

PROCEEDINGS OF SPIE

*International Symposium on
Photoelectronic Detection and Imaging 2009*

Advances in Infrared Imaging and Applications

**Jeffery Puschell
Hai-mei Gong
Yi Cai
Jin Lu
Jin-dong Fei**
Editors

**17–19 June 2009
Beijing, China**

Organized by
Tianjin Jinhang Institute of Technical Physics, CASIC (China)

Sponsored by
Photoelectric Technology Professional Committee, Chinese Society of Astronautics (China)

Published by
SPIE

Part One of Two Parts

Volume 7383

Proceedings of SPIE, 0277-786X, v. 7383

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 *International Symposium on Photoelectronic Detection and Imaging 2009: Advances in Infrared Imaging and Applications*, edited by Jeffery Puschell, Hai-mei Gong, Yi Cai, Jin Lu, Jin-dong Fei, Proceedings of SPIE Vol. 7383 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 0277-786X
ISBN 9780819476647

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.



SPIDigitalLibrary.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

xix	Conference Committee
xxi	Symposium Committee
xxiii	Introduction
xxv	Cooperating Organizations

Part One

ADVANCES IN INFRARED IMAGING AND APPLICATIONS

- 7383 02 **Infrared organic/inorganic optical upconverting devices (Invited Paper)** [7383-01]
D. Ban, J. Chen, Univ. of Waterloo (Canada); M. G. Helander, Z. Lu, Univ. of Toronto (Canada); M. Graf, Univ. of Waterloo (Canada) and National Research Council Canada (Canada); A. J. SpringThorpe, P. Poole, H. C. Liu, National Research Council Canada (Canada)
- 7383 03 **Development and application of large format QWIP FPA (Invited Paper)** [7383-02]
Y.-L. Shi, Kunming Institute of Physics (China)
- 7383 04 **Method of partial vision temperature measurement by infrared thermometer (Invited Paper)** [7383-03]
G. Jin, K. Huan, X. Shi, C. Wang, Changchun Univ. of Science and Technology (China)
- 7383 05 **Flight performance of the radiant cooler for IRAS on FengYun-3 Meteorological Satellite (Invited Paper)** [7383-04]
D. Dong, X. Yang, H. Xu, Y. Zhao, Shanghai Institute of Technical Physics (China)
- 7383 06 **Quantum structure optimization for infrared detection (Invited Paper)** [7383-05]
N. Li, H. Zhen, W. Wang, J. Wang, X. Chen, Z. Li, Shanghai Institute of Technical Physics (China); W. Wang, H. Chen, Institute of Physics (China); F. Liu, Institute of Semiconductors (China); W. Lu, Shanghai Institute of Technical Physics (China)
- 7383 07 **The development and applications of space thermal infrared imaging technology (Invited Paper)** [7383-06]
W. Ma, Beijing Institute of Space Mechanics and Electricity (China)
- 7383 08 **Tracking and detection of small moving infrared target based on wavelet transform and fuzzy inference in complex dynamic background** [7383-07]
W. Shi, Naval Aeronautical and Astronautical Univ. (China); D. Wang, Huazhong Univ. of Science and Technology (China); N. Wang, Naval Aeronautical and Astronautical Univ. (China)
- 7383 09 **A new method of dual FOV optical system design** [7383-08]
L. Zhang, Electro-optical Equipment Research Institute (China)

- 7383 0A **An approach to integrate the human vision psychology and perception knowledge into image enhancement** [7383-09]
H. Wang, X. Huang, Institute of Optics and Electronics (China) and Graduate Univ. of Chinese Academy of Sciences (China); J. Ping, Institute of Optics and Electronics (China)
- 7383 0B **The study of infrared target recognition at sea background based on visual attention computational model** [7383-10]
D. Wang, T. Zhang, Huazhong Univ. of Science and Technology (China); W. Shi, Naval Aeronautical and Astronautical Univ. (China); L. Wei, X. Wang, G. Ao, Huazhong Univ. of Science and Technology (China)
- 7383 0C **Infrared radiation with deformation of bolt and rock** [7383-11]
Y. Ji, Qingdao Univ. of Science and Technology (China)
- 7383 0D **Experimental measurement for the degree of athermalization of IR optical systems** [7383-12]
S. Chen, Z. Fan, H. Chang, Harbin Institute of Technology (China)
- 7383 0E **Edge continuity of infrared image for ground scene** [7383-13]
Z. Zhang, Harbin Institute of Technology (China) and Tianjin Jinhang Institute of Technical Physics (China); S. Xu, Harbin Institute of Technology (China)
- 7383 0F **Real-time implementation of multi-point nonuniformity correction for IRFPA based on FPGA** [7383-14]
L. Miao, Q. Xu, M. Zhang, D. Sun, Y. Liu, Shanghai Institute of Technical Physics (China)
- 7383 0G **Pulsed phase thermography for defect detection of honeycomb structure** [7383-15]
Y. Zhang, L. Feng, Y. Li, C. Zhang, Capital Normal Univ. (China)
- 7383 0H **Optimization of (100)-Si TMAH etching for uncooled infrared detector** [7383-16]
Y. Shuai, C. G. Wu, W. L. Zhang, Y. R. Li, X. Z. Liu, J. Zhu, Univ. of Electronic Science and Technology (China)
- 7383 0I **Analysis of carriers transportation of novel GaAs/AlGaAs quantum well infrared photodetectors** [7383-17]
D. Li, J. Deng, N. Ma, J. Li, B. Wang, Beijing Univ. of Technology (China)
- 7383 0J **Orthogonal wave-front coding for range information extraction from a single image** [7383-18]
J. Kang, H. Chen, Z. Tan, Huazhong Univ. of Science and Technology (China)
- 7383 0K **Infrared imaging characterization of ground scene** [7383-19]
Z. Zhang, Harbin Institute of Technology (China) and Tianjin Jinhang Institute of Technical Physics (China); S. Xu, Tianjin Jinhang Institute of Technical Physics (China)
- 7383 0L **Computation of inner surface temperature based on infrared temperature measurement** [7383-20]
C. Cao, X. Zhang, S. Li, North China Electric Power Univ. (China)

