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Photonic Applications for Aerospace, Commercial, and Harsh Environments IV

**Alex A. Kazemi
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Editors

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Introduction

Over the past 50 years, the field of fiber optic development has gone through a quantum leap. We have been greatly impressed over the past few years by the tremendous progress of photonics in the aviation, aerospace, and transportation industry for the harsh environment. More information, intelligence, and data are transferred from one point to another more quickly and precisely than ever thought possible thanks to the miracle of optical fibers. Fiber optics shall become as common as wire, are easy to construct to precise tolerances and are accurate and perfect in operation.

The optics and photonics greatly benefitted from the low-cost telecommunications industries, and due to this synergy, an enormous amount of new technologies have been introduced in the form of micro-packaging of optics components, aircraft photonics networks, micro and nano-sensors, see-through, wearable head-mounted displays, high power LEDs, and phase-shifted fiber Bragg gratings for materials health monitoring, to name a few.

We are fortunate to be among pioneers and the thrill of technical achievement can be just as tangible to those of us involved with engineering, innovation, and science as the thrill of lifetime accomplishment. This book contains a series of papers which contain state-of-the-art optics and fiber optic sensor technologies for photonics in aerospace and transportation industries such as advanced technologies for cryogenic leak detection of hydrogen and oxygen for space applications, a new generation of smart fiber optic sensors, a novel implementation of wearable glass, a high speed laser communication network for satellite systems, micro and nano in optoelectronics and wireless sensor monitoring systems.

In the future, photonics will internally integrate most of the functions in aerospace and transportation industry applications. Today, a great proportion of the world's communications are carried by fiber optic cables. Fiber optic technology has revolutionized the telecommunication market and is rapidly becoming a major player in information technology and aviation industries.

This year, we had the highest number of entries with a total of 45 papers which include 8 papers in the field of optoelectronics. As a result, I am very grateful to all of the authors, and on behalf of the SPIE and myself, would like to take this opportunity to thank the distinguished authors from around the world for their valuable contributions, particularly Dr. Bernard Kress from Google, Inc. (United States), Professor Simon Thibault from Université Laval (Canada), Professor Nicolas Javahiraly from Université de Strasbourg (France), Professor Syed Murshid from Florida Institute of Technology (United States), Professor Fumio Futami from Tamagawa University (Japan), Professor Philipp Kornreich from Syracuse University

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Alex A. Kazemi