2013 Pacific Rim Laser Damage

Optical Materials for High-Power Lasers

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Conferences
19–22 May 2013

Location
Courtyard Shanghai Jiading by Marriott
Shanghai, P. R. China

Co-organized by

SPIE

SIOM 中国科学院上海光学精密机械研究所
Shanghai Institute of Optics & Fine Mechanics Chinese Academy of Science

Cooperating Organizations:

CHINESE OPTICAL SOCIETY

CHINESE ACADEMY OF SCIENCES

SPIE/SIOM Pacific Rim Laser Damage

Optical Materials for High-Power Lasers

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Courtyard Shanghai Jiading by Marriott
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Welcome

On behalf of the Organizing Committee and the International Advisory Committee, we cordially welcome you to the SPIE Pacific Rim Laser Damage Symposium: Optical Materials for High-Power Lasers. The symposium is co-hosted by SIOM and SPIE. We have organized a leading international conference for presenting novel and fundamental advances in the fields of optical materials for high-power lasers. We also intend to provide 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. We hope that this conference will contribute to enhancement of understanding between each other and facilitate closer collaborations among participating researchers.

This symposium includes both oral and poster presentations. The selected papers from the conference presentations will be published by SPIE. Nearly 30 distinguished international experts in the field of optics/materials for the higher power/energy lasers will address invited talks.

Welcome to Shanghai!

Conference Chairs:

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

Takahisa Jitsuno
Osaka Univ. (Japan)

Wolfgang Rudolph
The Univ. of New Mexico (USA)

International Program Committee

Norbert Kaiser, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)
Efim A. Khazanov, Institute of Applied Physics (Russian Federation)
Zunqi Lin, Shanghai Institute of Optics and Fine Mechanics (China)
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Richard Moncorgé, ENSICAEN (France)
Jean-Yves Natoli, Institut Fresnel (France)
Valdas Sirutkaitis, Vilnius Univ. (Lithuania)
Christopher J. Stolz, Lawrence Livermore National Lab. (USA)
Koji Sugioka, RIKEN (Japan)
Takunori Taira, Institute for Molecular Science (Japan)
Mauro Tonelli, Univ. di Pisa (Italy)
Eric W. Van Stryland, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA)
Zhouling Wu, Rx Technologies, Ltd. (China)
Xiaomin Zhang, China Academy of Engineering Physics (China)
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)
Liejia Qian, Shanghai Jiao Tong Univ. (China)
Kui Yi, Shanghai Institute of Optics and Fine Mechanics (China)
Long Zhang, Shanghai Institute of Optics and Fine Mechanics (China)

Daily Schedule of Events

TIME	SUNDAY 19 May
14:00 to 17:30	**Registration and Material Pick-Up** · Lobby, Courtyard Shanghai Jiading Hotel
18:00 to 19:30	**Social Mixer** · MoMo Cafe (1st floor)
	MONDAY 20 May
7:30 to 16:00	**Registration and Material Pick-Up** · Lobby, Courtyard Shanghai Jiading Hotel
8:00 to 8:30	**Overview of 2012 Laser Damage Symposium in Boulder** · Session Chair: Jianda Shao
8:30 to 10:25	**SESSION 1. High Power Laser Damage, UV through IR I** · Session Chairs: Takahisa Jitsuno, Hongbo He **PLENARY PRESENTATION. Femtosecond to nanosecond laser damage in dielectric materials**, Wolfgang Rudolph
10:45 to 12:00	**SESSION 2. Laser Ablation and Laser Machining I** · Session Chairs: Ya Cheng, Zhouling Wu
12:00 to 13:25	Lunch Break
13:25 to 15:10	**SESSION 3. Laser Ablation and Laser Machining II** · Session Chairs: Jean-Yves Natoli, Jiping Zou
15:30 to 17:45	**SESSION 4. Laser Ceramics** · Session Chairs: Takunori Taira, Efim A. Khazanov
18:00 to 20:00	**Welcome Reception and Dinner** · Banquet Room A (3rd floor)
	TUESDAY 21 May
7:30 to 16:00	**Registration and Material Pick-Up** · Lobby, Courtyard Shanghai Jiading Hotel
8:00 to 10:10	**SESSION 5. Defects, Contamination, Polishing, and Surface Damage** · Session Chairs: Jianda Shao, Valdas Sirutkaitis **PLENARY PRESENTATION. The application of advanced optical manufacturing in high power laser irradiated optics,** Shengyi Li
10:10 to 11:20	**POSTER SESSION**
11:20 to 12:20	**SESSION 6. Nonlinear Laser Crystals I** · Session Chairs: Long Zhang, Hongbo He
12:20 to 13:30	Lunch Break
13:30 to 15:25	**SESSION 7. High Laser Damage Resistant Coatings** · Session Chairs: Valdas Sirutkaitis, Jean-Yves Natoli **PLENARY PRESENTATION. Recent progresses on insights of laser damage mechanisms and influence of contamination in optics,** Takahisa Jitsuno, Hidetoshi Murakami, Kota Kato, Eiji Sato, Katsuhiro Mikami, Shinji Motokoshi, Noriaki Miyanaga
15:45 to 18:25	**SESSION 8. Nonlinear Laser Crystals II** · Session Chairs: Mauro Tonelli, Long Zhang **PLENARY PRESENTATION. Advanced application and progress of high-power DUV laser,** Qinjun Peng
	WEDNESDAY 22 May
7:30 to 11:00	**Registration and Material Pick-Up** · Lobby, Courtyard Shanghai Jiading Hotel
8:00 to 9:55	**SESSION 9. Characterization Techniques and Measurement Protocols** · Session Chairs: Takahisa Jitsuno, Wolfgang Rudolph **PLENARY PRESENTATION. Laser-based spectroscopy and spectrometry,** Yong Feng Lu, Xiang Nan He, Xi Huang
9:55 to 11:05	**POSTER SESSION**
11:05 to 12:35	**SESSION 10. Optical Glasses and Fibers** · Session Chairs: Jiping Zou, Mauro Tonelli
12:35 to 13:45	Lunch Break
13:45 to 15:40	**SESSION 11. High Power Laser Damage, UV through IR II** · Session Chairs: Jianda Shao, Eric W. Van Stryland **PLENARY PRESENTATION. How increasing the damage threshold and spectral bandwidth of diffraction gratings for pulse compression applications?,** Nicolas Bonod
16:00 to 18:40	**SESSION 12. High Power Laser Damage, UV through IR III** · Session Chairs: Wolfgang Rudolph, Yong Feng Lu **PLENARY PRESENTATION. Fundamental mechanisms of laser-induced damage in optical materials: today state of understanding and problems,** Alexander A. Manenkov
19:30 to 21:15	**Chinese Acrobatic Show**