- 7383 OM **A new method on improving the temperature operating characteristic of the uncooled infrared detector** [7383-21]
Y. Zhang, The China Aerospace Industry Corp. (China); Z. Yin, The Equipment Technology Institute of the Navy (China); J. Qin, The China Aerospace Industry Corp. (China)
- 7383 ON **Analysis of polarimetric scattering for backgrounds and camouflage materials** [7383-22]
C. Zhang, H. Cheng, Z. Chen, W. Zheng, National Univ. of Defense Technology (China)
- 7383 OO **Application of support vector machines in cloud detection using EOS/MODIS** [7383-23]
Y. He, PLA Univ. of Science and Technology (China); H. Wang, Key Lab. of Regional Climate-Environment in Temperate Eastern Asia (China); H. Guan, PLA Univ. of Science and Technology (China)
- 7383 OP **Athermalization and test validation of infrared imaging system** [7383-24]
Q. Huang, Y. Chen, Z. Gao, X. Zhai, B. Song, Southwest Institute of Technical Physics (China)
- 7383 OQ **A fully-digital processing approach in an infrared target detection system** [7383-25]
L. Qiu, L. Xu, J. Qi, B. Li, J. Yang, Fourth Military Medical Univ. (China)
- 7383 OR **Study of defog technology based on scattering model with laser imaging night vision assistant driving system** [7383-26]
H. Liu, Institute of Semiconductors (China) and Kunming Univ. of Science and Technology (China); Y. Zhou, X. Wang, Institute of Semiconductors (China)
- 7383 OS **Real-time implementation of visible and infrared image fusion and new measure based on spectral information** [7383-27]
Y. Yuan, B. Chang, J. Zhang, S. Tian, Y. Han, Nanjing Univ. of Science and Technology (China)
- 7383 OT **Correction of the non-uniformity of the radiometric detector of WSICMS** [7383-28]
X. Sun, PLA Univ. of Science and Technology (China); J. Liu, Unit 68028 of PLA (China)
- 7383 OU **Fuzzy clustering of infrared images applied in air leak localization** [7383-29]
N. Ge, G. Peng, Beijing Institute of Technology (China); M. Jiang, Univ. of Rochester (United States)
- 7383 OV **Leukemic cells segmentation algorithm based on molecular spectral imaging technology** [7383-30]
Q. Li, C. Dai, H. Liu, J. Liu, East China Normal Univ. (China)
- 7383 OW **Infrared point target detection based on exponentially weighted RLS algorithm and dual solution improvement** [7383-31]
B. Zhu, Hefei Electronic Engineering Institute (China); X. Fan, Univ. of Sciences and Technology (China); D. Ma, Z. Cheng, Hefei Electronic Engineering Institute (China)
- 7383 OX **The research of anti-jamming image enhancement method of infrared imaging system** [7383-32]
Y. Li, J. Yan, Beijing Institute of Technology (China) and China North Industries Group (China)
- 7383 OY **Multi-target track based on mixtures of particle filtering** [7383-33]
S. Li, Z. Zhu, National Lab. of Target and Environment Optical Features (China)

- 7383 0Z **Three-dimensional shape reconstruction of breaking surface for impact process** [7383-34]
Y. Xiao, China Three Gorges Univ. (China); X. Hong, Henan Institute of Sciences and Technology (China)
- 7383 10 **Laser welding quality of motors inspected by lock-in infrared thermography** [7383-35]
Y. Huo, Y. Zhao, Beijing Institute of Technology (China); C. Zhang, D. Chen, Capital Normal Univ. (China)
- 7383 11 **Spectral calibration of the space-borne infrared imaging Fourier transform spectrometer** [7383-36]
P. Liu, Z. Wang, P. Wang, J. Hua, Shanghai Institute of Technical Physics (China)
- 7383 12 **A new interpolation arithmetic based readout signals process method for infrared imaging system applications** [7383-37]
X. Li, S. Yao, Y. Zhao, Tianjin Univ. (China)
- 7383 13 **Fabrication of Ge-Se-Sb chalcogenide glass with large size and its MTF performance** [7383-38]
S. Dai, Ningbo Univ. (China) and Xi'an Institute of Optics and Precision Mechanics (China); M. Li, Kunming IR-Optics Technology Co. Ltd. (China); B. Peng, Xi'an Institute of Optics and Precision Mechanics (China); J. Zhu, X. Wang, X. Shen, Ningbo Univ. (China); L. Ding, Kunming IR-Optics Technology Co. Ltd. (China); T. Xu, Q. Nie, Ningbo Univ. (China)
- 7383 14 **A novel plane method to the calibration of the thermal camera** [7383-39]
X. Wang, Ningbo Univ. (China); W. Huang, Hangzhou Teacher College (China); Q. Nie, T. Xu, S. Dai, X. Shen, Ningbo Univ. (China); W. Cheng, Beihang Univ. (China)
- 7383 15 **Detection algorithm for IR ship target in complex background of sea and sky** [7383-40]
X. Wang, T. Zhang, D. Wang, Huazhong Univ. of Science and Technology (China); W. Shi, Naval Aeronautical and Astronautical Univ. (China)
- 7383 16 **Numerical computation of modulated factor in measuring D^*** [7383-41]
X. He, Y. Zhang, Y. Zhang, H. Tang, Shanghai Institute of Technical Physics (China)
- 7383 17 **Adaptive small target detection based on evaluating complex degree of infrared image** [7383-42]
Q. Hou, W. Zhang, C. Wu, Q. Li, L. Lu, Y. Cao, Harbin Institute of Technology (China)
- 7383 18 **Modeling and simulation of infrared radiation from rocket plume at boosting stage** [7383-43]
Q. Ye, X. Sun, Y. Zhang, C. Zhang, L. Shao, Y. Wang, Hefei Electronic Engineering Institute (China)
- 7383 19 **Effect on infrared imaging seeker's target tracking of missile's attitude changes** [7383-44]
X. Wang, H. Lin, Beijing Institute of Technology (China)
- 7383 1A **Research of thermal cycles of long wavelength MCT infrared detectors** [7383-45]
L. Wu, Ningbo Univ. (China); D. Liu, S. Zhu, H. Gong, Shanghai Institute of Technical Physics (China)

