PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 8206

, "Front Matter: Volume 8206," Proc. SPIE 8206, Pacific Rim Laser Damage 2011: Optical Materials for High Power Lasers, 820601 (25 January 2012); doi: 10.1117/12.922918

SPIE.

Event: Pacific Rim Laser Damage Symposium: Optical Materials for High Power Lasers, 2011, Shanghai, China

PROCEEDINGS OF SPIE

Pacific Rim Laser Damage 2011

Optical Materials for High Power Lasers

Jianda Shao
Koji Sugioka
Christopher J. Stolz
Editors

6–9 November 2011
Shanghai, China

Cosponsored by
SPIE
SIOM—Shanghai Institute of Optics & Fine Mechanics

Cooperating Organizations
Chinese Optical Society
Chinese Academy of Sciences

Published by
SPIE

Volume 8206

Proceedings of SPIE, 0277-786X, v. 8206

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

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 *Pacific Rim Laser Damage 2011: Optical Materials for High Power Lasers*, edited by Jianda Shao, Proceedings of SPIE Vol. 8206 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN 0277-786X

ISBN 9780819488480

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

Copyright © 2012, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/12/\$18.00.

Printed in the United States of America.

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

SPIE
Digital Library

SPIDigitalLibrary.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

ix	Conference Committee
xi	Introduction

PLENARY SESSION

8206 04	3D microstructuring inside glass by ultrafast laser (Plenary Paper) [8206-02] K. Sugiooka, Y. Hanada, K. Midorikawa, H. Kawano, I. S. Ishikawa, A. Miyawaki, RIKEN (Japan)
8206 05	Progress on the optical materials and components for the high power laser system in China (Plenary Paper) [8206-03] J. Shao, Shanghai Institute of Optics and Fine Mechanics (China); Y. Dai, Shanghai Institute of Laser Plasma (China); Q. Xu, Chengdu Fine Optical Engineering Research Ctr. (China)

ULTRAFAST THROUGH CW LASER IRRADIATION EFFECTS

8206 07	Laser-induced fluorescence of fused silica irradiated by ArF excimer laser (Invited Paper) [8206-05] Q. Lou, H. Zhang, Z. Yuan, J. Zhou, Shanghai Institute of Optics and Fine Mechanics (China)
8206 09	Surface and interface study of SiO_{2-x} coated InP/InGaAs/InGaAsP semiconductor laser microstructures processed in the soft KrF laser irradiation regime [8206-07] N. Liu, S. Blais, J. J. Dubowski, Univ. de Sherbrooke (Canada)

HIGH LASER DAMAGE RESISTANT COATINGS I

8206 0D	Subpicosecond laser breakdown in optical thin films (Invited Paper) [8206-11] W. Rudolph, L. A. Emmert, D. Nguyen, C. Karras, Z. Sun, R. Weber, The Univ. of New Mexico (United States)
8206 0E	The laser induced damage of multilayer optical films [8206-12] Q. Xu, W. Zhang, Y. Liu, Xidian Univ. (China)
8206 0F	Heat conductivity of particle stacking structured SiO₂ porous film [8206-13] Z. Xia, State Key Lab. of Transient Optics and Photonics (China) and Wuhan Univ. of Technology (China); Y. Wu, Wuhan Univ. of Technology (China)
8206 0G	Investigation of laser-induced damage threshold of hafnia/silica high reflectors at 1064 nm [8206-14] W. Ai, Institute of Optics and Electronics (China) and Graduate School of the Chinese Academy of Sciences (China); S. Xiong, Institute of Optics and Electronics (China)

- 8206 0I **Coupling effect of multi-wavelength lasers in damage performance of multilayer mirrors at 355 nm and 1064 nm** [8206-17]
L. Yan, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Science (China); C. Wei, D. Li, G. Hu, Z. Fan, Shanghai Institute of Optics and Fine Mechanics (China)