Social Mixer

Sunday 19 May · 18:00 to 19:30 · MoMo Cafe (1st floor)

Be sure to come to the social mixer Sunday. Network with your colleagues and other conference attendees. Tickets are included in the conference registration fee.

Welcome Reception and Dinner

Monday 20 May · 18:00 to 20:00 · Banquet Room A (3rd floor)

All registered conference attendees are invited to attend the welcome reception and dinner on Monday evening. This event will allow time to meet others at the conference and learn more about the research happening across the Laser Damage field.

Lunches

Monday and Tuesday 20-21 May · MoMo Cafe (1st floor)

Lunches for Monday and Tuesday are included for attendees. Tickets are in the registration packet.

Chinese Acrobatic Show

Wednesday 22 May · 19:30 to 21:15

Tickets are optional with your registration. You can purchase your tickets while onsite (Guest tickets available for purchase).

The history of acrobatics in China can be traced back to Neolithic times. It is believed that acrobatics grew out of the labor and self-defense skills that the people practiced and demonstrated during their leisure time.

When you watch a Chinese Acrobatic Show, you are strongly impacted both mentally and physically. It is truly an unforgettable experience.

Buses will pick you up at the Courtyard Shanghai Jiading by Marriott and return you after the event is over.

Conference 8786

Sunday - Wednesday 19–22 May 2013 • Proceedings of SPIE Vol. 8786

Pacific Rim Laser Damage 2013: Optical Materials for High Power Lasers

Conference Chairs: **Jianda Shao,** Shanghai Institute of Optics and Fine Mechanics (China); **Takahisa Jitsuno,** Osaka Univ. (Japan); **Wolfgang Rudolph,** The Univ. of New Mexico (United States)

Program Committee: **Norbert Kaiser,** Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); **Efim A. Khazanov,** Institute of Applied Physics (Russian Federation); **Zunqi Lin,** Shanghai Institute of Optics and Fine Mechanics (China); **Yong Feng Lu,** Univ. of Nebraska-Lincoln (United States); **Alexander A. Manenkov,** A. M. Prokhorov General Physics Institute (Russian Federation); **Richard Moncorgé,** ENSICAEN (France); **Jean-Yves Natoli,** Institut Fresnel (France); **Valdas Sirutkaitis,** Vilnius Univ. (Lithuania); **Christopher J. Stolz,** Lawrence Livermore National Lab. (United States); **Koji Sugioka,** RIKEN (Japan); **Takunori Taira,** Institute for Molecular Science (Japan); **Mauro Tonelli,** Univ. di Pisa (Italy); **Eric W. Van Stryland,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); **Zhouling Wu,** ZC Optoelectronic Technologies, Ltd. (China); **Xiaomin Zhang,** China Academy of Engineering Physics (China); **Jiping Zou,** Ecole Polytechnique (France)

Symposium Plenary Speaker Schedule

Monday 20 May

8:30 to 9:10
Femtosecond to nanosecond laser damage in dielectric materials), Wolfgang Rudolph, The Univ. of New Mexico (United States) . . . . . [8786-1]

