to hold ISIST 2010 in Hangzhou, Zhejiang Province. Communication enhances mutual understanding. Let us keep in touch with each other and meet again at the next ISIST.

> Jiubin Tan Chairman, ISIST 2008 Organizing Committee

Tamjuli_