AOMATT CHINA 2008

The 4th SPIE International Symposium on

Advanced Optical Manufacturing and Testing Technologies

中国光学学会
The Chinese Optical Society

中国科学院光电技术研究所
THE INSTITUTE OF OPTICS AND ELECTRONICS
THE CHINESE ACADEMY OF SCIENCES

The International Society for Optical Engineering

Technical Program

Chengdu China
19-21 November 2008

AOMATT 2008 Daily Event Schedule General

Date	***Time***	***Content***	***Place***
TUE. Nov. 18, 2008	9:00-22:00	Registration	Lobby of Wufu Buldoing of Chengdu Wang Jiang Hotel
Morning WED. Nov. 19, 2008	8:30-8:50	Opening Ceremony	Auditorium of Chengdu Wang Jiang Hotel
	8:50-12:30	Plenary 1-6	Auditorium of Chengdu Wang Jiang Hotel
Lunch Time			
Afternoon And Evening WED. Nov. 19, 2008	13:30-17:10	Session 1-1 Session 2-1 Session 3-1 Session 4-1	Conference room1 Conference room2 Conference room3 Conference room4
	18:30-20:30	Welcome Banquet	Banquet Hall of Chengdu Wang Jiang Hotel
Morning THU. Nov. 20, 2008	8:30-12:10	Session 1-2 Session 2-2 Session 3-2 Session 4-2	Conference room1 Conference room2 Conference room3 Conference room4
Afternoon And Evening THU. Nov. 20, 2008	13:00-17:00	Post Presentation Workshop On New products and technology	Auditorium 1 and 2 Chengdu Wang Jiang Hotel
	18:30-20:30	Closing Ceremony	
FRI. Nov. 21, 2008	The whole day	Touring around City of Chengdu	
SAT. Nov. 22, 2008	The conference closing		After Nov. 22, 2008 Self Payment Touring

AOMATT China 2008 Organizing Committee • Tel/Fax +86 028 85100583 • aomatt08@ioe.ac.cn

AOMATT 2008

The 4th SPIE International Symposium on

Advanced Optical Manufacturing and Testing Technologies

19-21 November 2008
Wang Jiang Hotel
Chengdu China

Sponsored by:

COS - The Chinese Optical Society
IOE - Institute of Optics and Electronics,
- Chinese Academy of Sciences
SPIE - The International Society of Optical Engineering
- (*Technical Co-Sponsor*)

Supported by:

Ministry of Science and Technology of China
Chinese Academy of Sciences (CAS)
National Natural Science Foundation of China

Honorary Chair:

WANG Daheng, Academician, CAS & CAE (China)

Symposium General Chair:

ZHOU Bingkun, President of Chinese Optical Society (COS), Academician, CAS

Four Conferences:

1 Large Mirror and Telescopes
2 Advanced Optical Manufacturing Technologies
3 Optical Test and Measurement Technology and Equipments
4 Design, Manufacturing and Testing of Micro and Nano Optical Devices and Systems

AOMATT 2008

AOMATT 2008 Technical Program Contents

Advanced Optical Manufacturing and Testing Technologies

19-21 November 2008
Chengdu China

INVITATION

Dear Authors and Friends!

After the world known earthquake in May 12, 2008 in Wenchuan of Sichuan, the city of Chengdu is still more beautiful full of smooth and steady, the 4th International Symposium on Advanced Optical Manufacturing and Testing Technologies will be no any change following the initial schedule to be held in Chengdu in Nov.19-21, 2008.

Advanced optical manufacturing and testing technology has become an important interdisciplinary field between optical sciences and manufacturing sciences. They are closely associated with technologies development of information, bioscience, materials and nano technologies. At the same time, optical manufacturing has been developed into a new huge global high tech. business. So that the international symposium of AOMATT has become more and more popular time by time in domestic and abroad.

On behalf of the organization committee of the symposium, I would like sincerely to invite you to participate in the AOMATT08 and to submit your abstracts and manuscripts to the conference in time. Your submitting is a kind support not only to the conference but also to the Afflicted Area of Wenchuan Earthquake some how and some what. We believe that Chengdu and also the successful symposium of AOMATT08 will leave you a pleasant and impressive memory.