Tuesday 21 May

8:00 to 8:40
The application of advanced optical manufacturing in high power laser irradiated optics, Shengyi Li, National Univ. of Defense Technology (China) . . . . . [8786-23]

13:30 to 14:10
Recent progresses on insights of laser damage mechanisms and influence of contamination in optics, Takahisa Jitsuno, Osaka Univ. (Japan); Hidetoshi Murakami, Kota Kato, Osaka Univ. (Japan) and Promotion Ctr. for Laser Technology (Japan); Eiji Sato, Katsuhiro Mikami, Shinji Motokoshi, Noriaki Miyanaga, Osaka Univ. (Japan) . . . . . [8786-33]

15:45 to 16:25
Advanced application and progress of high-power DUV laser, Qinjun Peng, Technical Institute of Physics and Chemistry (China) . . . . . [8786-38]

Wednesday 22 May

8:00 to 8:40
Laser-based spectroscopy and spectrometry, Yong Feng Lu, Xiang Nan He, Xi Huang, Univ. of Nebraska-Lincoln (United States) . . . . . [8786-44]

13:45 to 14:25
How increasing the damage threshold and spectral bandwidth of diffraction gratings for pulse compression applications?, Nicolas Bonod, Institut Fresnel (France) . . . . . [8786-51]

16:00 to 16:40
Fundamental mechanisms of laser-induced damage in optical materials: today state of understanding and problems, Alexander A. Manenkov, A. M. Prokhorov General Physics Institute (Russian Federation) . . . . . [8786-55]

Sunday 19 May

Registration and Material Pick-Up

14:00 to 17:30

Lobby, Courtyard Shanghai Jiading Hotel

Social Mixer

18:00 to 19:30 · MoMo Cafe (1st floor)

Be sure to come to the social mixer Sunday in the MoMo Cafe (1st floor) to network with your colleagues and other conference attendees. Tickets are included in the conference registration fee.

Monday 20 May

Overview of 2012 Laser Damage Symposium in Boulder

8:00 to 8:30

Session Chair: **Jianda Shao,**
Shanghai Institute of Optics and Fine Mechanics (China)

SESSION 1 . . . . . Mon 8:30 to 10:25

High Power Laser Damage, UV through IR I

Session Chairs: **Takahisa Jitsuno,** Osaka Univ. (Japan);
Hongbo He, Shanghai Institute of Optics and Fine Mechanics (China)

8:30: **Femtosecond to nanosecond laser damage in dielectric materials** *(Plenary Presentation)*, Wolfgang Rudolph, The Univ. of New Mexico (United States) . . . . . [8786-1]

9:10: **Optical damage limits in chalcogenide nonlinear crystals used in 1064nm pumped nanosecond optical parametric oscillators** *(Invited Paper)*, Valentin P. Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany) . . . . . [8786-2]

9:40: **Comparative study of fused silica and oxyfluoride glass on laser-induced initial damage morphology**, Qiang Cheng, China Academy of Engineering Physics (China); Wei Wei, Nanjing Univ. of Posts and Telecommunications (China) . [8786-3]

9:55: **Laser-induced transient absorption and fluorescence of K9 glass by ultraviolet laser irradiation**, Zhen Zhang, Laser Fusion Research Ctr. (China) . . . . . [8786-4]

10:10: **Laser damage threshold of optical materials and components for high-intensity lasers**, Frank Elsmann, Ralf Jedamzik, SCHOTT AG (Germany); Todd Jaeger, SCHOTT North America, Inc. (United States); Antonello Nesci, SCHOTT Suisse SA (Switzerland) . . . . . [8786-88]

Coffee Break . . . . . Mon 10:25 to 10:45

SESSION 2. . . . . Mon 10:45 to 12:00

Laser Ablation and Laser Machining I

Session Chairs: **Ya Cheng,** Shanghai Institute of Optics and Fine Mechanics (China); **Zhouling Wu,** ZC Optoelectronic Technologies, Ltd. (China)

10:45: **Laser damage and ablation with femtosecond pulses: recent measurements and applications** *(Invited Paper)*, Olivier P. Uteza, Raphael Clady, Maxime Lebugle, Nicolas Sanner, Marc L. Sentis, Nadezda Varkentina, Lasers, Plasmas et Procédés Photoniques (France) . . . . . [8786-5]

11:15: **Nd:YAG laser conditioning of KDP crystals investigated using nondestructive optical diagnostics**, De Cheng Guo, Univ. of Electronic Science and Technology of China (China) and Laser Fusion Research Ctr. (China); Xiaotao Zu, Univ. of Electronic Science and Technology of China (China); Xiaodong Jiang, Laser Fusion Research Ctr. (China). . . . . [8786-68]