HIGH LASER DAMAGE RESISTANT COATINGS II

- 8206 0M **Properties of niobium oxide films deposited by pulsed DC reactive magnetron sputtering** [8206-20]
Y. Shao, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); K. Yi, M. Fang, Shanghai Institute of Optics and Fine Mechanics (China); J. Zhang, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China)
- 8206 0O **Effect of the deposition processes on the micro-defects and laser-induced damage threshold of thin films** [8206-22]
D. Zhang, P. Fan, G. Liang, T. Zhang, X. Cai, R. Huang, Shenzhen Univ. (China)
- 8206 0P **Laser-induced damage of multilayer dielectric for broadband pulse compression grating** [8206-23]
F. Kong, S. Chen, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); S. Liu, Y. Jin, Shanghai Institute of Optics and Fine Mechanics (China); H. Guan, Y. Du, C. Wei, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); H. He, K. Yi, Shanghai Institute of Optics and Fine Mechanics (China)
- 8206 0Q **Laser-induced damage properties of antireflective porous glasses** [8206-24]
Y. Du, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); H. He, Y. Jin, M. Zhu, Shanghai Institute of Optics and Fine Mechanics (China); F. Kong, H. Guan, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China)

HIGH-POWER LASER DAMAGE: UV THROUGH IR I

- 8206 0T **Comparative investigation of damage performance on K9 and SiO₂ under 1064-nm nanosecond laser irradiation** [8206-27]
H. Liu, F. Wang, Z. Zhang, J. Huang, X. Zhou, X. Jiang, W. Wu, W. Zheng, China Academy of Engineering Physics (China)
- 8206 0V **Research for ultra-short pulse ablation of dielectric film mirror** [8206-29]
Z. Xiong, P. Zhang, Y. Jiang, X. Wang, D. Huang, W. Fan, X. Li, Shanghai Institute of Optics and Fine Mechanics (China)

- 8206 0W **Incubation effect of laser-induced surface damage of HfO₂/SiO₂ HR coating in the femto-nanosecond region** [8206-30]
S. Chen, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); Y. Zhao, Shanghai Institute of Optics and Fine Mechanics (China); F. Kong, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); D. Li, H. He, J. Shao, Shanghai Institute of Optics and Fine Mechanics (China)

DEFECTS, CONTAMINATION, POLISHING, AND SURFACE DAMAGE

- 8206 13 **Mechanical polishing to improve uniformity of beam sampling grating and its effects on laser-induced damage** [8206-37]
H. Rao, Z. Liu, Y. Liu, S. Fu, Univ. of Science and Technology of China (China)
- 8206 14 **Multiple-defect coupling effect of nanosecond-pulsed laser-induced damage in fused silica** [8206-38]
Z. Yu, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); H. Qi, Y. Zhao, H. He, Shanghai Institute of Optics and Fine Mechanics (China)
- 8206 15 **Analysis of subsurface damage during fabrication process and its removal** [8206-39]
K. Xiao, L. Bao, W. Wang, J. Zhu, Shanghai Institute of Optics and Fine Mechanics (China)
- 8206 16 **Laser plasma effects on surface damage characteristics of silicon** [8206-40]
J. Han, Sichuan Univ. (China); W. Fan, Sichuan Univ. (China) and Optimal Coatech Corp. Ltd. (China); Y. Li, L. Yang, Fine Optical Engineering Research Ctr. (China); G. Feng, X. Gao, Y. Liu, L. Bao, Y. Huang, Sichuan Univ. (China)
- 8206 19 **Study of dust-pollution-induced laser damage on fused silica surface** [8206-43]
X. Zhou, J. Huang, F. Wang, H. Liu, X. Jiang, China Academy of Engineering Physics (China)
- 8206 1C **Reduction of the 355-nm laser-induced damage initiators by removing the subsurface cracks in fused silica** [8206-46]
M. Yang, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); H. Qi, Y. Zhao, K. Yi, Shanghai Institute of Optics and Fine Mechanics (China)

