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Front Matter: Volume 8488

, "Front Matter: Volume 8488," Proc. SPIE 8488, Zoom Lenses IV, 848801 (19 October 2012); doi: 10.1117/12.2014167

Event: SPIE Optical Engineering + Applications, 2012, San Diego, California, United States

PROCEEDINGS OF SPIE

Zoom Lenses IV

Ellis I. Betensky
Takanori Yamanashi
Editors

12–13 August 2012
San Diego, California, United States

Sponsored and Published by
SPIE

Volume 8488

Proceedings of SPIE 0277-786X, V.8488

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

Zoom Lenses IV, edited by Ellis I. Betensky, Takanori Yamanashi,
Proc. of SPIE Vol. 8488, 848801 · © 2012 SPIE
CCC code: 0277-786/12/\$18 · doi: 10.1117/12.2014167

Proc. of SPIE Vol. 8488 848801-1

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 *Zoom Lenses IV*, edited by Ellis I. Betensky, Takanori Yamanashi, Proceedings of SPIE Vol. 8488 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN: 0277-786X

ISBN: 9780819492050

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

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Introduction

This volume contains the proceedings of Zoom Lenses IV, the fourth SPIE conference on zoom lenses.

Zoom lenses have grown steadily in importance over the past fifty years. The particular nature of zoom lenses was recognized in 1995 by SPIE, when the first conference was held. The present conference continues that recognition by noting the change in technologies; most notably those associated with digital imaging; and the change in applications, particularly those resulting from the reduction in sensor size and the manufacturing cost reduction it has enabled. Also included are papers describing designs utilizing micro-machining and liquid lenses.

In addition to papers describing recent design achievements, these proceedings include papers reviewing various technologies. Additionally these proceedings include a tutorial to help those new to the field understand zoom lens terminology and useful design techniques.

During these past several years optical design software has improved incrementally, which when executed on significantly faster computers, has made the task of zoom lens design optimization less arduous. Even so, several of the authors point out the importance of understanding paraxial optics theory of zoom lenses, and how that understanding can be used to help select the appropriate zoom lens type.

In these proceedings there are 16 papers were presented by authors from eight different countries. The papers are organized according to the six different sessions: Modeling and Optimization; Zoom Lens Design Basics 2012; Applications I: Biomedical; Applications II: Miniature Optics; Applications III: Photography; and Product Design and Evaluation.

The final paper of the conference, The 2012 Zoom Lens Design Problem, describes a zoom lens problem for which several designers submitted solutions. This was the first such zoom lens problem and was well received and of interest to all. We think the zoom lens problem is a welcome addition to the conference, and will be anticipated in future conferences.

We wish to thank SPIE and its staff for supporting this conference.

Ellis I. Betensky
Takanori Yamanashi