11:30: **Towards high-quality laser ablation of glass**, Wolfgang Schulz, Fraunhofer-Institut für Lasertechnik (Germany) and RWTH Aachen Univ. (Germany); Urs Eppelt, RWTH Aachen Univ. (Germany); Claudia Hartmann, Fraunhofer-Institut für Lasertechnik (Germany); Christof Siebert, TRUMPF Laser- und Systemtechnik GmbH (Germany). . . . . [8786-9]

11:45: **Design and development of an automated laser processing system for photovoltaic applications**, Jianhua Zhao, Jian Chen, Zhouling Wu, ZC Optoelectronic Technologies Ltd. (China). . . . . [8786-10]

Lunch Break . . . . . Mon 12:00 to 13:25

SESSION 3 . . . . . Mon 13:25 to 15:10

Laser Ablation and Laser Machining II

Session Chairs: **Jean-Yves Natoli,** Institut Fresnel (France); **Jiping Zou,** Ecole Polytechnique (France)

13:25: **Laser-induced damage in porous glass: a pathway to 3D fabrication of micro-/nanofluidics** *(Invited Paper)*, Ya Cheng, Yang Liao, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-11]

13:55: **Investigation of the femtosecond laser damage and ablation by time-resolved digital holography** *(Invited Paper)*, Valdas Sirutkaitis, Andrius Melninkaitis, Viaceslav Kudriašov, Vilnius Univ. (Lithuania) . . . . . [8786-12]

14:25: **Volumetric modifications in fused silica using Gaussian and Bessel femtosecond laser beams**, Domas Paipulas, Mindaugas Mikutis, Valdas Sirutkaitis, Vilnius Univ. (Lithuania) . . . . . [8786-13]

14:40: **Laser cutting of ultra-thin glasses based on a nonlinear laser interaction effect**, Jian Chen, Zhouling Wu, ZC Optoelectronic Technologies Ltd. (China) . . . . . [8786-14]

14:55: **Novel beam manipulation methods for laser damage control and their application in 3D micromachining**, Fei He, Ya Cheng, Zhizhan Xu, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-15]

Coffee Break . . . . . Mon 15:10 to 15:30

SESSION 4 . . . . . Mon 15:30 to 17:45

Laser Ceramics

Session Chairs: **Takunori Taira,** Institute for Molecular Science (Japan); **Efim A. Khazanov,** Institute of Applied Physics (Russian Federation)

15:30: **Highlight and achievements of polycrystalline ceramic laser materials** *(Invited Paper)*, Georges Boulon, Univ. Claude Bernard Lyon 1 (France) and CNRS (France) . . . . . [8786-16]

16:00: **Fabrication of rare-earth doped sesquioxide ceramics for novel laser application** *(Invited Paper)*, Hui Lin, Nanyang Technological Univ. (Singapore); Jian Zhang, Hao Yang, Hao Chen, DeYuan Shen, Jiangsu Normal Univ. (China); Ding Yuan Tang, Nanyang Technological Univ. (Singapore) . . . . . [8786-17]

16:30: **Impact of giant microphotonics at pulse gap** *(Invited Paper)*, Takunori Taira, Institute for Molecular Science (Japan) . . . . . [8786-18]

17:00: **Progress in the transparent ceramics research in SIOM**, Shengming Zhou, Hui Lin, Chong Chen, Xuezhuan Yi, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-19]

17:15: **Highly-transparent Nd:YAG laser ceramics fabricated by solid state reactive sintering**, Jiang Li, Wenbin Liu, Yubai Pan, Jingkun Guo, Shanghai Institute of Ceramics (China) . . . . . [8786-20]

17:30: **Hot-pressed Cr:ZnSe/ZnS ceramics as mid-infrared laser materials**, Min Chen, Benxue Jiang, Yubai Pan, Xiqi Feng, Wei Li, Jiang Li, Shanghai Institute of Ceramics (China) . . . . . [8786-22]

Welcome Reception and Dinner

18:00 to 20:00 · Banquet Room A (3rd floor)

All registered conference attendees are invited to attend the welcome reception and dinner on Monday evening. Held in the Banquet Room A (3rd floor), this event will allow time to meet others at the conference and learn more about the research happening across the Laser Damage field.

SPIE/SIOM would like to express its deepest appreciation to the symposium chairs, conference chairs, program committees, session chairs, and authors who have so generously given their time and advice to make this symposium possible.

The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members. This program is based on commitments received up to the time of publication and is subject to change without notice.