We are looking forward to meeting you at the symposium in Chengdu.

Sincerely

Prof. ZHANG Yudong
Chairman of the Organization Committee of AOMATT08
Director of the Institute of Optics & Electronics, CAS

AOMATT 2008 Technical Program Organizations & Committees

Sponsored by:

COS - The Chinese Optical Society

中国光学学会
The Chinese Optical Society

IOE - Institute of Optics and Electronics, Chinese Academy of Sciences

中国科学院光电技术研究所
THE INSTITUTE OF OPTICS AND ELECTRONICS
THE CHINESE ACADEMY OF SCIENCES

SPIE - The International Society of Optical Engineering (*Technical Co-Sponsor*)

The International Society for Optical Engineering

Cooperating Organizations:

- Committee of Optical Manufacturing Technology, COS
- State Key Lab.of Opt.Tech. for Microfablication (China)
- SOS - Sichuan Optical Society

Supported by:

- Ministry of Science and Technology of China
- Chinese Academy of Sciences (CAS)
- National Natural Science Foundation of China

Honorary Chair:

WANG Daheng, Academician, Chinese Academy of Sciences and Chinese Academy of Engineering (China)

Symposium General Chair:

ZHOU Bingkun, President of Chinese Optical Society (COS), Academician, Chinese Academy of Sciences

Symposium General Co-chairs:

James C. Wyant, Director of Optical Sciences Center, Univ. of Arizona (USA)

CAO Jianlin, Vice Director, Ministry of Science and Technology of China

ZHANG Yudong, Director of the Institute of Optics and Electronics (IOE), Chinese Academy of Sciences

Organizing Committee:

ZHANG Yudong Director of Institute of Optics and Electronics, CAS (China), Chair

CAO Jinghua, Deputy Director General of Bureau of International Cooperation, Chinese Academy of Science, Co-Chair

NI Guoqiang, Secretary General of Chinese Optical Society (COS), Co-Chair

Jos Benschop, System Engineering and Research, ASML (Netherland)

John M. Schoen, Center for Optical Manufacturing, University of Rochester (USA)

Edgar Bader, Lithographic Optics Division, Carl Zeiss SMT AG(Germany)

YANG Li, Committee of Optical Manufacturing Technology (COMT), COS (China)

Jinxue Wang, SPIE (USA)

Eric RUCH, REOSC Optics, SAGEM (France)

Jim Burge, University of Arizona(USA)

David D. Walker, University College Landon (U.K)

Yoshiharu Namba, Chubu University (Japan)

Hexin Wang, Optical Technology Carl Zeiss AG (Germany)

Masaomi Kameyama, Nikon Corporation (Japan)

WU Fan, Institute of Optics and Electronics, CAS (China)

Rongbin Li, Hong Kong Polytechnic University (Hong Kong)

Tadashi Hatano,Tohoku University(Japan)

LI Jingzhen,Shenzhen University (China)

Mike DeMarco, QED Technologies (USA)

James R.Torley,University of Colorado(USA)

LI Xiaoping, Shanghai Micro Electronic Equipment Co Ltd China)

Robert Smythe, ZYGO Corporation (USA)

Richard Freeman, ZEEKO Ltd (UK)

Gaven F.Chapmam, Moore Precision Tool (USA)

Program Committee:

YANG Hu, Vice director of Institute of Optics and Electronics, CAS (China), Chair

QIN Yuwen, Natural Science Foundation of China, Co-Chair

Sen Han, Veeco,Co. (USA) Co-Chair

Myung K.CHo, NOAO,(USA) Co-Chair

Bernard Delabre, ESO (Germany)

YU Huadong, Changchun University of Science and Technology (China)

Magomed A.Abdulkadyrov, Lytkarino Optical Glass Factory(Russia)

Jose M. Sasian, University Arizona(USA)

Ming liu, Institute of Microelectronics,CAS (China)

XIN Qiming, Beijing Institute of Technology (China)

