PROCEEDINGS OF SPIE

Tribute to William Wolfe

Mary G. Turner
Editor

15 August 2012
San Diego, California, United States

Sponsored and Published by
SPIE

Volume 8483

Proceedings of SPIE 0277-786X, V.8483

Tribute to William Wolfe, edited by Mary G. Turner, Proc. of SPIE Vol. 8483
848301 · © 2012 SPIE · CCC code: 0277-786/12/$18 · doi: 10.1117/12.2011031

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 *Tribute to William Wolfe*, edited by Mary G. Turner, Proceedings of SPIE Vol. 8483 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN: 0277-786X
ISBN: 9780819492005

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

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIE Digital Library
SPIEDigitalLibrary.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 as 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

Conference Committee

Conference Chair

Mary G. Turner, Breault Research Organization, Inc. (United States)

Session Chairs

1 Session 1
Mary G. Turner, Breault Research Organization, Inc. (United States)

2 Session 2
Mary G. Turner, Breault Research Organization, Inc. (United States)

3 Session 3
Mary G. Turner, Breault Research Organization, Inc. (United States)

Introduction

This conference in tribute to Professor William Wolfe is the result of an initiative started by Prof. Eustace Dereniak, then President-Elect, now President of the SPIE. I was asked if I would be able to help put together this conference. Eustace and I both belong(ed) to the "Wolfe Pack". We were graduate students under Prof. Wolfe, one of us early in his tenure at the Optical Sciences Center (OSC) at the University of Arizona, and one at the end. (I have often joked that after he was willing to release me on the world, he realized it was time to quit.) I was very honored and humbled at the request.

With this conference, Professor Wolfe is added to a very small list of optics luminaries that have been selected by SPIE for similar tribute. It is important to understand the full scope of his contributions to not only the world of optics and engineering, but to his impact on our lives as a whole. Although much of this conference will discuss work related to Bill's students and colleagues at OSC, to limit the discussion of his contributions to this would be to ignore so many of his other contributions. In addition to his 30+ years at OSC, Prof. Wolfe spent much time in industry as a research engineer. Even during his time in industry, he was serving as an educator. His knowledge of radiometry and, more importantly, his ability to explain the fundamentals in a clear manner has helped with the success of many engineers, even those not directly his students. He is known as "Mr. Infrared" for his work on several handbooks which have always been ready at hand for many engineers. He also authored and edited many other books and papers which have brought a systems approach to electro-optical design and analysis. His books often serve as the introduction to new areas of study to engineers expanding their scope of reference. As someone who authored a chapter for one of his reference texts, it was clear that his goal was always to present the information in a manner that was readily accessible to an engineer, but not necessarily to one familiar with all aspects of optics. No jargon was allowed, simply a concise description of the necessary concepts, presented in a manner that was easily understood. I learned a lot from the experience (and every rewrite) and this serves as only one more lesson that I have taken from my association with him.

During his time at OSC he served as thesis advisor for more than 30 students and mentored many more through some aspects of their graduate work. He taught us how to insure the success of any project: we simply had to recall his mantra of "think of everything". Although at first glance, this concept might seem either obvious or maybe impossible, and certainly not reasonable when looking at an unknown problem for the first time, it is an amazingly useful concept. Although we may not initially know everything, we can learn to take the information we know to synthesize or extrapolate, and appropriate more necessary information. Understanding this concept was an important step in making the jump from

being a student to being an engineer. As a result, simply indicating you had studied under Prof. Wolfe was often sufficient for a recent graduate to get a foot in the door in research or industry. He also was instrumental in introducing his students to SPIE, which he served in many capacities, including as President. He allowed us to understand the importance of networking within the technical arena before we really understood the concept.

Professor Wolfe's contributions are not just the sum of parts: his writing, his research, which for many of his students was in areas related to radiometry and surface scatter, his teaching, and most importantly, his mentorship. He also provided an environment that allowed each of his students to thrive in their own fashion, applying the proper amount of stress, threat, humor, etc., to help steer each student to reach their own unique goals. He taught us how to be engineers, and how to communicate with our peers and with the outside world. Today he is still bringing his knowledge to students of all ages, from working with elementary school students to understand the beauty and fun of science, to senior citizens who want to continue learning about the world around them. It is also important to note how many of his students have also become teachers. I will freely admit to borrowing heavily from his teaching methods.

Although it is not possible in this written volume to fully capture the atmosphere of the conference, two separate events that occurred following the session are telling. I was approached by two different groups of two and three students who were attending the SPIE Optics and Photonics Conference to present papers or to work. Both groups indicated that they had been drawn in to listen to some of the presentations at the Wolfe conference because they had heard the laughter while walking outside the conference room and were somewhat curious. They made statements indicating that they were amazed that students could have such a relationship with their graduate advisors, and they hoped they would be able to experience something like that during their careers. I could only wish them the best.

I would like to also thank the others that helped with this conference. James Harvey, Larry Brooks, and Jasmine Cote all helped in trying to locate former students that have gone throughout the world. Kristen Waller at the College of Optical Sciences helped spread the word through the University of Arizona community, and all of the help from SPIE for this event.

Professor Wolfe's role as mentor to so many has provided us with the opportunity to understand that almost no task is impossible. How difficult could it possibly be to find a needle in a haystack after you have located an ice cube floating in space.

Mary G. Turner