Tuesday 21 May

SESSION 5 . . . . . Tue 8:00 to 10:10

Defects, Contamination, Polishing, and Surface Damage

Session Chairs: **Jianda Shao,** Shanghai Institute of Optics and Fine Mechanics (China); **Valdas Sirutkaitis,** Vilnius Univ. (Lithuania)

8:00: **The application of advanced optical manufacturing in high power laser irradiated optics** *(Plenary Presentation)*, Shengyi Li, National Univ. of Defense Technology (China) . . . . . [8786-23]

8:40: **Research of micron-scale particles removal by ultrasonic cleaing method with artifical silica particles**, Tao Ding, Abudusalamu Tuniyazi, Zhengxiang Shen, Xinbin Cheng, Tongji Univ. (China) . . . . . [8786-24]

8:55: **Effect of pulse energy and numbers on fused silica surface by ultraviolet laser pulses at 355nm in vacuum**, Xiaoyan Zhou, China Academy of Engineering Physics (China) . . . . . [8786-25]

9:10: **Study of surface modification on fused silica optics by inductively coupled $CF_4/Ar/O_2$ plasma**, Sun Laixi, China Academy of Engineering Physics (China) . . . . . [8786-26]

9:25: **Improved the laser damage resistance of fused silica by removing the subsurface damage layer and impurities with HF-based processes**, Xiaolong Jiang, Univ. of Science and Technology of China (China) . . . . . [8786-27]

9:40: **A new polishing process for large-aperture and high-precision aspheric surface**, Nie Xu Qing, Li Sheng Yi, DaiYi Fan, Song Ci, National Univ. of Defense Technology (China) . . . . . [8786-28]

9:55: **Using light scattering to investigate damage-relevant imperfections of surfaces, coatings, and bulk materials**, Sven Schröder, Marcus Trost, Tobias Herffurth, Angela Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany). . . . . [8786-29]

POSTERS—TUESDAY/WEDNESDAY . Tue 10:10 to 11:20 and Wed. 11:05 to 12:35

The following posters will be on display Tuesday and Wednesday.

The effect of hardening on ablation rate in aluminum alloys (zeolites) and crater profile development analogized with meteorite craters, Osama M. Khalil, Cairo Univ. (Egypt). . . . . [8786-61]

Research on noncritically phase-matched fourth harmonic-generation of partially deuterated ADP crystal, ShaoHua Ji, Shandong Univ. (China); Fang Wang, China Academy of Engineering Physics (China); Lili Zhu, Xiangxu Chai, Baoan Liu, Lisong Zhang, Mingxia Xu, Xinguang Xu, Xun Sun, Zhengping Wang, Shandong Univ. (China). . . . . [8786-62]

A research of weak adsorption measurements in crystal based on photothermal interferometry, Bing Chen, Zong-kai Liu, Shiwu Wang, CRYSTECH Inc. (China) . . . . . [8786-63]

Annular polishing of large-aperture Nd-doped metaphosphate glass, Haiyang Shan, Xueke Xu, Hongbo He, Fulin Wu, Kui Yi, Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-64]

Downstream beam modulation induced by plasma scalds in laser-conditioned 1064nm HR thin film, Weixiao Chen, Dawei Li, Xiaofeng Liu, Jianbo Wu, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-65]

Experimental simulation of radioactive decontamination with excimer laser, Zhi-Xing Gao, Xiuzhang Tang, Meihua Ma, Zhentao Zhang, China Institute of Atomic Energy (China). . . . . [8786-66]

Properties optimization of $Tb_3Al_5O_{12}$ transparent ceramics as Faraday magneto-optical materials, Chong Chen, Shengming Zhou, Hui Lin, Xuezhuan Yi, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-67]

Phase shift of polarized light through sculptured TiO_2 thin film: experimental results and theoretical studies, Yongqiang Hou, Xu Li, Kai He, Hongji Qi, Ming Fang, Kui Yi, Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-69]

Multipulse laser damage in HfO_2 /SiO_2 high-reflective coatings at 1064nm, Wenwen Liu, Chaoyang Wei, Dawei Li, Kui Yi, Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-70]

Rheological properties of magnetorheological fluid and its finishing application on large aperture BK7 glass, Chao Wang, Qilong Wei, Wen Huang, Qing Luo, Jianguo He, Guangpin Tang, China Academy of Engineering Physics (China) . . . . . [8786-71]

Simulation study on the influence of subsurface deficiency on fused silica laser damage threshold, Lizi Chen, Zhen Xiang, Chunyuan Jing, Zhejiang Univ. (China) . . . . . [8786-72]

Properties of MgF_2 thin films for 193nm ArF laser applications, Jian Sun, Xu Li, Weili Zhang, Kui Yi, Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-73]

Stress-induced waveguide written by femtosecond laser in phosphate glass, Mingming Dong, Quan-Zhong Zhao, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-74]

Temperature dependence of 355nm laser-induced damage in thin-film coatings, Zhenkun Yu, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-75]

Research on microcracks avoidance in processing of α-Al_2O_3 by ultrashort laser pulses, Cheng-Wei Wang, Shanghai Institute of Optics and Fine Mechanics (China) and Chinese Academy of Sciences (China); Quan-Zhong Zhao, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-76]

Characteristics of hydrolyzed layer and contamination on fused silica-induced during polishing, Defeng Liao, Chengdu Fine Optical Engineering Research Ctr. (China) . . . . . [8786-77]

Metamaterial Mach-Zehnder Interferometers with arbitrary geometries, Yingying Li, National Univ. of Defense Technology (China) . . . . . [8786-79]

