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Material Technologies and Applications to Optics, Structures, Components, and Sub-Systems

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Introduction

These proceedings document the 2013 conference on Material Technologies and Applications to Optics, Structures, Components, and Sub-Systems. The conference took place from 26 August to 28 August 2013, as part of the broader Optics + Photonics Meeting in San Diego, California, USA. This was the inaugural conference in this area, expanding upon the scope of the previous conference on Optical Materials and Structures Technologies. The conference began with a Joint Session with the UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts conference, we thank those Conference Chairs, Dr. Howard A. MacEwen (Reviresco LLC) and Dr. James B. Breckinridge (Univ. of Arizona and Cal Tech), for collaborating with us and coordinating a well-attended and interesting opening session which covered a wide range of topics including low expansion glasses, SiC, and refractive materials, with an excellent capstone presentation from Dr. H. Philip Stahl, describing mirror technology development activities being led by the NASA Marshall Space Flight Center.

The next two days covered seven additional Sessions. The Metal Materials Session was chaired by Mr. Robert Michel (Materion) and provided updates on aluminum, beryllium-aluminum composites, and single crystal silicon material technologies. A Test and Analysis Session focused on a novel ULE mirror technology from ITT Exelis, and included results from radiation testing of Carbon fiber mirrors which were exposed to low earth orbit radiation on the International Space Station. Mr. Chris Wainer (L-3 Communications) worked as Session Chair for one of two Sessions on Ceramic Materials. These two Sessions covered a broad range of topics including a novel HoneySiC opto-mechanical material, mature reaction bonded SiC and Cesic® materials, applications of ceramics to high profile space programs (AKARI and JMAPS), and polishing and assembly of SiC systems. Mr. Lynn Allen (ITT) chaired a session on Composite Materials which described mature composite structures from ATK and maturing composite mirror technologies being explored by JAXA. The final session was on Glasses and Windows, Mr. John Pepi (L-3 Communications) chaired this session providing updates on novel window materials being developed at NRL, a newly developed bonding approach for low-expansion glasses, and the emerging area of negative index of dispersion materials.

One of the highlights of the conference was a panel discussion on the topic of "Space Qualification of Materials". We were extremely pleased to have experts from around the world provide their different insights during this panel discussion, and the talks which preceded the panel discussion. Mr. Graham Coe (European Space Agency - Research and Technology Center), Dr. Vince M. Cowan (Air Force Research Laboratory), Prof. Takao Nakagawa (Japan Aerospace Exploration Agency), Mr. John W. Pepi (L-3 Communications IOS-Wilmington), and Dr. David B. Witkin (The Aerospace Corporation) engaged the attendees with an

active discussion on this controversial topic. We want to thank the panel participants for allowing us to create this unique opportunity for the community. At its core, this is what the entire Optics + Photonics Meeting is looking to do, create opportunities for an open dialogue on topical subjects, and create a venue where the world's leading subject matter experts can be available for both formal presentations and informal hallway discussions. Thank you to all of the SPIE staff, our Program Committee, contributing authors, and conference attendees. We hope all participants came away from the meeting feeling re-energized about their areas of research and development and re-engaged with their broad community of collaborators, competitors, and customers.

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