LASER ABLATION AND LASER MACHINING

- 8206 1D **Silica ablation process induced by focused laser plasma soft x-rays (Invited Paper)** [8206-47]
T. Makimura, S. Torii, Univ. of Tsukuba (Japan); H. Niino, National Institute of Advanced Industrial Science and Technology (Japan); K. Murakami, Univ. of Tsukuba (Japan)
- 8206 1E **Progress in advanced laser processing for manufacturing of high efficiency silicon solar cells** [8206-48]
J. Chen, L. Chen, Z. Wu, RX Technologies Co., Ltd. (China); J. Yang, Y. Ma, Beijing GK Laser Technology Co., Ltd (China)

- 8206 1H **Efficient surface processing by ultrafast XUV/NIR dual action** [8206-51]
T. Mocek, K. Jakubczak, J. Chalupsky, Institute of Physics of the ASCR, v.v.i. (Czech Republic); S. B. Park, G. H. Lee, T. K. Kim, C. H. Nam, KAIST (Korea, Republic of); V. Hajkova, M. Toufarova, L. Gemini, D. Margarone, L. Juha, B. Rus, Institute of Physics of the ASCR, v.v.i. (Czech Republic)

CHARACTERIZATION TECHNIQUES AND MEASUREMENT PROTOCOLS

- 8206 1I **Direct and absolute absorption measurements in optical materials and coatings by laser-induced deflection (LID) technique (Invited Paper)** [8206-52]
C. Mühlig, Institut für Photonische Technologien e.V. (Germany)
- 8206 1J **Relevance of the choice of diagnostic methods to investigate laser damage resistance in optical material (Invited Paper)** [8206-53]
J.-Y. Natoli, F. Wagner, L. Gallais, M. Commandré, Institut Fresnel, CNRS, Aix-Marseille Univ., Ecole Centrale Marseille (France)
- 8206 1L **Image denoising based on wavelet transform algorithm** [8206-55]
Y. Ha, X. Wang, M. Wang, Q. Su, Y. Shi, Hebei Univ. (China)
- 8206 1M **Measurement of losses in optical components using filtered optical feedback cavity ring down technique** [8206-56]
Z. Qu, Institute of Optics and Electronics (China) and Graduate School of the Chinese Academy of Sciences (China); B. Li, Y. Han, Institute of Optics and Electronics (China)
- 8206 1N **Investigation of optical surface damage detection with laser-induced fluorescence microscopy** [8206-57]
Z. Gao, X. Tang, China Institute of Atomic Energy (China)
- 8206 1O **Extrapolation of small area test of laser induced damage to large area test** [8206-58]
W. Wang, D. Liu, J. Miao, J. Zhang, P. Sun, Y. Zhang, K. Xiao, J. Zhu, Shanghai Institute of Optics and Fine Mechanics (China)

LASER CERAMICS I

- 8206 1T **Micro-domain controlled anisotropic laser ceramics assisted by rare-earth trivalent (Invited Paper)** [8206-62]
Y. Sato, J. Akiyama, T. Taira, Institute for Molecular Science (Japan)
- 8206 1U **Investigation on the visible emission properties of Tm: Y₂O₃ transparent ceramic** [8206-63]
Q. Yi, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); S. Zhou, Shanghai Institute of Optics and Fine Mechanics (China); T. Tsuboi, Kyoto Sangyo Univ. (Japan); H. Lin, H. Teng, Shanghai Institute of Optics and Fine Mechanics (China)
- 8206 1W **Study on the relation between optical scattering and porosity in transparent Nd/Yb:YAG ceramics** [8206-65]
G. Jin, Shanghai Normal Univ. (China); B. Jiang, Y. Zeng, J. Li, W. Liu, Shanghai Institute of Ceramics (China); J. Liu, Jiangsu Univ. (China); Y. Pan, Shanghai Institute of Ceramics (China); D. Sun, Shanghai Normal Univ. (China)