LI Wei, Chengdu Fine Precision Optical Engineering Research Centre (China)

Paul Kloceck, ELCAN Optical Technologies (USA)

YU Jingchi, Suzhou Univ. (China)

CHENG Xuemin,Tsinghua University (China)

ZHANG Xuejun, Changchun Institute of Fine Mechanics and Physics, CAS (China)

Mary G. Turner, InfoTek Information Systems (USA)

Han Changyuan, Optical Testing Technology Committee, COS (China)

Masahide Katsuki, Toshiba Machine Co.Ltd(Japan)

Liang Ying Chun, Harbin Institute of Technology(China)

Matthias Pfaff, OptoTech Optikmaschinen GmbH (Germany)

Michael Sander, Satisloh GmbH (Germany)

Thomas Danger, Schneider GmbH (Germany)

Mike Conroy, Taylor Hobson Limited (England)

Secretary General of the Symposium:

YANG Li, Committee of Optical Manufacturing Technology, COS

Jinxue Wang, SPIE Technical Advisor (USA)

Symposium General Chair:

Prof. Zhou Bingkun, President of Chinese Optical Society (COS), Academician, Chinese Academy of Sciences

Prof. Zhou Bingkun was born in Sichuan, China in 1936. He graduated from Tsinghua University, Beijing, China in 1956. Since 1956 he has been with the Electronic Engineering Department at the same University. From 1960 to 1962 he was a visiting scholar at Leningrad Electrotechnical Institute, Leningrad , former USSR . From 1983 to 1984 he was a visiting scholar and then professor of Applied Physics Department, Stanford University, U.S.A. From 1985, he has been a professor of Electronic Engineering Department at Tsinghua University, Beijing, China. He was elected as a member of Chinese Academy of Sciences in 1991 and was elected as a member of the Third world Academy of Sciences in 2001. At present he is president of the Chinese Optical Society and vice-chairman of the science and technology committee of Ministry of Education. He was the vice-president of the National Natural Science Foundation of China(1996-2003), director of Information Science Department of CAS(2003-2006), the Chairman of the Steering Committee of Optoelectronic Devices and System Integration Technology, High Technology Research & Development Program of China and the Director of National Research Center for Optoelectronic Technology, Beijing(1987-1996). He is fellow of the Optical Society of America and Chinese Institute of Electronics.

He has been engaged in laser and optoelectronics research and teaching for a long time. In 1984, He made key contributions to development of diode pumped, narrow linewidth and frequency stable Solid State Lasers. He with his research group has made scientific research achievements in the area of “Single Mode, Narrow Linewidth, Frequency-Stable and Tunable External Cavity Semiconductor Lasers”; “semiconductor laser pumped solid state laser”; “fiber ring cavity and their application”; “doped fiber amplifiers and lasers” and “DWDM optical fiber transmission technology”. He has won 11 national and ministry-level prizes. He is the author or co-authors of about 100 papers, presentations, patents and one book : “ Laser Principle” , which was awarded the state excellent prize.

Symposium General Co-Chair:

Dr. ZHANG Yudong, President of Institute of Optics and Electronics, CAS (China)

Dr. Zhang Yudong, PhD and Research Professor, President of IOE (Institute of Optics and Electronics), CAS (Chinese Academy of Sciences) is a member of the Appraisal Expert Team of Information Directorate of NSFC (National Natural Science Foundation of China), a vice-chair of Bio-optics and Laser Medicine Subcommittee of COS (Chinese Optical Society), a vice-Chair of Electro-Optical Specialty Committee of Chinese Society of Astronautics, and a committeeman of Quantum Electronics and Electro-Optical Subcommittee of CIE (Chinese Institute of Electronics), an adjunct professor of UESTC (University of Electronic Science and Technology of China) and Zhejiang University respectively.

Dr. Zhang received his BS from Zhejiang University in 1984, his MS from IOE in 1987, and his PhD from Shanghai Institute of Optics and Fine Mechanics, CAS, in 1991. From 1991 to 1997 he held the technical posts of Research Assistant, Research Associate Professor and Research Professor in Fujian Institute of Research on the Structure of Matter, CAS. He has been working in IOE since 1998 and serving as President since 2003.

