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David A. Cardimona
Editors

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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

- vii *Conference Committee*
ix *Introduction*

HYBRID AND NANOPARTICLE MATERIALS FOR RADIATION ENVIRONMENTS

- 7095 02 **Electronic devices based upon Germanium nano-crystals with durability to strong neutron irradiation (Invited Paper)** [7095-01]
I. Baron, S. Levy, A. Chelly, Z. Zalevsky, O. Limon, Bar-Ilan Univ. (Israel); S. Dun, T. Lu, Sichuan Univ. (China); I. Shlimak, Bar-Ilan Univ. (Israel)
- 7095 03 **The effects of ionizing radiation, temperature, and space contamination effects on self-cleaning and anti-contamination coatings (Invited Paper)** [7095-02]
R. Pirich, J. Weir, D. Leyble, Northrop Grumman Integrated Systems (United States)

INNOVATIVE PHOTONIC MATERIALS AND COMPONENTS

- 7095 05 **An antireflective coating suitable for use on polymer optics (Invited Paper)** [7095-04]
L. J. Crawford, N. R. Edmonds, P. N. Plimmer, Univ. of Auckland (New Zealand); J. Lowy, Anti-Reflective Technologies, Ltd. (New Zealand)
- 7095 07 **Spectrally selective infrared absorption enhancement in photonic crystal cavities (Invited Paper)** [7095-07]
W. Zhou, Z. Qiang, L. Chen, H. Yang, Univ. of Texas at Arlington (United States); G. J. Brown, Air Force Research Lab. (United States)

RADIATION HARDENING OF PHOTONIC COMPONENTS I

- 7095 0A **Qualification of LEDs for cameras on NASA's Phoenix Mars Lander** [7095-24]
R. O. Reynolds, R. D. Tanner, Univ. of Arizona (United States); S. Albanna, College of Optical Sciences, Univ. of Arizona (United States)
- 7095 0B **Temperature and dose-rate effects in gamma irradiated rare-earth doped fibers** [7095-11]
B. P. Fox, K. Simmons-Potter, Univ. of Arizona (United States); W. J. Thomes, Jr., NASA Goddard Space Flight Ctr. (United States); D. C. Meister, R. P. Bambha, D. A. V. Kliner, Sandia National Labs. (United States)

RADIATION HARDENING OF PHOTONIC COMPONENTS II

- 7095 0D **MISSE 6: testing materials in space** [7095-13]
N. S. Prasad, W. H. Kinnard, NASA Langley Research Ctr. (United States)
- 7095 0E **The impact of radiation hardened by design (RHBD) techniques on the performance of readout integrated circuits in radiation environments** [7095-14]
J. E. Hubbs, M. E. Gramer, D. Maestas-Jepson, G. A. Dole, A. Hahn, Air Force Research Lab. (United States)
- 7095 0F **Low-noise InGaAs balanced p-i-n photoreceiver for space based remote sensing applications at 2 micron wavelength** [7095-15]
A. Joshi, D. Becker, S. Datta, Discovery Semiconductors, Inc. (United States)
- 7095 0G **Recent progress in development and nonlinear optical device application of optical fibers incorporated with noble metal nanoparticles (Invited Paper)** [7095-16]
A. Lin, Gwangju Institute of Science and Technology (Republic of Korea) and Xi'an Institute of Optics and Precision Mechanics (China); W.-T. Han, Gwangju Institute of Science and Technology (Republic of Korea)

NOVEL PHOTONIC DEVICES FOR SPACE-BASED APPLICATIONS I

- 7095 0I **Surface-acoustic-wave based quantum-well photodetectors** [7095-18]
D. H. Huang, Air Force Research Lab. (United States); G. Gumbs, Hunter College of the City Univ. of New York (United States); M. Pepper, Cavendish Lab., Univ. of Cambridge (United States)
- 7095 0J **Fabrication, characterization of II-VI semiconductor nanowires and applications in infrared focal plane arrays** [7095-19]
M. M. Crouse, T. L. James, Phoebus Optoelectronics LLC (United States); D. Crouse, The City College of New York (United States)