LASER CERAMICS II

- 8206 1Z **Composite YAG/Nd:YAG transparent ceramics for high-power lasers** [8206-68]
J. Li, W. Liu, Shanghai Institute of Ceramics (China); J. Liu, Shanghai Institute of Ceramics (China) and Jiangsu Univ. (China); Y. Zeng, X. Ba, B. Jiang, Y. Shen, L. Wang, Shanghai Institute of Ceramics (China); G. Jin, Shanghai Normal Univ. (China); Q. Liu, Jiangsu Univ. (China); Y. Pan, J. Guo, Shanghai Institute of Ceramics (China)
- 8206 20 **Selection of different sintering aids and morphology modification of the Y_2O_3 powders for $\text{Yb}^{3+}:\text{Y}_3\text{Al}_5\text{O}_{12}$ transparent ceramics** [8206-69]
C. Chen, S. Zhou, H. Lin, Q. Yi, Shanghai Institute of Optics and Fine Mechanics (China)

NONLINEAR LASER CRYSTAL I

- 8206 22 **Structural and spectral investigations on heavily Er^{3+} doped RETaO_4 (RE = Sc, Y, Gd, Lu) polycrystalline powders** [8206-71]
P. Zhou, Anhui Institute of Optics and Fine Mechanics (China) and Graduate Univ. of Chinese Academy of Sciences (China); Q. Zhang, Anhui Institute of Optics and Fine Mechanics (China); K. Ning, H. Yang, Anhui Institute of Optics and Fine Mechanics (China) and Graduate Univ. of Chinese Academy of Sciences (China); D. Sun, J. Luo, S. Yin, Anhui Institute of Optics and Fine Mechanics (China)

NONLINEAR LASER CRYSTAL II

- 8206 26 **Czochralski growth and optical investigations of $\text{Er}^{3+}:\text{GdTaO}_4$ laser crystal** [8206-75]
H. Yang, Anhui Institute of Optics and Fine Mechanics (China) and Graduate Univ. of Chinese Academy of Sciences (China); Q. Zhang, Anhui Institute of Optics and Fine Mechanics (China); P. Zhou, K. Ning, J. Gao, Anhui Institute of Optics and Fine Mechanics (China) and Graduate Univ. of Chinese Academy of Sciences (China); Y. He, China Electronics Technology Group Corp. (China); J. Luo, D. Sun, S. Yin, Anhui Institute of Optics and Fine Mechanics (China)
- 8206 28 **Preparation, crystal structure, spectra and energy levels of the trivalent ytterbium ion doped into rare earth stannates** [8206-77]
K. Ning, Anhui Institute of Optics and Fine Mechanics (China) and Graduate Univ. of Chinese Academy of Sciences (China); Q. Zhang, D. Sun, S. Yin, H. Jiang, Anhui Institute of Optics and Fine Mechanics (China)

NONLINEAR LASER CRYSTAL III

- 8206 2B **Study on the properties of the DKDP crystal with different deuterium content** [8206-80]
M. Xu, Z. Wang, B. Liu, S. Ji, X. Sun, X. Xu, Shandong Univ. (China)
- 8206 2F **Study on fourth harmonic generation of DKDP crystal** [8206-84]
S. Ji, S. Zhang, M. Xu, B. Liu, L. Zhu, L. Zhang, X. Xu, Z. Wang, X. Sun, Shandong Univ. (China)