For more than 10 years, he has carried out many frontier researches in the fields of adaptive optics, microlithography and new materials of non-linear optics and has obtained many innovative achievements which are leading in China or advanced in the world. He has won one first-grade award of CAS Prize for S&T Progress and CAS Prize for Invention respectively. Altogether, he has applied for and obtained 38 pieces of patents, and published more than 50 theses among which 30 are included in EI Database and 10 in SCI Database.

From 1985 to 1987, he participated in the development of Wavefront Correction System with Dither Technology for the ICF (Inertial Confinement Fusion) experiment in China and proposed an adaptive search method for multiple-extreme optimization. It is the first time to successfully apply the adaptive optical technology to laser atomic fusion system in the world.

From 1998 to 1991, he engaged in the development of Submicron Excimer Laser Lithography System, which worked out the first prototype system in China. He successfully developed the precision submicron objective lens which was the core component of the system and obtained two related patents.

From 1991 to 1997, he took part in the research into new nonlinear optical crystal materials and related devices, obtained five national invention patents and won one first-grade award of CAS Prize for Invention.

From1998 to present, he has been taking charge of the development of the adaptive optical (AO) system for imaging live human eye retina with high resolution. The system is the first practical compact AO system for this application in the world.

He is also in charge of the development of Dynamic Wavefront Correction AO System for the new generation of ICF prototype system in China. It is the first AO system which can reduce the wavefront distortion of laser beam in ICF system from 9λ to about 1.5λ in China. This extends the application of adaptive optics in the ICF field and is at the advanced world level.

AOMATT 2008 Daily Event Schedule General

Date	Time	Content	Place
TUE. Nov. 18, 2008	9:00-22:00	Registration	Lobby of Wufu Buldoing of Chengdu Wang Jiang Hotel
Morning WED. Nov. 19, 2008	8:30-8:50	Opening Ceremony	Auditorium of Chengdu Wang Jiang Hotel
	8:50-12:30	Plenary 1-6	Auditorium of Chengdu Wang Jiang Hotel
Lunch Time			
Afternoon And Evening WED. Nov. 19, 2008	13:30-17:10	Session 1-1 Session 2-1 Session 3-1 Session 4-1	Conference room1 Conference room2 Conference room3 Conference room4
	18:30-20:30	Welcome Banquet	Banquet Hall of Chengdu Wang Jiang Hotel
Morning THU. Nov. 20, 2008	8:30-12:10	Session 1-2 Session 2-2 Session 3-2 Session 4-2	Conference room1 Conference room2 Conference room3 Conference room4
Afternoon And Evening THU. Nov. 20, 2008	13:00-17:00	Post Presentation Workshop On New products and technology	Auditorium 1 and 2 Chengdu Wang Jiang Hotel
	18:30-20:30	Closing Ceremony	
FRI. Nov. 21, 2008	The whole day	Touring around City of Chengdu	
SAT. Nov. 22, 2008	The conference closing		After Nov. 22, 2008 Self Payment Touring

Morning WED. Nov. 19, 2008

Plenary Presentation

8:30-8:50----Opening Ceremony /Chiar: YANG li (Secretary General of AOMATT08)

8:50-12:30---Plenary Presentation

For Session 0-1, Plenary Presentation Order No.1-3 /Chair: Dr.JinxueWang (Vice Secretary General of AOMATT08, Representative of SPIE, USA)/

For Session 0-2, Plenary Presentation Order No.4-6 /Chair:Dr. SenHan (SPIE Fellow,Chair of Conference4 of AOMATT08, USA)

