

# PROCEEDINGS OF SPIE

## ***Holography, Diffractive Optics, and Applications VII***

**Yunlong Sheng  
Chongxiu Yu  
Changhe Zhou**  
*Editors*

**12–14 October 2016  
Beijing, China**

*Sponsored by*  
SPIE  
COS—Chinese Optical Society

*Cooperating Organizations*

Tsinghua University (China) • Peking University (China) • University of Science and Technology of China (China) • Zhejiang University (China) • Tianjin University (China) • Beijing Institute of Technology (China) • Beijing University of Posts and Telecommunications (China) • Nankai University (China) • Changchun University of Science and Technology (China) • University of Shanghai for Science and Technology (China) • Capital Normal University (China) • Huazhong University of Science and Technology (China) • Beijing Jiaotong University (China) • Shanghai Institute of Optics and Fine Mechanics (China) • Changchun Institute of Optics and Fine Mechanics (China) • Institute of Semiconductors (China) • Institute of Optics and Electronics (China) • Institute of Physics (China) • Shanghai Institute of Technical Physics (China) • China Instrument and Control Society (China) • Optoelectronics Technology Committee, COS (China) • SPIE National Committee in China (China) • Optical Society of Japan (Japan) • Optical Society of Korea (Korea, Republic of) • The Australian Optical Society (Australia) • Optics and Photonics Society of Singapore (Singapore) • European Optical Society

*Supporting Organizations*

CAST—China Association for Science and Technology (China)  
NSFC—National Nature Science Foundation (China)

*Published by*  
SPIE

**Volume 10022**

Proceedings of SPIE 0277-786X, V. 10022

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

# Contents

ix	<i>Authors</i>
xiii	<i>Symposium Committees</i>
xv	<i>Conference Committee</i>
xvii	<i>Introduction</i>

---

## SESSION 1 DIGITAL HOLOGRAPHY I

---

10022 02	<b>Common-path digital holographic microscopy and its applications (Invited Paper)</b> [10022-1]
10022 03	<b>Super-resolution imaging in optical scanning holography using structured illumination (Invited Paper)</b> [10022-2]
10022 04	<b>Imaging characteristics of self-interference digital holography with structured illumination</b> [10022-3]
10022 05	<b>Digital in-line holographic microscope based on the grating illumination with improved resolution by interpolation</b> [10022-4]
10022 06	<b>Processing of digital holograms: segmentation and inpainting</b> [10022-10]

---

## SESSION 2 DIGITAL HOLOGRAPHY II

---

10022 07	<b>Noise reduction for compressive digital one-shot in-line holographic tomography (Invited Paper)</b> [10022-6]
10022 08	<b>Three-dimensional edge extraction in optical scanning holography</b> [10022-7]
10022 09	<b>Resampling masks for phase-shifting digital holography</b> [10022-8]
10022 0A	<b>Pixel super-resolution in digital in-line holography</b> [10022-9]
10022 0B	<b>Interference comb-spectroscopy with increasing sensitivity</b> [10022-5]
10022 0C	<b>Measuring a thermal expansion of thermoelectric materials by using in-line digital holography</b> [10022-11]

---

**SESSION 3 3D HOLOGRAPHIC IMAGING AND DISPLAYS I**

---

- 10022 0D **A head-mounted compressive three-dimensional display system with polarization-dependent focus switching (Invited Paper)** [10022-12]
- 10022 0E **Volumetric display with holographic multi-photon excitations (Invited Paper)** [10022-13]
- 10022 0F **Focus-tunable multi-view holographic 3D display using a 4k LCD panel (Invited Paper)** [10022-14]
- 10022 0H **Optimization of lens shape for autostereoscopic display** [10022-16]
- 10022 0I **High-aperture diffractive lens for holographic printer** [10022-17]

---

**SESSION 4 3D HOLOGRAPHIC IMAGING AND DISPLAYS II**

---

- 10022 0J **Development of scanning holographic display using MEMS SLM (Invited Paper)** [10022-18]
- 10022 0K **Optical scanning holography for stereoscopic display (Invited Paper)** [10022-19]
- 10022 0L **Three dimensional identification card and applications (Invited Paper)** [10022-20]
- 10022 0N **Temporal speckle method for measuring three-dimensional surface of large-sized rough glass** [10022-22]

---

**SESSION 5 DIFFRACTION IN NANOSTRUCTURES**

---

- 10022 0P **Hyperbranched-polymer dispersed nanocomposite volume gratings for holography and diffractive optics** [10022-24]
- 10022 0Q **A printable color filter based on the micro-cavity incorporating a nano-grating** [10022-25]
- 10022 0R **A small deployable infrared diffractive membrane imaging system** [10022-26]
- 10022 0S **Design of soft x-ray varied-line-spacing grating based on electron beam lithography-near field lithography** [10022-27]
- 10022 0T **Anti-reflective sub-wavelength structures at a wavelength of 441.6 nm for phase masks of near-field lithography** [10022-28]

---

**SESSION 6 DEVICES AND POLARIZATION HOLOGRAMS**

---

- 10022 0U **Fabrication of grating-Fresnel lens by using PDMS based soft lithography** [10022-29]
- 10022 0V **Electro-optically and all-optically addressed spatial light modulator devices based on organic-inorganic hybrid structures** [10022-30]

10022 0X **Manipulation of full Poincaré beams on a hybrid Poincaré sphere** [10022-32]

---

**SESSION 7 OPTICAL METROLOGY**

---

10022 0Z **Interference pattern period measurement at picometer level (Invited Paper)** [10022-34]

10022 10 **Effect of optical surface flatness performance on spatial-light-modulator-based imaging system** [10022-35]

10022 11 **High-density grating pair for displacement measurement** [10022-36]