- 7383 1B **Design of the infrared dual-band athermalized optical system based on HDE** [7383-46]
K. Dong, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate School of the Chinese Academy of Sciences; L. Zhang, Office of PLA 2nd Artillery in Beijing (China); J. Wang, Changchun Institute of Optics, Fine Mechanics and Physics (China); H. Wang, Office of PLA 2nd Artillery in Beijing (China); Q. Sun, Z. Lu, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 7383 1C **Study on color image tracking and detection algorithms based on particle filter** [7383-47]
C. Wu, H. Sun, Changchun Institute of Optics, Fine Mechanics and Physics (China); D. Yang, Changchun Univ. of Technology (China)
- 7383 1D **Multi-spectral optical simulation system applied in hardware-in-the-loop** [7383-48]
H. Yu, J. Lei, Y. Gao, Y. Liu, Beijing Simulation Ctr. (China)
- 7383 1E **The experimentation research of IR imaging system capability affected by sapphire window's pneumatic calefaction** [7383-49]
Y. Liu, G. Pan, Y. Zhang, Luoyang Optoelectro Technology Development Ctr. (China)
- 7383 1F **Feasibility study on sub-pixel detection technique applied in 3.5 μ m band on multi-channel scanning imagery radiometer of geosynchronous orbit meteorological satellite FY-4** [7383-50]
B. Chen, China Meteorological Administration (China) and Shanghai Institute of Technical Physics (China); G. Wang, Shanghai Institute of Technical Physics (China); Q. Guo, China Meteorological Administration (China); G. Chen, X. Wen, Shanghai Institute of Technical Physics (China); J. Yu, Shanghai Institute of Technical Physics (China) and Hangzhou Dianzi Univ. (China); F. Chen, Shanghai Institute of Technical Physics (China)
- 7383 1G **Method and apparatus for enhancing surface absorption and emissivity in optical pulsed infrared nondestructive evaluation** [7383-51]
Y. Duan, Beijing Univ. of Aeronautics and Astronautics (China); C. Zhang, W. Jin, Capital Normal Univ. (China); N. Wu, Beijing Univ. of Aeronautics and Astronautics (China)
- 7383 1H **The new null testing method for the special optical window** [7383-52]
C. Huang, Henan Polytechnic Institute (China)
- 7383 1I **Moving target detection based on temporal-spatial information fusion for infrared image sequences** [7383-53]
W. Toing, J. Xiong, A. Zeng, X. Wu, Southwest Electronics and Telecommunication Technology Research Institute (China); H. Xu, Researcher (China)
- 7383 1J **Image segmentation and object recognition based on bidirectional scanning fusion technique** [7383-54]
H. Xu, Researcher (China); W. Toing, Southwest Electronics and Telecommunication Technology Research Institute (China); W. Fan, The Jiu Hui Technology Corp. (China); J. Xiong, Southwest Electronics and Telecommunication (China)
- 7383 1K **A novel common aperture optical system for MWIR/SWIR polarization imager** [7383-55]
H. He, J. Zhao, S. Pan, Y. Cai, Kunming Institute of Physics (China)

- 7383 1L **Study on key technologies of uncooled infrared focal plane array** [7383-56]
R. Wang, X. Yang, A. E. W. Wu, B. Xiao, Artillery Commanding Academy (China)
- 7383 1M **Surface temperature distribution and infrared radiation feature of a spatial balloon decoy** [7383-57]
X. Wu, X. Lv, H. Yang, C. Huang, Hefei Electronic Engineering Institute (China)
- 7383 1N **Research and development on performance models of thermal imaging systems** [7383-58]
J. Wang, W. Jin, X. Wang, Y. Cheng, Beijing Institute of Technology (China)
- 7383 1O **Stray light in infrared detector** [7383-59]
Y. Zhang, D. Liu, X. He, X. Wang, K. Zhang, H. Tang, T. Li, Shanghai Institute of Technical Physics (China)
- 7383 1P **Quantum well infrared photodetector simultaneously working in the two atmospheric windows** [7383-60]
Y. H. Huo, W. Q. Ma, Y. H. Zhang, M. Chong, T. Yang, L. H. Chen, Institute of Semiconductors (China); Y. L. Shi, Kunming Institute of Physics (China)
- 7383 1Q **The fabrication of a 128×128 solar-blind AlGaIn p-i-n back-illuminated ultraviolet photodetector array** [7383-61]
T. Yan, M. Chong, D. Zhao, S. Zhang, L. Chen, Institute of Semiconductors (China)
- 7383 1R **Improved method of parameters identification and restoration of motion blurred image** [7383-62]
G. Xu, D. Zhu, B. Wang, Y. Cheng, J. Wang, Y. Tian, Nanjing Univ. of Aeronautics and Astronautics (China)
- 7383 1S **A search of the research on soldier-in-the-loop target acquisition performance modeling of infrared imaging system** [7383-63]
J. Zhang, Beijing Institute of Technology (China); H. Li, Armored Force Engineering Institute (China); B. Li, Artillery and Antiaircraft force Equipment Technological Research Institute (China); J. Yan, ChinaNorth Industries Group Corp. (China)
- 7383 1T **Photo-excited carrier density in short-period InAs/GaSb type-II superlattice** [7383-64]
F. Li, Kunming Institute of Physics (China); W. Xu, Institute of Solid State Physics (China); Y. Shi, Kunming Institute of Physics (China)
- 7383 1U **Study on design of infrared cooperative marker and extraction method of random irregular cross** [7383-65]
G. Jiang, Z. Chao, S. Fu, National Univ. of Defense Technology (China); R. Shen, SimpLight Nanoelectronics Co. Ltd. (China); S. Wang, National Univ. of Defense Technology (China)
- 7383 1V **Research and design of high speed mass image storage system** [7383-66]
Y. Li, R. Xue, F. Liang, Shenyang Institute of Aeronautical Engineering (China)
- 7383 1W **Infrared thermal wave nondestructive testing for rotor blades in wind turbine generators non-destructive evaluation and damage monitoring** [7383-67]
S. Zhao, Beijing Univ. of Aeronautics and Astronautics (China); C. Zhang, Capital Normal Univ. (China); N. Wu, Y. Duan, H. Li, Beijing Univ. of Aeronautics and Astronautics (China)

- 7383 1X **Method for fabricating Au-Al_{0.30}Ga_{0.70}N lateral Schottky photodiode** [7383-68]
C. Cheng, Z. Lu, I. Zhao, J. Ding, J. Si, W. Sun, Luoyang Optoelectronic Institute (China)
- 7383 1Y **Application of ultrasonic infrared thermography on the evaluation of CFRP foam sandwich structure** [7383-69]
P. Zou, L. Feng, Y. Li, C. Zhang, C. Xing, D. Chen, Capital Normal Univ. (China)
- 7383 1Z **Analysis of crosstalk in front-illuminated InGaAs PIN hetero-junction photovoltaic infrared detector arrays** [7383-70]
Y. Li, Shanghai Institute of Technical Physics (China) and Graduate School of the Chinese Academy of Sciences (China); H. Tang, Shanghai Institute of Technical Physics (China); K. Zhang, T. Li, J. Ning, Shanghai Institute of Technical Physics (China) and Graduate School of the Chinese Academy of Sciences (China); X. Li, H. Gong, Shanghai Institute of Technical Physics (China)
- 7383 20 **Application of spatial statistics for IR background suppression** [7383-71]
X. Meng, W. Zhang, M. Cong, Y. Cao, Harbin Institute of Technology (China)
- 7383 21 **Motion detection using phase-based filtering in infrared imagery** [7383-72]
W. Yu, X. Yu, Institute of Surveying and Mapping (China); Y. Zhang, Beijing Remote Sensing Institute (China); J. Liu, Institute of Surveying and Mapping (China)
- 7383 22 **Ocean color atmospheric correction method using FTIR spectrometer in Case II waters** [7383-73]
Z. Ke, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China); Y. Ma, Wuhan National Lab. for Optoelectronics (China); H. Wang, H. Wang, Huazhong Univ. of Science and Technology (China)
- 7383 23 **Infrared images simulation based on heat transfer model and random field** [7383-74]
Y. Qin, Z. Cao, Z. Song, Huazhong Univ. of Science and Technology (China)
- 7383 24 **A new template matching algorithm based on periodic stretch phase correlation** [7383-75]
G. Wang, Shenyang Institute of Chemical Technology (China) and Shenyang Institute of Automation (China); L. Qi, Shenyang Institute of Automation (China); H. Shi, Shenyang Institute of Chemical Technology (China)
- 7383 25 **New temporal high-pass filter non-uniformity correction algorithm based on change detection** [7383-76]
H. Li, X. Zhou, R. Hu, Huazhong Univ. of Science and Technology (China); J. Jia, Luoyang Institute of Electro-optical Equipment (China); G. Zhang, Huazhong Univ. of Science and Technology (China)
- 7383 26 **A real-time testing system for infrared imaging system** [7383-77]
R. Hu, X. Mou, Huazhong Univ. of Science and Technology (China); X. Pan, Luoyang Institute of Electro-optical Equipment (China); G. Zhang, Huazhong Univ. of Science and Technology (China)
- 7383 27 **The modeling and simulation of the artificial space object** [7383-78]
S. Gao, X. Tang, Y. Yu, F. Xue, Shanghai Institute of Technical Physics (China)