- 8206 2G **Laser damage threshold and nonlinear optical properties of large aperture elements of YCOB crystal** [8206-85]
 Y. Zheng, A. Wu, P. Gao, X. Tu, Shanghai Institute of Ceramics (China); X. Liang, Shanghai Institute of Optics and Fine Mechanics (China); J. Hou, L. Yang, Chengdu Fine Optical Engineering Research Ctr. (China); T. Wang, Shanghai Institute of Optics and Fine Mechanics (China); L. Qian, Shanghai Jiao Tong Univ. (China); E. Shi, Shanghai Institute of Ceramics (China)
- 8206 2H **Study of the laser-induced damage in DKDP crystal** [8206-86]
 B. Liu, Shandong Univ. (China); L. Ji, Shanghai Institute of Laser Plasmas (China); G. Hu, Y. Zhao, Shanghai Institute of Optics and Fine Mechanics (China); M. Xu, S. Ji, L. Zhu, L. Zhang, Z. Wang, X. Sun, X. Xu, Shandong Univ. (China)

Author Index

Conference Committees

Conference Chair

Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China)

Conference Cochairs

Koji Sugioka, RIKEN (Japan)

Christopher J. Stolz, Lawrence Livermore National Laboratory (United States)

Program Committee

Takahisa Jitsuno, Osaka University (Japan)

Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

Zunqi Lin, Shanghai Institute of Optics and Fine Mechanics (China)

Richard Moncorgé, ENSICAEN (France)

Detlev Ristau, Laser Zentrum Hannover e.V. (Germany)

Wolfgang Rudolph, The University of New Mexico (United States)

Takunori Taira, Institute for Molecular Science (Japan)

Zhouling Wu, Rx Technologies Co. Ltd. (China)

Xiaomin Zhang, China Academy of Engineering Physics (China)

Jiping Zou, Ecole Polytechnique (France)

Technical Committee

Edith Bourret-Courchesne, Lawrence Berkeley National Laboratory (United States)

Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China)

Takunori Taira, Institute for Molecular Science (Japan)

Jiping Zou, Ecole Polytechnique (France)

Local Organizing Committee

Ya Cheng, Shanghai Institute of Optics and Fine Mechanics (China)

Yaping Dai, Chinese Academy of Engineering Physics (China)

Hongbo He, Shanghai Institute of Optics and Fine Mechanics (China)

Guixue Huang, National High Technology Research and Development Program 863 (China)

Yuxin Leng, Shanghai Institute of Optics and Fine Mechanics (China)

Zunqi Lin, Shanghai Institute of Optics and Fine Mechanics (China)

Xu Liu, Zhejiang University (China)

Liejia Qian, Shanghai Jiao Tong University (China)
Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China)
Zhanshan Wang, Tongji University (China)
Shengming Xiong, Institute of Optics and Electronics (China)
Qiao Xu, Chinese Academy of Engineering Physics (China)
Kui Yi, Shanghai Institute of Optics and Fine Mechanics (China)
Long Zhang, Shanghai Institute of Optics and Fine Mechanics (China)
Xiaomin Zhang, Chinese Academy of Engineering Physics (China)

Session Chairs

- 1 Plenary Session
Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China)
Wanguo Zheng, China Academy of Engineering Physics (China)
- 2 Ultrafast Through CW Laser Irradiation Effects
Yuxin Leng, Shanghai Institute of Optics and Fine Mechanics (China)
Kui Yi, Shanghai Institute of Optics and Fine Mechanics (China)
- 3 High Laser Damage Resistant Coatings I
Qiao Xu, Chengdu Fine Optical Engineering Research Center (China)
Hongbo He, Shanghai Institute of Optics and Fine Mechanics (China)
- 4 High Laser Damage Resistant Coatings II
Wolfgang Rudolph, The University of New Mexico (United States)
Zhanshan Wang, Tongji University (China)
- 5 High-Power Laser Damage: UV Through IR I
Jiping Zou, Ecole Polytechnique (France)
Ya Cheng, Shanghai Institute of Optics and Fine Mechanics (China)
- 6 High-Power Laser Damage: UV Through IR II
Zhonghua Shen, Nanjing University of Science & Technology (China)
Xiaomin Zhang, China Academy of Engineering Physics (China)
- 7 Defects, Contamination, Polishing, and Surface Damage
Takahisa Jitsuno, Osaka University (Japan)
Jian Chen, RX Technologies Ltd. (China)
- 8 Laser Ablation and Laser Machining
Koji Sugioka, RIKEN (Japan)
Tetsuya Makimura, University of Tsukuba (Japan)
- 9 Characterization Techniques and Measurement Protocols
Jean-Yves Natoli, Institut Fresnel (France)
Christian Mühlig, Institut für Photonische Technologien e.V. (Germany)