	Order	Time	Presentation	Title of the lecture	Note
Session 0-1	1	8:50-9:25	Dr. Myung K. Cho	Design and Development of the Telescope Optics for the Thirty MeterTelescope (TMT) (USA)	NOAO, U.S.A
	2	9:25-10:00	Dr. Eric RUCH	Gran Telescopio Canarias optics: A step towards the Extremely Large Telescope REOSC (France)	SAGEM Défense Sécurité REOSC Department France
	3	10:00-10:35	Dr. Mike DeMarco	Sub-aperture Stitching Interferometry(SSI®) and Magneto-rheological Finishing (MRF®) of precision optics from millimeter to multi-meter size	QED,USA
10:35-10:45 Tea Break					
Session 0-2	4	10:45-11:20	Dr. Richard Freeman	A review of the evolving technologies relevant to the production of ultra-precision free-form surfaces.	Zeeko Ltd Unitd Kindom.
	5	11:20-11:55	Prof. Fritz Klocke	Advances in Optical Manufacturing Technologies at Fraunhofer IPT	Fraunhofer Institute Germany
	6	11:55-12:30	Dr. Masaomi Kameyama	The Evolution of Wavelength Shrinkage in Lithography	Nikon Corporation (Japan)

WED. Nov. 19, 2008---- THU. Nov. 20, 2008 (including chair)

AOMATT 2008 Session Schedule and Session Chair

	Time	Conf 1	Conf 2	Conf 3	Conf 4	Post	workshop
		Room 1	Room 2	Room 3	Room 4	Auditorium 1	Auditorium 2
Nov. 19, 2008	13:30 -17:10	Session 1-1 Chair Prof. Wu Fan	Session 2-1 Chair Dr. Wan Yongjian	Session 3-1 Chair Prof. Wu Shibin	Session 4-1 Chair Dr. Luo Xian gang		
Nov. 20, 2008	8:30 -12:10	Session 1-2 Dr. Chair Fan Bin	Session 2-2 Chair Dr. Zhang Rongzhu	Session 3-2 Chair Dr. Jin Hongwei	Session 4-2 Chair Dr. Yao Jun		
Nov. 20, 2008	13:00 -17:00						New products and technology
Nov. 20, 2008	13:00 -14:00					Poster Preparation	
Nov. 20, 2008	14:00 -17:00					Poster	

Wednesday 19 November 2008

AOMATT 2008 Opening Ceremony

8:30 to 8:50 am
Auditorium of Chengdu Wang Jiang Hotel
Chair: Yang Li (CHINA)

AOMATT2008 Plenary Talk

8:50 at to 12:30 am
Auditorium of Chengdu Wang Jiang Hotel

Chair :Dr.JinxueWang (USA)
Dr. SenHan (USA)

P.P. Session 0-1

Chair: Dr.JinxueWang (USA)

8:50-9:25 Myung K.Cho
9:25-10:00 Eric RUCH
10:00-10:35 Mike DeMarco

P.P. Session 0-2

Chair: Dr. SenHan (USA)

10:45-11:20 Richard Freeman
11:20-11:55 Fritz Klocke
11:55-12:30 Masaomi Kameyama

Plenary Talk 1

Design and Development of the Telescope Optics for the Thirty MeterTelescope (TMT)

Dr. Myung K.Cho
National Optical Astronomy Observatory (USA)

ABSTRACT
The Thirty Meter Telescope Project is a collaboration of the California Institute of Technology, the University of California, and the Association of Canadian Universities for Research in Astronomy. This telescope will be used for research in astronomy at visible and infrared wavelengths and its optical design is a Ritchey-Chrétien. The telescope is a 30 meter diameter f/15 system with a segmented primary mirror (M1); a 3.2 meter diameter, convex secondary mirror (M2); and an elliptical (3.5 meter in major axis and 2.5 meter in minor axis) flat tertiary mirror (M3). These will deliver an f/15 beam to adaptive optic systems and science instruments located on two Nasmyth platforms. This talk will describe an overview of the telescope optical systems (M1, M2, and M3) of TMT. Current design concepts, status of developments, and the optical performances of the telescope optics will be addressed.