- 7383 28 **Design methodology for high-speed video processing system based on signal integrity analysis** [7383-79]
R. Wang, H. Zhang, Beijing Univ. of Aeronautics and Astronautics (China)
- 7383 29 **An improved fractional divider for fractional-N frequency synthesizers** [7383-80]
W. Zhang, Y. Liu, Y. Zhou, Tianjin Univ. (China)
- 7383 2A **System design and simulation of a long-wave infrared hyperspectral imaging spectrometer** [7383-81]
L. Yuan, W. Xu, Z. He, Shanghai Institute of Technical Physics (China); Y. Lin, Shanghai Institute of Technical Physics (China) and Graduate School of the Chinese Academy of Sciences (China); R. Shu, J. Wang, Shanghai Institute of Technical Physics (China)
- 7383 2B **The optical scanning technology in laser scanning and tracking system** [7383-82]
S. Li, S. Zhou, Shanghai Institute of Technical Physics (China)
- 7383 2C **An enhancement algorithm for low quality fingerprint image based on edge filter and Gabor filter** [7383-83]
J. Xue, J. Liu, Z. Liu, Tianjin Univ. (China)
- 7383 2D **A novel WDM optical filter based on volume holographic gratings recorded in transmissive-writing and orthogonal-readout scheme** [7383-84]
D. Liu, D. Wang, S. Tao, Y. Wan, Z. Jiang, Beijing Univ. of Technology (China)
- 7383 2E **IR image signature of target detection based on the morphology filter with self-adaptive optimized genetic algorithms** [7383-85]
M. Wang, Xian Yang Normal College (China); Z. Wu, Xidian Univ. (China); Y. Li, Xian Yang Normal College (China); Y. Wang, National Key Lab. of Defence Science and Technology (China)
- 7383 2F **System identification of tracking error and evaluation of tracking performance using BP neural network** [7383-86]
N. Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate School of the Chinese Academy of Sciences (China); X. Shen, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 7383 2G **A method of outdoor simulation of infrared radiance of targets** [7383-87]
J. Song, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate School of the Chinese Academy of Sciences (China); X. Shen, Changchun Institute of Optics, Fine Mechanics and Physics (China); Y. Zhao, Liaoning Shihua Univ. (China)
- 7383 2H **Watershed segmentation of infrared target based on multiscale mathematical morphology and target enhancement** [7383-88]
X. Bai, F. Zhou, T. Jin, Z. Liu, Beijing Univ. of Aeronautics and Astronautics (China)

Part Two

- 7383 2I **Structure design and simulation of uncooled infrared sensors** [7383-89]
Y. Wu, S. Yao, P. Gao, H. He, Tianjin Univ. (China)

- 7383 2J **REMS GTS: a pyrometer for Mars ground temperature measurement** [7383-90]
E. Sebastián, C. Armien, J. Gómez-Elvira, Instituto Nacional de Técnica Aeroespacial (Spain)
- 7383 2K **Modeling and analysis for infrared clutter radiance of atmospheric absorption band sensor** [7383-91]
Y. Cao, W. Zhang, M. Cong, W. Bao, X. Meng, J. Cheng, Harbin Institute of Technology (China)
- 7383 2L **Boron-doped ZnO for infrared detection** [7383-92]
W. Liu, S. Zhao, K. Zhao, W. Sun, A. Wang, China Univ. of Petroleum (China); Y. Zhou, Institute of Physics (China)
- 7383 2M **Simulation of target interpretation based on infrared image features and psychology principle** [7383-93]
W. Lin, Y. Chen, H. Gao, The Canbao Engineering Design and Research Institute of Beijing (China); Z. Wang, The Nanjing Univ. of Science and Technology (China); J. Wang, R. Su, Y. Huang, The Canbao Engineering Design and Research Institute of Beijing (China)
- 7383 2N **Design and simulation of the circuit of SWIR hyper-spectral imaging spectrometer** [7383-94]
B. Ren, Xi'an Institute of Optics and Precision Mechanics (China) and Graduate School of the Chinese Academy of Sciences (China); Z. Li, Xi'an Institute of Optics and Precision Mechanics (China); N. Meng, PLA Xi'an Communication College (China)
- 7383 2O **A DSP-based neural network non-uniformity correction algorithm for IRFPA** [7383-95]
C. Liu, W. Jin, Y. Cao, X. Liu, Beijing Institute of Technology (China)
- 7383 2P **An EW technology research of jamming IR imaging guided missiles** [7383-96]
X. Wu, H. Rong, J. Liang, Q. Chen, M. Chen, Dalian Naval Academy (China)
- 7383 2Q **A novel non-uniformity correction algorithm for parallel scan infrared imager** [7383-97]
Y. Fan, W. Jin, Beijing Institute of Technology (China); Z. Li, H. Fan, F. Yang, Kunming Institute of Physics (China)
- 7383 2R **Research of difference absorption optical fiber CO gas sensor based on FBG** [7383-98]
Y. Wang, Z. Liu, Y. Kang, Hebei Normal Univ. (China); Y. Wang, YanShan Univ. (China)
- 7383 2S **Short wave infrared InGaAs focal plane arrays detector: the performance optimization of photosensitive element** [7383-99]
X. Gao, Z. Tang, X. Zhang, Y. Chen, L. Jiang, H. Cheng, China Electronics Technology Group Corp. (China)
- 7383 2T **Simplified transfer contributions for primary aberrations of AGRIN lens** [7383-100]
C. Zhao, Luoyang Normal Univ. (China); X. Hong, Henan Institute of Science and Technology (China)
- 7383 2U **Design and analysis of the flexible support structure of a space infrared detector** [7383-101]
D. Sun, G. Zhang, N. Guo, Harbin Institute of Technology (China)