- 10 Laser Ceramics I
 Richard Moncorgé, ENSICAEN (France)
 Jun Xu, Shanghai Institute of Optics and Fine Mechanics (China)

- 11 Optical Glass and Fiber
 Mauro Tonelli, Università di Pisa (Italy)
 Satoshi Wada, RIKEN (Japan)

- 12 Laser Ceramics II
 Mauro Tonelli, Università di Pisa (Italy)
 Satoshi Wada, RIKEN (Japan)

- 13 Nonlinear Laser Crystal I
 Mauro Tonelli, Università di Pisa (Italy)
 Satoshi Wada, RIKEN (Japan)

- 14 Nonlinear Laser Crystal II
 Zhanggui Hu, Technical Institute of Physics and Chemistry (China)
 Long Zhang, Shanghai Institute of Optics and Fine Mechanics (China)

- 15 Nonlinear Laser Crystal III
 Benxue Jiang, Shanghai Institute of Ceramics (China)
 Jian-Rong Qiu, South China University of Technology (China)

Introduction

The first Pacific Rim Laser Damage Symposium: Optical Materials for High Power Lasers (PLD 2011), organized by the SPIE and Shanghai Institute of Optics and Fine Mechanics (SIOM), successfully took place at the Blue Palace Hotel in Shanghai on 6-9 Nov 2011. The conference was devoted at high level to the recent developments in mechanism, simulation, modeling, characterization and resistance on laser damage of optical materials, and in advanced optical materials with high potentially applied for high power laser. The main topics included: i) high power laser damage (UV through IR), ii) ultrafast through CW laser irradiation effects, iii) laser ablation and laser machining, iv) high laser damage resistant coatings, v) characterization techniques and measurement protocols in laser damage, vi) defects, contamination, polishing, and surface damage, vii) mechanisms, modeling and simulations, viii) nonlinear laser crystals, ix) laser ceramics, and x) optical glass and fibers.

In this three-day conference, there are 90 papers accepted for oral presentations: contributed by over 100 researchers from more than 8 countries, including United States, Germany, France, Japan, Canada, Italy, Czech Republic, and China. Three high-level plenary presentations were given by Prof. Jianda Shao (SIOM, China), Prof. Koji Sujioka (RIKEN, Japan) and Prof. Wanguo Zheng (China Academy of Engineering Physics, China), and 16 invited talks in 10 topical areas were given by world-renown scientists and experts in the field.

This conference provided an excellent opportunity for researchers to communicate efficiently and to exchange information on new problems, solutions, and technologies in the field of laser damage as well as optical materials, and also contribute to enhancement of understanding between each other and facilitate closer collaborations among participating researchers.

The success of the first Pacific Rim Laser Damage Symposium (PLD 2011) resulted from the efforts of many people with special thanks to the members of the International Advisory Committee and the members of the Organizing Committee. We are indebted to the following organizations and companies for their efforts and financial supports to 2011 PLD: SPIE, Chinese Academy of Science (CAS), Chinese Optical Society, 863 Program, Horiba Scientific Inc., Panalytical, and Newport. We are grateful to SPIE staff the conference co-chairs, Mr. Christopher Stolz and Prof. Koji Sujioka, for their powerful support on launching this conference. We also wish to thank Honhbo He, Long Zhang, and Chaoyang Wei for their invaluable help with the organization and administration of the symposium. Finally, we would like to thank to all invited and regular speakers who contributed toward raising the level of the conference.

Jianda Shao
Koji Sugioka
Christopher J. Stolz