10022 12 **Image grating metrology using phase-stepping interferometry in scanning beam interference lithography** [10022-37]

10022 13 **Research on a grating interferometer with high optical subdivision based on quasi-Littrow configuration** [10022-38]

10022 14 **Study of a grating interferometer with high optical subdivision technique** [10022-39]

---

**SESSION 8 APPLICATIONS**

---

10022 15 **Design and analysis of highly efficient reflective 1×3 splitting grating with triangular structure** [10022-40]

10022 16 **Imaging performance tests of diffractive optical system** [10022-41]

10022 17 **Diode laser array by spectral beam combing with a transmission grating** [10022-42]

10022 18 **Facial skin color measurement based on camera colorimetric characterization** [10022-43]

10022 19 **Recent progress in holographic wavefront sensing** [10022-45]

---

**SESSION 9 COMPUTATIONAL HOLOGRAPHY I**

---

10022 1D **Zoomable three-dimensional computer-generated holographic display based on shifted Fresnel diffraction** [10022-49]

10022 1F **Design of computer-generated hologram apertures with the Abbe transform** [10022-51]

10022 1G **Recent progress on fully analytic mesh based computer-generated holography (Invited Paper)** [10022-52]

---

**SESSION 10 COMPUTATIONAL HOLOGRAPHY II**

---

10022 1J **Design and analysis of broadband diffractive optical element for achromatic focusing** [10022-54]

## POSTER SESSION

---

- 10022 1L **Recording holographic memory device based on computer synthesis of Fourier holograms** [10022-44]
- 10022 1M **The influence of diffraction gratings relief distortion on diffraction efficiency during authentication security holograms** [10022-47]
- 10022 1N **Microsphere microscopic imaging with the coherent light** [10022-57]
- 10022 1O **Generation of speckle vortices by Archimedes' spiral micro-holes** [10022-58]
- 10022 1P **Design and numerical simulation of a silicon-based linear polarizer with double-layered metallic nano-gratings** [10022-59]
- 10022 1Q **Asymmetric propagation of electromagnetic waves through nanoscale spirals** [10022-60]
- 10022 1R **High resolution digital holography based on the point source scanning** [10022-61]
- 10022 1S **Experimental study of the method of recording color volume security holograms on different photosensitive materials on the base of the diffuser with a narrow indicatrix of laser radiation** [10022-62]
- 10022 1T **Realization of Fourier and Fresnel computer-generated hologram based on MATLAB** [10022-63]
- 10022 1U **Improve the diffraction efficiency of the multilayer dielectric gratings** [10022-64]
- 10022 1V **Broadband plasmonic metasurface-enabled quarter waveplates with fence-type grating** [10022-65]
- 10022 1W **Virtual viewpoint generation for three-dimensional display based on the compressive light field** [10022-67]
- 10022 1Y **Characteristics of the autostereoscopic three-dimensional LED display based on diffractive optical elements sheet** [10022-69]
- 10022 1Z **Experiments of diffractive optical elements obtained by ion plasma etching for aiming and display devices** [10022-70]
- 10022 20 **Tunable nano-pattern generation and photolithography using hybrid Kretschmann and Otto structures** [10022-71]
- 10022 22 **The measurement of flow rate of micro-fluid on-chip by digital holography** [10022-73]
- 10022 23 **Real-time measurement of liquid concentration by digital holography** [10022-74]
- 10022 24 **Three-dimensional display based on integral imaging using light shaping diffusor** [10022-75]
- 10022 25 **Generation and representation of vector vortex beams based on metasurfaces** [10022-76]

- 10022 26 **Analysis of performance of the direct search with random trajectory method applied to the task of minimization of kinoform synthesis error [10022-77]**
- 10022 27 **Numerical comparison of scalar and vector methods of digital hologram compression [10022-78]**
- 10022 2A **A three-dimensional content remapping method for the auto-stereoscopic display [10022-81]**
- 10022 2B **Phase extracting and unwrapping algorithm of electrical speckle shearing phase-shifting pattern interferometry [10022-84]**
- 10022 2D **Experimental study on degree of coherence for stochastic electromagnetic fields [10022-86]**
- 10022 2E **Bilayer metasurface for directional launching of cross-polarization component [10022-88]**
- 10022 2F **3D polarisation speckle as a demonstration of tensor version of the van Cittert-Zernike theorem for stochastic electromagnetic beams [10022-89]**
- 10022 2H **Autofocusing through cosine and modified cosine score in digital holography [10022-91]**
- 10022 2I **Sensitive temperature measurements based on Lorentzian and Fano resonance lineshapes of a silicon photonic crystal cavity [10022-92]**
- 10022 2J **Application of the microlens array in the projection of the laser scanning [10022-93]**
- 10022 2L **Three-dimensional simulation and auto-stereoscopic 3D display of the battlefield environment based on the particle system algorithm [10022-95]**
- 10022 2M **Vertex shading of the three-dimensional model based on ray-tracing algorithm [10022-96]**
- 10022 2N **Real-time synchronized rendering of multi-view video for 8Kx4K three-dimensional display with spliced four liquid crystal panels [10022-97]**
- 10022 2O **Three-dimensional scene capturing for the virtual reality display [10022-98]**
- 10022 2Q **Interactive dynamic three-dimensional scene for the ground-based three-dimensional display [10022-100]**
- 10022 2R **A-star algorithm based path planning for the glasses-free three-dimensional display system [10022-101]**
- 10022 2S **Electric breakdown of dielectric thin films for high-voltage display applications [10022-102]**
- 10022 2T **Visual discomfort caused by color asymmetry in 3D displays [10022-103]**
- 10022 2U **The implementation of laser speckle reduction based on MEMS two-dimensional scanning mirror [10022-105]**