- 7383 2V **Analysis of imaging quality under the systematic parameters for thermal imaging system** [7383-102]
B. Liu, W. Jin, Beijing Institute of Technology (China)
- 7383 2W **Dynamic scene simulation technology used for infrared seeker** [7383-103]
Q. Zhou, Northwestern Polytechnical Univ. (China)
- 7383 2X **A new unified framework for object detection and tracking in infrared imagery** [7383-104]
Z. Wang, North China Electric Power Univ. (China) and Beijing Institute of Technology (China); J. Chen, Beijing Institute of Technology (China); Y. Bai, North China Electric Power Univ. (China)
- 7383 2Y **Optical testing of large rough aspheric surface using far-infrared interferometer** [7383-105]
Y. Wu, Y. Zhang, F. Wu, Institute of Optics and Electronics (China)
- 7383 2Z **Applied methods of testing and evaluation for IR imaging system** [7383-106]
X. Liao, J. Lu, Tianjin Jinhang Institute of Technical Physics (China)
- 7383 30 **An improved neural network nonuniformity correction for IRFPA** [7383-107]
Z. Liu, X. Hu, J. Lu, Tianjin Jinhang Institute of Technology Physics (China)
- 7383 31 **Nonlinear analysis for image stabilization in IR imaging system** [7383-108]
Z. Xie, J. Lu, Y. Luo, M. Zhang, Tianjin Jinhang Institute of Technical Physics (China)
- 7383 32 **Accessing the epitaxy structure of quantum well infrared photodetectors by photoluminescence measurement** [7383-109]
N. Ma, J. Deng, D. Li, Beijing Univ. of Technology (China); Y. Shi, Kunming Institute of Physics (China); G. Shen, Beijing Univ. of Technology (China)
- 7383 33 **The global optimal surface velocity field near shoreline from infrared images** [7383-110]
W. Chen, Naval Research Lab. (United States)
- 7383 34 **Experimental study of target detection by detectors with different wavebands** [7383-111]
H. Zhuo, Y. Song, L. Wang, Institute of Applied Electronics (China)
- 7383 35 **Study on algorithm for night vision panoramic image basing on image segmentation and multimode displaying technology** [7383-112]
Z. Zhang, K. Li, Beijing Institute of Technology (China)
- 7383 36 **Target location for IR image based on IR/visual image registration** [7383-113]
Z. Liu, F. Zhou, X. Bai, Beihang Univ. (China)
- 7383 37 **Infrared attenuation analysis of lognormal distribution water mist in the atmosphere windows** [7383-114]
Z. Chen, Tsinghua Univ. (China) and Naval Academy of Armament (China); X. Liang, X. Xu, Tsinghua Univ. (China); H. Wang, L. Zhang, Naval Academy of Armament (China)
- 7383 38 **Application of BRDF for modeling on the optical scattering characteristics of space target** [7383-115]
C. Sun, Y. Yuan, X. Zhang, Beijing Univ. of Aeronautics and Astronautics (China)

- 7383 39 **SoPC implementation of autofocus for infrared imaging apparatus based on retinal vision mechanism** [7383-116]
K. Gao, N. Liu, C. Sun, G. Ni, Beijing Institute of Technology (China)
- 7383 3A **An infrared imaging computation model and its validation** [7383-117]
H. Li, Beijing Institute of Technology (China) and Yunnan Normal Univ. (China); T. Bai, S. Ma, X. Lv, P. Gao, Beijing Institute of Technology (China); W. Yang, J. Feng, Yunnan Normal Univ. (China)
- 7383 3B **Real-time color image fusion for infrared and low-light-level cameras** [7383-118]
J. Zhang, Y. Han, B. Chang, Y. Yuan, Y. Qian, Y. Qiu, Nanjing Univ. of Science and Technology (China)
- 7383 3C **Influence of input target characteristics to correlation peak recognition in optical correlation system** [7383-119]
Y. Zhang, Beijing Institute of Technology (China) and Shijiazhuang Mechanical Engineering College (China); W. Jin, Beijing Institute of Technology (China)
- 7383 3D **Two-dimensional motion estimation algorithm based on correlation speed measurement for satellite remote sensing images** [7383-120]
L. Hu, Q. Li, C. Yao, Xidian Univ. (China)
- 7383 3E **The radiation characteristic of the infrared imaging hardware-in-the-loop simulation testing system** [7383-121]
Y. Zhang, Q. He, Beijing Simulation Ctr. (China)
- 7383 3F **Novel integrated readout circuit of variable integration time with background suppression for quantum dot infrared photo-detectors** [7383-122]
Y.-C. Lu, H.-L. Shieh, S.-C. Hung, T.-P. Sun, M.-L. Sheu, National Chi Nan Univ. (Taiwan); S.-F. Tang, C.-D. Chiang, Chungshan Institute of Science & Technology (Taiwan)
- 7383 3G **Scene-based nonuniformity correction with motion detection** [7383-123]
X. Mou, G. Zhang, R. Hu, H. Li, Huazhong Univ. of Science and Technology (China)
- 7383 3H **Robust infrared targets tracking with covariance matrix representation** [7383-124]
J. Cheng, Univ. of Electronic Science and Technology of China (China)
- 7383 3I **Water body extraction in urban region from high resolution satellite imagery with near-infrared spectral analysis** [7383-125]
L. Zhao, Honghe Univ. (China); H. Yu, China Institute of Water Resources and Hydropower Research (China); L. Zhang, China Univ. of Mining & Technology (China)
- 7383 3J **Research on probability of target acquirement of infrared imaging seeker under different search laws** [7383-126]
X. Wang, H. Lin, Beijing Institute of Technology (China)
- 7383 3K **Compression of multispectral images using spectral correlation and SPIHT algorithm** [7383-127]
L. Ma, Z. Shi, Shenyang Institute of Automation (China); Y. Chen, Shenyang Institute of Automation (China) and Graduate School of Chinese Academy of Sciences (China); X. Tang, Shenyang Institute of Automation (China)

