

PROCEEDINGS OF SPIE

Zoom Lenses IV

Ellis I. Betensky
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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

SPIE.org

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Printed in the United States of America.

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Contents

v	<i>Conference Committee</i>
vii	<i>Introduction</i>

SESSION 1 MODELING AND OPTIMIZATION

- 8488 02 **Toward the global optimum in zoom lens design (Invited Paper)** [8488-1]
A. Dodoc, Carl Zeiss AG (Germany)
- 8488 03 **Method of zoom lenses aberrations analysis** [8488-2]
I. Livshits, K. Ezhova, V. Zverev, N. V. Luen, National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation)
- 8488 04 **Catadioptric varifocal objective** [8488-3]
E. Ermolaeva, I. Livshits, V. Vasiliyev, National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation)

SESSION 2 ZOOM LENS DESIGN BASICS 2012

- 8488 05 **Developments and trends in IR zoom lenses from 2000 to 2010 (Invited Paper)** [8488-4]
A. Mann, AM Associates (United States)
- 8488 06 **Fundamental considerations for zoom lens design (Invited Paper)** [8488-5]
R. N. Youngworth, Riyo LLC (United States); E. I. Betensky, Consultant (Canada)
- 8488 07 **The AWMC metric for zoom lens assessment** [8488-6]
R. N. Youngworth, Riyo LLC (United States); E. I. Betensky, Consultant (Canada);
W. T. Plummer, WTP Optics (United States)

SESSION 3 APPLICATIONS I: BIOMEDICAL

- 8488 08 **Afocal zoom lenses and their applications (Invited Paper)** [8488-7]
A. Hoegele, Carl Zeiss Meditec AG (Germany); J. Winterot, Carl Zeiss AG (Germany)
- 8488 09 **Four zoom lens design for 3D laparoscope by using liquid lens** [8488-8]
S. Lee, M. Choi, E. Lee, K.-D. Jung, J. Chang, W. Kim, Samsung Advanced Institute of Technology (Korea, Republic of)

8488 0B **Design and assembly of a telecentric zoom lens for the Cygnus x-ray source** [8488-10]
R. M. Malone, S. A. Baker, K. K. Brown, A. H. Curtis, D. L. Esquibel, D. K. Frayer, B. C. Frogget,
National Security Technologies, LLC (United States); M. R. Furlanetto, Los Alamos National
Lab. (United States); J. R. Garten, National Security Technologies, LLC (United States);
T. J. Haines, Los Alamos National Lab. (United States); R. A. Howe, J. A. Huerta,
M. I. Kaufman, National Security Technologies, LLC (United States); N. S. P. King, Los Alamos
National Lab. (United States); S. S. Lutz, K. D. McGillivray, A. S. Smith, National Security
Technologies, LLC (United States)

SESSION 4 APPLICATIONS II: MINIATURE OPTICS

8488 0C **Development of compact optical zoom lenses with extended-depth-of-field (Invited Paper)** [8488-11]
M. Demenikov, Kaleido Technology (Denmark)

8488 0D **Optical zoom lens module using MEMS deformable mirrors for portable device** [8488-12]
J.-S. Lu, G.-D. J. Su, National Taiwan Univ. (Taiwan)

8488 0E **Thin zoom camera module by large-stroke micromachined deformable mirrors** [8488-13]
Y.-H. Huang, Y.-H. Lin, G.-D. J. Su, National Taiwan Univ. (Taiwan)

SESSION 5 APPLICATIONS III: PHOTOGRAPHY

8488 0G **Trend of digital camera and interchangeable zoom lenses with high ratio based on patent application over the past 10 years (Invited Paper)** [8488-15]
T. Sensui, Nikon Corp. (Japan)

8488 0H **Recent advances in digital camera optics (Invited Paper)** [8488-16]
K. Ishiguro, AVC Networks Co., Panasonic Corp. (Japan)

8488 0I **Solutions on a high-speed wide-angle zoom lens with aspheric surfaces** [8488-17]
T. Yamanashi, Panavision Inc. (United States)

SESSION 6 PRODUCT DESIGN AND EVALUATION

8488 0L **High-performance zoom lenses with a forward-located stop (Invited Paper)** [8488-20]
I. A. Neil, ScotOptix (Switzerland)

8488 0M **The 2012 zoom lens design problem: zooming monochromatic quartet** [8488-21]
R. Bates, FiveFocal LLC (United States)

Author Index

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Akira Yabe, Consultant (Germany)

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Session Chairs

- 1 Modeling and Optimization
Wilhelm Ulrich, Carl Zeiss AG (Germany)
- 2 Zoom Lens Design Basics 2012
Takanori Yamanashi, Panavision International LLC (United States)
- 3 Applications I: Biomedical
Richard N. Youngworth, Riyo LLC (United States)
- 4 Applications II: Miniature Optics
Akira Fukushima, Konica Minolta Technology Center (Japan)
- 5 Applications III: Photography
Ellis I. Betensky, Consultant (Canada)
- 6 Product Design and Evaluation
Robert M. Bates, FiveFocal LLC (United States)
Akira Yabe, Consultant (Germany)

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