BRIEF BIOGRAPHY
Dr. Myung Cho servers as a principal engineer at the National Optical Astronomy Observatory (NOAO). He has been involved in the design and development of the optical telescopes and optical instruments including the Thirty Meter Telescope Project, the Advanced Technology Solar Telescope, the Large Synoptic Survey Telescope, the GEMINI 8m Telescopes, the WIYN 3.5m telescope, Gemini Near Infrared Spectrograph, and a variety of other telescopes and optical systems. Prior to joining NOAO, he was on the faculty at the College of Optical Sciences at the University of Arizona. Dr. Cho also serves as an adjunct professor at the Engineering Mechanics and the College of Optical Sciences. He earned his Ph.D. from the University of Arizona in 1989.

Plenary Talk 2

Gran Telescopio Canarias optics: A step towards the Extremely Large Telescope

Dr. Eric RUCH
SAGEM Défense Sécurité REOSC Department France

ABSTRACT
The REOSC High Performance Optics Department of SAGEM Défense Sécurité has been selected by GRANTECAN SA to manufacture the Gran Telescopio Canarias Zerodur primary mirror segments and the lightweighted Beryllium secondary mirror. The first set of six hexagonal, 1,8 m point to point, primary mirror segments has been delivered in March 2004 and the last batch of segments in December 2005. The secondary mirror has been delivered in March 2006. The paper will present the project and the optical requirements of the telescope primary and secondary mirrors. The technology developments that were made in the field of optical manufacturing as well as mechanical and optical metrology will be presented. Final optical performance of the 42 segments of the primary mirror and the secondary mirror will be reported.
Several recent studies have been undertaken to analyze the requirements of the next generation of Extremely Large Telescope optics, in which several hundreds of segments will have to be produced in a limited time frame. Based on the experience gained on the production of the segments of the Gran Telescopio Canarias, we will present the challenges that will face the optical manufacturing community to be able to produce these segments at a rate and a price compatible with the budgets available for the ELT projects.

BRIEF BIOGRAPHY
Eric Ruch is graduate in optical engineering from the Institute of Optics in Paris . He has joined REOSC in 1985, has work in lens design and has been project manager for several space and astronomy projects. Since 2006, he is responsible for the business development for the space and the astronomy

activities of the REOSC department in SAGEM.

Plenary Talk 3

Sub-aperture Stitching Interferometry(SSI®) and Magneto-rheological Finishing (MRF®) of precision optics from millimeter to multi-meter size

Dr.Mike DeMarco
QED,USA

ABSTRACT:
Today's optical designs often call for surfaces with increasingly larger clear apertures, higher numerical apertures, and tighter figure error tolerances. Optics manufacturers are challenged with smaller batch sizes, shorter lead times, and increasing competition from overseas producers: all of this during a period of dwindling optician resources that the industry has relied on for many years. Modern optics shops are transitioning from traditional manufacturing approaches to the adoption of CNC grinding and polishing tools, in particular, deterministic processes such as MRF.
However, the optics finishing process is only as good as the metrology that feeds it. Metrology tools used to measure optical surfaces must keep pace with advances in manufacturing. Commercially available interferometers for optical surface testing are severely limited in the size and numerical aperture of the surfaces they can measure. Furthermore, the accuracy of the measurements is limited by the quality of reference artifacts, or the reliability of complicated absolute calibration methods.

BRIEF BIOGRAPHY
Mike DeMarco, Sales Manager for QED Technologies, has spent his entire career in the fields of precision optics manufacturing and optical system assembly and testing. He has been on QED's Marketing and Sales team since 2001. Prior to joining QED, he managed the Optical Assembly and Test Department for Perkin Elmer and SVG Lithography Systems in Wilton, CT.
His academic background includes an MBA degree in Marketing and Operations from the University of Connecticut, and a BS degree in Optical Engineering from the University of Rochester. He is the author of many articles and papers in his chosen fields of interest.