- 7383 3L **Design of readout circuit for microcantilever infrared focal plane array with snapshot integration** [7383-128]
K. Lei, Z. Chen, J. Cao, Y. Zhang, W. Lu, L. Ji, Peking Univ. (China)
- 7383 3M **The research of conformal optical design** [7383-129]
L. Li, Y. Li, Y. Huang, B. Du, Beijing Institute of Technology (China)
- 7383 3N **Relationship between dark conductivity and temperature for amorphous HgCdTe films** [7383-130]
L. Yu, Y. Shi, W. He, G. Deng, F. Li, R. Kang, Kunming Institute of Physics (China)
- 7383 3O **Images and evaluation of middle-wave infrared polarization imaging system** [7383-131]
C. Xu, L. Su, G. Yang, J. Zhao, Y. Cai, S. Pan, Kunming Institute of Physics (China)
- 7383 3P **Temperature dependence of photoconductivity for amorphous HgCdTe films** [7383-132]
G. Deng, Y. Shi, L. Yu, J. Zhuang, M. Peng, X. Li, L. Yang, F. Li, G. Wang, Kunming Institute of Physics (China)
- 7383 3Q **The research of underground coal fires based on thermal infrared images** [7383-133]
W. Chen, Xi'an Univ. of Science and Technology (China)
- 7383 3R **Simulation of doping concentration and working temperature for MCT photodiode detector design** [7383-134]
Y. Tian, Kunming Univ. of Science and Technology (China) and Kunming Institute of Physics (China); Y. Shi, F. Li, Kunming Institute of Physics (China)
- 7383 3S **Automatic target recognition algorithm based on statistical dispersion of infrared multispectral image** [7383-135]
W. Zhang, L. Cao, C. Wu, Q. Hou, Harbin Institute of Technology (China)
- 7383 3T **Tank target recognition used in infrared imaging fuze based on FPGA** [7383-136]
M. Chen, K. Wang, C. Song, Y. Jiang, Beijing Institute of Technology (China)
- 7383 3U **Research on CFRP materials nondestructive testing by IR lock-in thermography** [7383-137]
J. Liu, Y. Wang, H. Liu, Y. He, Harbin Institute of Technology (China)
- 7383 3V **An image fusion algorithm based on regional Kullback-Leibler entropy and nonsubsamped contourlet transform** [7383-138]
S. Liu, Q. Hao, Y. Song, Y. Hu, Beijing Institute of Technology (China)
- 7383 3W **Multiple cues fusion for object tracking with particle filter in infrared image** [7383-139]
T. Jin, F. Zhou, X. Bai, K. Chen, Beijing Univ. of Aeronautics and Astronautics (China)
- 7383 3X **A kind of phase-based image matching technique** [7383-140]
Z. Xiao, J. Wu, L. Geng, J. Wang, N. Xu, Tianjin Polytechnic Univ. (China)
- 7383 3Y **Studies of RF magnetron sputtered amorphous HgCdTe films** [7383-141]
J. Kong, S. Wang, L. Kong, J. Zhao, Y. Ma, G. Wang, X. Li, L. Yang, P. Zhang, R. Ji, Kunming Institute of Physics (China)

- 7383 3Z **Low frequency noise characteristics of extended wavelength InGaAs infrared detector** [7383-142]
T. Li, K. Zhang, Y. Li, Shanghai Institute of Technical Physics (China) and Graduate School of the Chinese Academy of Sciences (China); H. Tang, X. Li, H. Gong, Shanghai Institute of Technical Physics (China)
- 7383 40 **Multispectral imagery registration based on minor and noise component criterion** [7383-143]
J. Cui, Harbin institute of technology (China) and Harbin Engineering Univ. (China); X. Zhang, L. Li, Harbin Engineering Univ. (China)
- 7383 41 **An efficiency restoration method for turbulence-degraded image base on improved SeDDaRA method** [7383-144]
H. Zuo, Q. Zhang, R. Zhao, Institute of Optics and Electronics (China)
- 7383 42 **Analysis of the influence of conducting mesh for infrared optical system** [7383-145]
Y. Wang, Communication Univ. of China (China)
- 7383 43 **An algorithm for detecting small and dim target in IR image based on reconstruction from wavelet transform modulus** [7383-146]
X. Li, C. Shi, E. Mao, Beijing Institute of Technology (China)
- 7383 44 **Nonuniformity analyses of IRFPA with DI readout circuit** [7383-147]
W. Wang, Northwestern Polytechnical Univ. (China) and Luoyang Opto-electro Technology Development Ctr. (China); Y. Fan, Northwestern Polytechnical Univ. (China); Q. Guo, J. Liu, Luoyang Opto-electro Technology Development Ctr. (China)
- 7383 45 **An efficient approach to extraction ROI from infrared image sequence** [7383-148]
Q. Chen, X. Xie, T. Guo, S. Yuan, Naval Aeronautical and Astronomical Univ. (China)
- 7383 46 **Time-delay recurrent neural network for exo-atmospheric infrared target recognition** [7383-149]
T. Liu, J. Lv, S. Wong, X. Li, National Univ. of Defense Technology (China)
- 7383 47 **Structural properties analysis of CdTe thin films deposited by magnetron sputtering** [7383-150]
L. Kong, J. Zhao, J. Kong, Y. Shi, R. Ji, Kunming Institute of Physics (China)
- 7383 48 **Fast non-parametric background subtraction for infrared surveillance** [7383-151]
S. Ge, T. Xu, G. Ni, Beijing Institute of Technology (China)
- 7383 49 **Research on extinction characteristics of polaroids in near-infrared region** [7383-152]
H. Liu, J. Wu, J. Wang, C. Zhu, H. Yu, X. Yan, Xi'an Polytechnic Univ. (China)
- 7383 4A **A neural network non-uniformity correction algorithm for IRFPA** [7383-153]
M. Zhu, Beijing Institute of Technology (China); Y. Yang, Univ. of Science and Technology (China)
- 7383 4B **Hyperspectral image classification by collaboration of spatial and spectral information** [7383-154]
Y. Yan, Y. Zhao, H. Xue, X. Kou, Y. Liu, Northwestern Polytechnical Univ. (China)