Infrared analysis of optical fiber cladding materials during the quenching, irradiating, and annealing process, Wenkai Wu, Jianchong Yin, Zhongyin Xiao, Wenyun Luo, Jianxiang Wen, Tingyun Wang, Shanghai Univ. (China) . . . . [8786-80]

Broadband and high-efficiency metal-multilayer dielectric grating centered at 800nm based on non-quarter wave coatings as reflective mirror, Weijin Kong, Qingdao Univ. (China) . . . . . [8786-81]

Femtosecond laser pulses drilling shaped microhole of turbine blade, Haini Jia, Xiaojun Yang, Wei Zhao, Xi'an Institute of Optics and Precision Mechanics (China); Xu Du, National Time Service Ctr. (China) and Chinese Academy of Sciences (China) . . . . . [8786-82]

Controllable optical limiting of graphene by changing atmosphere pressure, Xin Cheng, Ningning Dong, Jun Wang, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-83]

Optical and thermal properties of a new Nd-doped phosphate laser glass, Weiwei Li, Shanghai Institute of Optics and Fine Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); Dongbing He, Shanghai Institute of Optics and Fine Mechanics (China) and Key Laboratory of Materials for High Power Laser,Shanghai Institute of Optics and Fine Mechanics (China); Shunguang Li, Wei Chen, Shubin Chen, Lili Hu, Shanghai Institute of Optics and Fine Mechanics (China). . . . . [8786-84]

Using of optical breakdown to ablate heart tissue for multifetal pregnancy reduction, Qiuyang Xiong, Zhejiang Univ. (China) . . . . . [8786-85]

Defect structure and optical damage resistance of In:Er:$LiNbO_3$ crystals, Ting Sun, Xiaodong Zhang, Harbin Institute of Technology (China); Liang Sun, Harbin Institute of Technology (China) and Yibin Univ. (China); Rui Wang, Harbin Institute of Technology (China) . . . . . [8786-89]

Study on solid-state laser ablation effect of laser proof composite coating applied in aerospace material, Jing Li, Beijing Institute of Aeronautical Materials (China); Yi Zheng, Chengdu Fine Optical Engineering Research Ctr, (China) . . . . . [8786-90]

SESSION 6 . . . . . Tue 11:20 to 12:20

Nonlinear Laser Crystals I

Session Chairs: **Long Zhang,** Shanghai Institute of Optics and Fine Mechanics (China); **Hongbo He,** Shanghai Institute of Optics and Fine Mechanics (China)

11:20: **Multi-functional and self-frequency-doubling crystals** *(Invited Paper)*, Jiyang Wang, Shandong Univ. (China) . . . . . [8786-30]

11:50: **Transverse stimulated Raman scattering gain coefficient measurement in KDP crystal**, Yajing Guo, Shunxing Tang, Hong-Chao Hui, Yuyu Wang, Qing Tang, Baoqiang Zhu, Zunqi Lin, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-31]

12:05: **Diode-pumped neodymium-doped ASL laser**, Lihe Zheng, Pascal Loiseau, Gerald P. Aka, Ecole Nationale Supérieure de Chimie de Paris (France) . . . . . [8786-32]

Lunch Break . . . . . Tue 12:20 to 13:30

SESSION 7 . . . . . Tue 13:30 to 15:25

High Laser Damage Resistant Coatings

Session Chairs: **Valdas Sirutkaitis,** Vilnius Univ. (Lithuania); **Jean-Yves Natoli,** Institut Fresnel (France)

13:30: **Recent progresses on insights of laser damage mechanisms and influence of contamination in optics** *(Plenary Presentation)*, Takahisa Jitsuno, Osaka Univ. (Japan); Hidetoshi Murakami, Kota Kato, Osaka Univ. (Japan) and Promotion Ctr. for Laser Technology (Japan); Eiji Sato, Katsuhiro Mikami, Shinji Motokoshi, Noriaki Miyanaga, Osaka Univ. (Japan). . . . . [8786-33]

14:10: **Research on the laser damage performance of high-reflection coatings at 355nm** *(Invited Paper)*, Meiping Zhu, Jianda Shao, Kui Yi, Xu Li, Zhenkun Yu, Weili Zhang, Hongji Qi, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-34]

14:40: **Damage threshold of multilayer thin-films at MHz repetition rates**, Ivan B. Angelov, Ludwig-Maximilians-Univ. München (Germany) and Max-Planck-Institut für Quantenoptik (Germany); Maximilian von Pechmann, Ludwig-Maximilians-Univ. München (Germany); Michael K. Trubetskov, Max-Planck-Institut für Quantenoptik (Germany) and Lomonosov Moscow State Univ. (Russian Federation); Oleg Pronin, Ludwig-Maximilians-Univ. München (Germany); Ferenc Krausz, Max-Planck-Institut für Quantenoptik (Germany) and Ludwig-Maximilians-Univ. München (Germany); Vladimir Pervak, Ludwig-Maximilians-Univ. München (Germany) . . . . . [8786-35]