NOVEL PHOTONIC DEVICES FOR SPACE-BASED APPLICATIONS II

- 7095 0K **High performance of IR detectors due to controllable kinetics in quantum-dot structures** [7095-20]
V. Mitin, A. Sergeev, L.-H. Chien, N. Vagidov, Univ. at Buffalo (United States)
- 7095 0L **Voltage tunable hyper-spectral quantum dot infrared photodetector (QDIP)** [7095-21]
X. Lu, J. Vaillancourt, Univ. of Massachusetts, Lowell (United States)
- 7095 0O **Integrated multi-channel nano-engineered optical hydrogen and temperature sensor detection systems for launch vehicles** [7095-25]
M. Z. Alam, J. Moreno, J. S. Aitchison, M. Mojahedi, Univ. of Toronto (Canada);
A. A. Kazemi, The Boeing Co. (United States)

POSTER SESSION

- 7095 OP **Development, qualification, and integration of the optical fiber array assemblies for the Lunar Reconnaissance Orbiter** [7095-28]
M. N. Ott, NASA Goddard Space Flight Ctr. (United States); R. Switzer, R. Chuska,
F. LaRocca, W. J. Thomes, S. Macmurphy, MEI Technologies (United States)

Author Index

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- 1 Hybrid and Nanoparticle Materials for Radiation Environments

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- 2 Innovative Photonic Materials and Components

Dustin Rider, Air Force Research Laboratory (United States)

- 3 Radiation Hardening of Photonic Components I

Kelly Simmons Potter, The University of Arizona (United States)

- 4 Radiation Hardening of Photonic Components II

Dustin Rider, Air Force Research Laboratory (United States)

- 5 Keynote Address

David A. Cardimona, Air Force Research Laboratory (United States)

- 6 Novel Photonic Devices for Space-Based Applications I
Allan Hahn, Air Force Research Laboratory (United States)
- 7 Novel Photonic Devices for Space-Based Applications II
David A. Cardimona, Air Force Research Laboratory (United States)

Introduction

The second SPIE Nanophotonics and Macrophotonics for Space Environments (NMSE II) proved to be a well-attended conference since, in part, it was an outgrowth from the previous SPIE Photonics for Space Environments I–XI conferences. The synergism of nanotechnology and photonics for addressing and advancing space applications was clearly evident and has proven to be an excellent choice for this conference, providing a unique and useful forum.

A large number of invited papers were presented as well as two excellent keynote presentations by Dr. Charles Lee of the Air Force Office of Scientific Research and Dr. Thomas Caudill of the Air Force Research Laboratory, Space Vehicles Directorate. Dr. Lee's talk dealt with his portfolio of organic materials research, and Dr. Caudill described the monumental problems inherent in the requirements of Space Situational Awareness (being aware of everything in space, all the time). As in the first NMSE conference, this year there were quite a few papers on the effects of ionizing radiation on photonic materials and devices (including quantum-dot-based solar cells, self-cleaning optical coatings, germanium-nanocrystal-based electronic devices, radiation-hardened-by-design readout integrated circuits, rare-earth-doped optical fibers, LEDs, and various laser and optical elements). The other large group of papers this year described novel photonic devices that could be used in space to improve the performance of sensor systems (including low-noise InGaAs p-i-n photoreceivers, surface-acoustic-wave quantum well photodetectors, nanowire-based IR focal plane arrays, quantum dot IR detectors, and enhanced IR absorption in photonic crystals). We also had a couple of very interesting papers on optical fibers: one describing the incorporation of noble metal nanoparticles, and one describing the qualification and integration of a fiber array for the Lunar Reconnaissance Orbiter. Unlike last year, this year there were only a couple of papers on polymer photonic devices: an antireflective coating for polymer optics, and a hybrid electro-optic polymer/sol-gel modulator.

We look forward to the next convening of the SPIE NMSE conference and expect that additional and advanced nano-, micro- and macrophtonic areas of research and development will be presented and continue to expand and improve the conference objectives.

The chairs wish to thank the SPIE NMSE II program committee, speakers, session chairs, and especially the SPIE staff for their many contributions to making the NMSE II conference a success.

Edward W. Taylor
David A. Cardimona