- 7383 4C **Tracking algorithm design and precision analysis of space object measure for orbiting optical camera** [7383-155]
J. Cheng, W. Zhang, Y. Cao, M. Cong, H. Pan, Harbin Institute of Technology (China)
- 7383 4D **Analysis of surface and bulk effects in HgCdTe photodetector arrays by variable-area diode test structures** [7383-156]
Y. Deng, Shanghai Institute of Technical Physics (China) and Graduate School of the Chinese Academy of Sciences (China); C. Lin, X. Hu, Shanghai Institute of Technical Physics (China)
- 7383 4E **Detection of infrared small targets in a starry background** [7383-157]
J. Cui, D. Qi, X. Ma, Northeast Forestry Univ. (China)
- 7383 4F **The analysis of super-resolution reconstruction of linear rotate-scanning infrared image** [7383-158]
R. Ding, C. Shi, Beijing Institute of Technology (China)
- 7383 4G **Experiment of monitoring thermal discharge drained from nuclear plant through airborne infrared remote sensing** [7383-159]
D. Wang, State Oceanic Administration (China), Shanghai Institute of Technical Physics (China), and Graduate School of Chinese Academy of Sciences (China); D. Pan, N. Li, State Oceanic Administration (China)
- 7383 4H **An estimating algorithm for highly maneuvering target tracking** [7383-160]
D. Li, L. Ding, Shanghai Institute of Technical Physics (China)
- 7383 4I **Misalignment correction method of space optical system on orbit** [7383-161]
W. Zhang, L. Lu, F. Long, Q. Hou, Harbin Institute of Technology (China)
- 7383 4J **Design of readout circuit for microcantilever-based ripple uncooled infrared focal plane arrays** [7383-162]
J. Cao, Z. Chen, W. Lu, Y. Zhang, K. Lei, B. Zhao, Peking Univ. (China)
- 7383 4K **Point pattern registration method based on affine invariant** [7383-163]
X. Zhu, Y. Xu, Q. Yu, National Univ. of Defense Technology (China)
- 7383 4L **Real-time implementation of large-size image restoration with edge-preserving** [7383-165]
Y. Zhang, K. Gao, G. Ni, T. Bai, H. Wang, Beijing Institute of Technology (China)
- 7383 4M **The optimizing designing of bi-material micro cantilever with adhesive layer in between and its application in an uncooled MEMS IR FPA** [7383-166]
X. Zhang, Institute of Microelectronics (China) and Communication Univ. of China (China); B. Jiao, D. Chen, T. Ye, Institute of Microelectronics (China)
- 7383 4N **Knowledge-based automatic recognition technology of radome from infrared images** [7383-167]
X. Wang, L. Ma, X. Fang, L. Chen, H. Lu, Beijing Information High-Tech Institute (China)
- 7383 4O **"Hedgehog Point" feature point matching based on points structure information** [7383-168]
Y. Xu, X. Zhu, Q. Yu, National Univ. of Defense Technology (China)

- 7383 4P **Research of infrared stealth criterion of targets based on signal-to-noise ratio** [7383-169]
X. Chen, L. Yang, F. Sun, Naval Univ. of Engineering (China)
- 7383 4Q **Performance evaluation of MCT arrays developed for SWIR and hyperspectral applications: test bench and preliminary results** [7383-170]
L. Duvet, E. Martin, N. Nelms, European Space Agency (Netherlands)
- 7383 4R **Control and acquisition system for SWIR focal plane arrays from SOFRADIR** [7383-171]
T. Beaufort, L. Duvet, European Space Agency (Netherlands)
- 7383 4S **Optical analysis of thermo-optic infrared focal plane array** [7383-172]
X. Yan, Shanghai Institute of Microsystem and Information Technology (China) and Graduate School of Chinese Academy of Sciences (China); F. Feng, Y. L. Wang, Shanghai Institute of Microsystem and Information Technology (China)
- 7383 4T **Study on multispectral imaging detection and recognition** [7383-173]
W. Jun, D. Na, J. Gao, H. Yu, W. Jun, J. Li, Y. Zheng, G. Fei, K. Sun, Xi'an Institute of Applied Optics (China)
- 7383 4U **Infrared liquid crystal light valve based on polymer/liquid crystal** [7383-174]
Y. Luo, J. Gao, F. Gao, Xi'an Institute of Applied Optics (China)
- 7383 4V **The simulation modeling and validation by wind tunnel experimentation for optical transmission effect of high speed turbulence flow** [7383-175]
J. Fei, Beijing Simulation Ctr. (China); L. Zhan, C. Chen, Beijing Electronic System Engineering Institute (China); Y. Gao, Beijing Simulation Ctr. (China)
- 7383 4W **Research on infrared thermal imaging systems for field temperature measurement** [7383-176]
Y. Qin, W. Xi, X. Li, Y. Xie, Q. Xie, Xi'an Institute of Applied Optics (China)
- 7383 4X **The sensitivity of polarized radiative transfer to the aerosol properties and surface** [7383-177]
Y. Xu, China Meteorological Agency (China) and Anhui Institute of Optics and Fine Mechanics (China); F. Zhao, China Meteorological Agency (China); Y. Qiao, Anhui Institute of Optics and Fine Mechanics (China); W. Gao, China Meteorological Agency (China) and Anhui Institute of Optics and Fine Mechanics (China)
- 7383 4Y **Detection for low light leakage based on CCD and image processing technology** [7383-178]
T. Wu, C. Yin, Y. Duan, South China Univ. of Technology (China)
- 7383 4Z **Dumping design of CTIA readout circuit based on a low-dimensional quantum structure photoelectric sensor** [7383-179]
F. M. Guo, G. Z. Zhan, J. Q. Han, B. Xu, X. L. Zhou, J. W. Li, D. Y. Xiong, Y. C. Ye, Y. P. Wang, X. H. Wang, J. H. Chu, East China Normal Univ. (China)
- 7383 50 **The design and solving for initial structure of dual field of view IR system** [7383-180]
X. Wang, M. Jiao, B. Yang, Xi'an Institute of Applied Optics (China)

Conference Committee

Conference Chairs

Jeffery Puschell, Raytheon Space and Airborne Systems (United States)
Hai-mei Gong, Shanghai Institute of Technical Physics, CAS (China)
Yi Cai, Shenzhen Compound Semiconductor Engineering Technology
Research Institute (China)
Jin Lu, Tianjin Jinhang Institute of Technical Physics (China)
Jin-dong Fei, Key Laboratory of Control System Simulation, Beijing
Simulation Center (China)

Program Committee

Allen Larar, NASA Langley Research Center (United States)
Allen Huang, Space Science and Engineering Center, University of
Wisconsin, Madison (United States)
H. C. Liu, National Research Council (Canada)
Feng Zhang, China Haiying Machinery & Electronics Technology
Academy (China)
Yan-li Shi, Kunming Institute of Physics (China)
Wen-quan Ma, Institute of Semiconductors, CAS (China)
Wen-po Ma, Beijing Institute of Space Mechanics and Electricity
(China)
Guang-yong Jin, Changchun University of Science and Technology
(China)
Jie Yang, Shanghai Jiao Tong University (China)
Tian-xu Zhang, Huazhong University of Science and Technology (China)
Xian-jie Li, The 13th Institute of China Electronic Technology Group
Corporation (China)
Hui-tong Liu, Tianjin Jinhang Institute of Technical Physics (China)