14:55: **Effect of laser conditioning on the LIDT of multilayer HfO_2/SiO_2 thin films**, Jie Liu, Shanghai Institute of Optics and Fine Mechanics (China) . . [8786-36]

15:10: **Optimization of near-field optical field of metal multilayer dielectric gratings for pulse compressor**, Heyuan Guan, Yunxia Jin, Shijie Liu, Fanyu Kong, Yin Du, Kai He, Kui Yi, Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-37]

Coffee Break . . . . . Tue 15:25 to 15:45

SESSION 8 . . . . . Tue 15:45 to 18:25

Nonlinear Laser Crystals II

Session Chairs: **Mauro Tonelli,** Univ. di Pisa (Italy); **Long Zhang,** Shanghai Institute of Optics and Fine Mechanics (China)

15:45: **Advanced application and progress of high-power DUV laser** *(Plenary Presentation)*, Qinjun Peng, Technical Institute of Physics and Chemistry (China) . . . . . [8786-38]

16:25: **The rapid growth of large-dimension and high-quality KDP crystals** *(Invited Paper)*, Yuangen Yao, Fujian Institute of Research on the Structure of Matter (China) . . . . . [8786-39]

16:55: **Garnet crystals with disordered structures** *(Invited Paper)*, Haohai Yu, Huaijin Zhang, Kui Wu, Shuxian Wang, Shandong Univ. (China) . . . . . [8786-40]

17:25: **Fluoride crystals: materials for near-infrared solid state lasers** *(Invited Paper)*, Mauro Tonelli, Univ. di Pisa (Italy) . . . . . [8786-41]

17:55: **Preparation and optical characterization of Cr:ZnSe single crystal**, Yongjun Dong, Shanghai Institute of Optics and Fine Mechanics (China) . [8786-42]

18:10: **Passively Q-switched $Tm:BaY_2F_8$ lasers**, Valentin P. Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Haohai Yu, Shandong Univ. (China); Uwe Griebner, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Daniela Parisi, Scuola Normale Superiore di Pisa (Italy); Yuangeng Zhang, Shandong Univ. (China); Stefano Veronesi, Mauro Tonelli, Univ. di Pisa (Italy) . . . . . [8786-43]

Wednesday 22 May

SESSION 9 . . . . . Wed 8:00 to 9:55

Characterization Techniques and Measurement Protocols

Session Chairs: **Takahisa Jitsuno,** Osaka Univ. (Japan); **Wolfgang Rudolph,** The Univ. of New Mexico (United States)

8:00: **Laser-based spectroscopy and spectrometry** *(Plenary Presentation)*, Yong Feng Lu, Xiang Nan He, Xi Huang, Univ. of Nebraska-Lincoln (United States) . . . . . [8786-44]

8:40: **Influence of the test parameters on LIDT determination for single and multiple laser irradiations in optical components** *(Invited Paper)*, Jean-Yves Natoli, Frank R. Wagner, Céline Gouldieff, Mireille Commandré, Institut Fresnel (France) . . . . . [8786-45]

9:10: **Nonlinear spectroscopy of absorption and refraction** *(Invited Paper)*, Eric W. Van Stryland, David J. Hagan, Honghua Hu, Manuel Ferdinandus, Matthew C. Reichert, Trenton Ensley, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States) . . . . . [8786-46]

9:40: **Study of photothermal response in thin film coatings by ellipsometry**, Jian Chen, Wei Wang, Zhouling Wu, ZC Optoelectronic Technologies Ltd. (China) . . . . . [8786-47]

POSTER SESSION . . . . . Wed 9:55 to 11:05

SESSION 10 . . . . . Wed 11:05 to 12:35

Optical Glasses and Fibers

Session Chairs: **Jiping Zou,** Ecole Polytechnique (France); **Mauro Tonelli,** Univ. di Pisa (Italy)

11:05: **Fibers single-crystals grown by micro-pulling down (μ-PD) technique: an opportunity for simple laser component design** *(Invited Paper)*, Lebbou Kheirreddine, Univ. Claude Bernard Lyon 1 (France) . . . . . [8786-48]

11:35: **High power Thulium-doped pulsed fiber lasers for supercontinuum generation in mid-IR nonlinear fibers** *(Invited Paper)*, Pu Wang, Beijing Univ. of Technology (China) . . . . . [8786-49]

12:05: **Microstructure-composited materials: A new type of high-power laser materials?** *(Invited Paper)*, Long Zhang, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-50]

Lunch Break . . . . . Wed 12:35 to 13:45

SESSION 11 . . . . . Wed 13:45 to 15:40

High Power Laser Damage, UV through IR II

Session Chairs: **Jianda Shao,** Shanghai Institute of Optics and Fine Mechanics (China); **Eric W. Van Stryland,** CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