Plenary Talk 4

A review of the evolving technologies relevant to the production of ultra-precision free-form surfaces

Dr. Richard Freeman
Zeeko Ltd
Unitd Kindom

ABSTRACT
Over the last ten years a number of technologies and additional techniques have emerged to enable the efficient and deterministic production of free-form ultra-precision surfaces. Included in this area of development are ultra-precision grinders, generators, polishers and single point diamond turning machines. These machines must then be supported by free-form metrology solutions as well as new ways to fabricate the near net shape substrates essential for the efficient production of such surfaces. Included here are the precision moulding of glass, techniques for forming ceramics, the use of slumping, electroforming, rapid prototyping, sintering and other precision forming techniques. From these building blocks of technology have appeared production solutions that a decade ago would not have seemed feasible and this paper discusses these solutions and the process chains that they have created. Almost all such processes include the requirement for a near net shape substrate, a precision forming technology, a measurement solution and a finishing technology. The paper examines the solutions available, as well as some of the latest ones to emerge commenting on where they have been adopted thus far.

BRIEF BIOGRAPHY
Richard Freeman is Managing Director of Zeeko Ltd, a fast growing hi-technology manufacturing company based in the UK. Zeeko Ltd designs, develops and builds machines for the corrective polishing of free-form surfaces as used in high precision optics, precision moulds, orthopaedic implants and components for the tool and die industry. In addition Zeeko has recently introduced a number of metrology products for the measurement of free-form ultra-precision surfaces.
He is a mechanical engineer by qualification. Formerly Richard was Managing Director of Rank Taylor Hobson (Worldwide) – responsible for both the Measurement Division, the diamond turning business (at that time named Rank Pneumo – and now absorbed by Precitech), as well as the Cooke precision lens business.
He was for some years a member of the Measurement Advisory Committee to the UK Government. Zeeko Ltd was formed in late 2000 and since then, building it to a position of influence in this tightly defined area has been his single minded focus.

Plenary Talk 5

Advances in Optical Manufacturing Technologies at Fraunhofer IPT

Prof. Fritz Klocke
GERMANY

Dr. Richard Zunke
GERMANY

ABSTRACT
The Fraunhofer IPT is conducting a great variety of research activities in the field of optics manufacturing whereby both ways, direct and replicative manufacturing, are addressed. Important technologies are ductile and ELID grinding; conventional and ultrasonic assisted diamond turning; polishing, coating and precision glass molding of complex optical components. The research group focuses on developing transparent, deterministic material removal mechanisms and cutting models. The group then transposes these theoretical models into industrial practice. CAx technologies are used to maintain the necessary flexibility and accuracy of the machine control to manufacture a great variety of geometries from planar to free form. The aim is to provide components which feature surface qualities in the nanometer range and form accuracies in the submicron range.
The modern equipment combined with the latest measurement technology to research and optimize the above mentioned technologies matches the increasing demands of the industry. The facilities provide the opportunity to efficiently research the according technologies but also manufacture complex glass surfaces such as large aspheric optics with high dimensional accuracy or large glass substrate surfaces with small structures in the micro-meter range. Additionally, the institute covers the whole process chain for precision glass molding, from mold and die making to coating technologies up to glass molding itself. In this context, the institute and the spin-off Aixtooling provide molds and, among other services, feasibility studies mainly for the European market.

BRIEF BIOGRAPHY
Professor Fritz Klocke was a research fellow at the TU Berlin at the Institute for Machine Tools and Manufacturing Technology until 1981, and then as head engineer until 1984, receiving his engineering doctorate in 1982. Professor Klocke worked at Ernst Winter & Sohn in Hamburg from 1984 until 1994. In 1995 he was called to the RWTH Aachen as Professor of Manufacturing Engineering Technology at the WZL Laboratory for Machine Tools & Production Engineering and the Fraunhofer Institute for Production Technology IPT.

Plenary Talk 6

The Evolution of Wavelength Shrinkage in Lithography

Dr.Masaomi Kameyama
Nikon Corporation (Japan)

ABSTRACT
Optical lithography has driven the development of miniaturization in the microelectronics industry, thus fulfilling the so-called Moore's Law. To achieve this lithographers have steadily reduced the wavelength of the illumination light used in the optical systems. However, this reduction has brought many challenges, as we have reduced the wavelength we are typically moving from the visible spectrum through ultra-violet and now towards the soft x-ray regime. The majority of these challenges are related to material properties. Reduction of wavelength narrows the available materials that are sufficiently transparent the further are radiation resistant. We also have a finite amount of wavelengths that can be produced with sufficient power to provide a production worthy light source. In this paper we will examine the history of wavelength transition in optical lithography explaining which material developments have allowed some wavelengths, such as 248nm, to be highly successful, while others such as 157nm and 126nm have failed.