Symposium Committee

Symposium Chairs

Liwei Zhou, Beijing Institute of Technology (China)
Guofan Jin, Tsinghua University (China)
Xun Hou, Xi'an Institute of Optics and Precision Mechanics (China)
Jiaxiong Fang, Shanghai Institute of Technical Physics (China)

Organizing Committee

Jinxue Wang, *Chair*, Raytheon Vision Systems (United States)
Yuping Cui, *Chair*, Beijing Institute of Automatic Control Equipment (China)
Zhixin Wu, *Chair*, Tianjin Jinhang Institute of Technical Physics (China)
Jianqiang Zhu, Shanghai Institute of Optics and Fine Mechanics (China)
Wei Zhao, Xi'an Institute of Optics and Precision Mechanics (China)
Xiaopeng Wang, Xi'an Institute of Applied Optics (China)
Haimei Gong, Shanghai Institute of Technical Physics (China)
Quanxin Ding, Electro-Optical Equipment Research Institute, Aviation Industries of China (China)
Zhaojun Liu, Beijing Institute of Space Mechanics and Electricity (China)
Jungang Liu, The 44th Institute of China Electronic Technology Group Corporation (China)
Bo Liu, Beijing Huahang Radio Measurement and Research Institute (China)
Guoxiong Li, Key Laboratory of Control System Simulation, Beijing Simulation Center (China)
Xin Yu, Beijing Institute of Technology (China)
Huillin Jiang, Changchun University of Science and Technology (China)
Guangjun Zhang, Beijing University of Aeronautics and Astronautics (China)
Yu Yao, Harbin Institute of Technology (China)
Tianxu Zhang, Huazhong University of Science and Technology (China)
Suying Yao, Tianjin University (China)
Jun Shen, Tongji University (China)
Yuelin Wang, National Key Laboratory of Microsystem Technology (China)
Wei Wang, Beijing Aerospace Times Optical-electronic Technology Company, Ltd. (China)

Program Committee

Guofan Jin, *Chair*, Tsinghua University (China)
Xuyuan Chen, Vestfold University College (Norway)
Yuelin Wang, Shanghai Institute of Microsystem and Information Technology (China)
Zhiping Zhou, Peking University (China)
Qingkang Wang, Shanghai Jiaotong University (China)
Farzin Amzajerian, NASA Langley Research Center (United States)
Chunqing Gao, Beijing Institute of Technology (China)
Tianyu Xie, Peking University (China)
Jeffery Puschell, Raytheon Space Airborne Systems (United States)
Haimei Gong, Shanghai Institute of Technical Physics (China)
Jin Lu, Tianjin Jinhang Institute of Technical Physics (China)
Yi Cai, Shenzhen Compound Semiconductor Engineering Technology Research Institute (China)
Jindong Fei, Key Laboratory of Control System Simulation, Beijing Simulation Center (China)
Kun Zhang, The 44th Institute of China Electronic Technology Group Corporation (China)
Nick Waltham, Rutherford Appleton Laboratory (United Kingdom)
Guangjun Zhang, Beijing University of Aeronautics and Astronautics (China)
Kecong Ai, Key Laboratory for Low Light Level Technology of COSTIND (China)
Xiangjun Wang, Tianjin University (China)
X.-C. Zhang, Rensselaer Polytechnic Institute (United States)
James M. Ryan, University of New Hampshire (United States)
Cunlin Zhang, Capital Normal University (China)
Chuanxiang Tang, Tsinghua University (China)
Kangnan Qi, Beijing Optical Society (China)
Ying Gu, The General Hospital of the People's Liberation Army (China)
Yongtian Wang, Beijing Institute of Technology (China)

Introduction

We have the great honor of organizing the 3rd International Symposium on Photoelectronic Detection and Imaging (ISPDl) in Beijing, following the 1st and 2nd ISPDl held successfully in Beijing in 1993 and 2007. It is truly a great pleasure for us to greet more than 1,000 participants from many different countries attending ISPDl 2009! I firmly believe that the symposium will become an important international event in the field of photoelectronic detection and imaging technology.

ISPDl 2009 is sponsored by the Photoelectronic Technology Professional Committee and the Chinese Society of Astronautics, and is organized by Tianjin Jinhang Institute of Technical Physics. There are also 25 cooperating organizations that support the meeting. About 700 papers were accepted for presentation and 1,300 abstracts were submitted from more than 10 countries, including the United States, United Kingdom, Germany, France, Norway, Sweden, Denmark, Canada, Japan, Republic of Korea, Russian Federation, China, and so on. We have over 90 internationally renowned scientists and experts who were invited to speak.

The purpose of ISPDl 2009 is to provide a forum for the participants to report and review the ideas, up-to-date comprehensive progress, and developments, and to discuss novel approaches to application areas in the field of photoelectronic detection and imaging. It is sincerely hoped that the research and development in photoelectronic detection and imaging will flourish, and that international cooperation of our common interests will be enhanced.

I would like to heartily thank our sponsors and cooperative organizations for all they have done for the meeting. Thanks also to all the authors for their contributions to these proceedings, to all of the participants and friends for their interest and efforts in helping to make the symposium possible; to the organizing committee and the program committee for their effective work and valuable advice, especially the ISPDl 2009 Secretariat, and to the SPIE staff for their tireless effort and outstanding service in preparing and publishing the conference proceedings.

Again, we extend our warmest greetings to you and hope you have a rewarding and exciting stay during ISPDl 2009!

Liwei Zhou

Cooperating Organizations of ISPD 2009

Shanghai Institute of Optics and Fine Mechanics, CAS (China)
Xi'an Institute of Optics and Precision Mechanics, CAS (China)
Shanghai Institute of Technical Physics, CAS (China)
Xi'an Institute of Applied Optics (China)
Beijing Institute of Automatic Control Equipment (China)
Electro-Optical Equipment Research Institute of AVIC (China)
Beijing Institute of Space Mechanics and Electricity (China)
The 44th Institute of China Electronic Technology Group Corporation (China)
Beijing Huahang Radio Measurement and Research Institute (China)
State Key Laboratory of Transient Optics and Photonics (China)
Key Laboratory for Low Light Level Technology, COSTIND (China)
Key Laboratory of Control System Simulation, Beijing Simulation Center (China)
State Key Laboratory of Transducer Technology (China)
National Key Laboratory of Microsystem Technology (China)
Tsinghua University (China)
Beijing Institute of Technology (China)
Beijing University of Aeronautics and Astronautics (China)
Harbin Institute of Technology (China)
Huazhong University of Science and Technology (China)
Tongji University (China)
Changchun University of Science and Technology (China)
Capital Normal University (China)
The National Training Base for Integrated Circuits, Tianjin University (China)
Simulation Methodology and Modeling Professional Committee, Chinese
Association for System Simulation (China)
Beijing Aerospace Times Optical-Electronic Technology Company, Ltd. (China)