13:45: **How increasing the damage threshold and spectral bandwidth of diffraction gratings for pulse compression applications?** *(Plenary Presentation)*, Nicolas Bonod, Institut Fresnel (France) . . . . . [8786-51]

14:25: **Mega-science Project eXawatt Center for Extreme Light Studies (XCELS)** *(Invited Paper)*, Efim Khazanov, Institute of Applied Physics of RAS (Russian Federation) . . . . . [8786-52]

14:55: **Research and construction progress of the SG-III Laser Facility** *(Invited Paper)*, Qi-hua Zhu, China Academy of Engineering Physics (China) . . . . . [8786-53]

15:25: **Water resistent and high-power laser coating of Nd:glass in water-cooling system**, Zhi Song, Xinbin Cheng, Tongji Univ. (China) and Institute of Precision Optical Engineering (China); Zhanshan Wang, Tongji Univ. (China) . . . . . [8786-54]

Coffee Break . . . . . Wed 15:40 to 16:00

SESSION 12 . . . . . Wed 16:00 to 18:40

High Power Laser Damage, UV through IR III

Session Chairs: **Wolfgang Rudolph,** The Univ. of New Mexico (United States); **Yong Feng Lu,** Univ. of Nebraska-Lincoln (United States)

16:00: **Fundamental mechanisms of laser-induced damage in optical materials: today state of understanding and problems** *(Plenary Presentation)*, Alexander A. Manenkov, A. M. Prokhorov General Physics Institute (Russian Federation). . . . . [8786-55]

16:40: **Laser-induced damage thresholds at different temperature for optical devices** *(Invited Paper)*, Katsuhiro Mikami, Osaka Univ. (Japan) and The Japan Society of Applied Physics (Japan); Shinji Motokoshi, Toshihiro Somekawa, Takahisa Jitsuno, Masayuki Fujita, Kazuo A. Tanaka, Osaka Univ. (Japan). . . . . [8786-56]

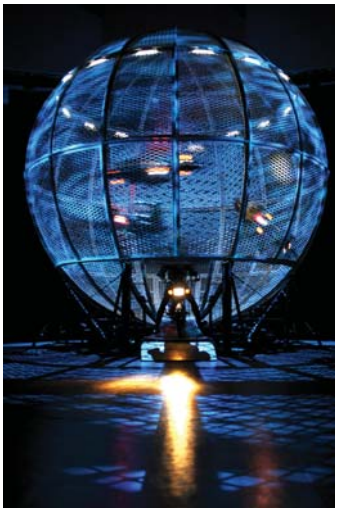
17:10: **Optical aspect of ultrashort laser ablation on transparent dielectrics** *(Invited Paper)*, Yi Liu, Yohann Brelet, Ecole Nationale Supérieure de Techniques Avancées (France); Zhanbing He, Univ. Antwerpen (Belgium); Linwei Yu, Ecole Polytechnique (France); Sergey I. Mitryukovskiy, Aurélien Houard, Benjamin Forestier, Ecole Nationale Supérieure de Techniques Avancées (France); Arnaud Couairon, Ecole Polytechnique (France); André Mysyrowicz, Ecole Nationale Supérieure de Techniques Avancées (France) . . . . . [8786-87]

17:40: **Coherently combined beams 'Death Star' effect in silicon and fused silica**, William P. Parker, Creative Microsystems Corp. (United States). . . . [8786-6]

17:55: **Development of a "turn-key" system for weak absorption measurement and analysis**, Jian Chen, Wei Wang, Zhouling Wu, ZC Optoelectronic Technologies Ltd. (China) . . . . . [8786-58]

18:10: **Laser-induced-damage threshold of periodically poled lithium niobate for 1030nm femtosecond laser pulses at 100 kHz and 75 MHz**, Ieva Pipinyte, Rimantas Grigonis, Karolina Stankeviciute, Vilnius Univ. (Lithuania); Simonas Kicas, Ramutis Drazdys, Institute of Physics (Lithuania); Robert C. Eckardt, Gooch & Housego, Cleveland (United States); Valdas Sirutkaitis, Vilnius Univ. (Lithuania) . . . . . [8786-59]

18:25: **Ultraviolet laser-induced damage growth characteristic and mechanism on the surface of fused silica**, Zhou Fang, Yuanan Zhao, Guohang Hu, Shunli Chen, Dawei Li, Jianda Shao, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [8786-60]



Chinese Acrobatic Show

Wednesday 22 May · 19:30 to 21:15

Tickets are optional with your registration. You can purchase your tickets while onsite (Guest tickets available for purchase).

The history of acrobatics in China can be traced back to Neolithic times. It is believed that acrobatics grew out of the labor and self-defense skills that the people practiced and demonstrated during their leisure time.

When you watch a Chinese Acrobatic Show, you are strongly impacted both mentally and physically. It is truly an unforgettable experience.

Buses will pick you up at the Courtyard Shanghai Jiading by Marriott and return you after the event is over.

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