BRIEF BIOGRAPHY
He received MS degree in Industrial Chemistry at Seikei University at 1975. He joined Nikon R & D Center in 1975, and then moved to Exposure Tool Designing Department in 1984. Since 1984, he has been in the center of Exposure Tool developments. He is the active member of ITRS Lithography ITWG and the ex-representative of Japan Lithography TWG in 2002 - 2005.

Workshop on

- **Topic： Technologies for Manufacturing Ultra-Precision Freeform Surfaces by Zeeko Ltd**
  Mr Richard Freeman
  Zeeko Ltd.,

  Time:13:00-14:00
  Place: Auditorium 1 at forth floor

- **Topic： The Automated Aspheric Manufacturing Cell - ACG 120 and ACP 120**
  Dr.Clemens Volker Heimlich
  Schneider Opticmachines

  Time:14:00-15:00
  Place: Auditorium 1 at forth floor

Tea Time 15:00-15:15

- **Topic： Precise Measurement of the Stress Birefringence Distribution in Optical Materials and Components**
  Mr. Henning Katte
  ilis Gmbh

- **Topic: Optical Metrology for Astronomical Optics**
  Mr. Stephen Martinek
  4D Technology

  Time:15:15-17:00
  Place: Auditorium 1 at forth floor

Asian Manager of Schneider Opticmachines

Dr. Clemens Volker Heimlich

TOPIC:

The Automated Aspheric Manufacturing Cell - ACG 120 and ACP 120

ABSTRACT

Aspheric machine - ACG120 and ACP120, which is developed through the combination between German Technological Departments, Schneider Ltd., Carl Zeiss AG and Jena Optical Ltd., is a one site machining system. It integrated the grinding, polishing and testing together. The aspheric auto-manufacture is completed for the first time.

Schneider Opticmachines with headquarters in Steffenberg, an hour north of Frankfurt/Germany, is a private-owned company with a successful growing business since 1986. 200 employees develop and manufacture high-end machines for the ophthalmic and precision-optical industry.

Powerful Partner in Shanghai
OEC Desino Zhenxia Technologies co.,ltd.
Asia Pacific Plaza A-1216
Huaqiao International Business Park
No.18. Zhaofeng Rd.
Huaqiao, Kunshan
215332 China

Address: 4 Vulcan Court
Vulcan Way
Coalville
Leicestershire
LE67 3FW
United Kingdom.
Tel: +44 1530 815 832
Fax: +44 1530 839 631
E-mail: info@zeeko.co.uk
Web: www.zeeko.co.uk
Contact Person: Mr Richard Freeman – Managing Director
richard.freeman@zeeko.co.uk

Product Name:
Zeeko Intelligent Robotic Polishers (IRP Machines) & associated software known as Precessions.

About Zeeko & Product Description:
Zeeko Ltd manufactures corrective polishing machines for fabricating high precision optics, orthopaedic joints, semiconductor applications and precision moulds in a number of different materials. The machines are supplied with software and processes suitable for the production of the most complex freeform artefacts. Covering a range of sizes from 1.5mm to 6m they utilise patented processes including the mechanical "ZeekoClassic" technology and the "ZeekoJet" solution. These cost effective solutions are deterministic and scalable from the smallest cell-phone requirements to the largest astronomy applications and are suitable for polishing most materials from traditional optics materials, through stainless steel, tool steels etc to both tungsten carbide and silicone carbide.

Topic: "A review of the evolving technologies relevant to the production of ultra-precision free-form surfaces."
By Mr Richard Freeman (Zeeko Ltd)

Abstract:
Over the last ten years a number of technologies and additional techniques have emerged to enable the efficient and deterministic production of free-form ultra-precision surfaces. Included in this area of development are ultra-precision grinders, generators, polishers and single point diamond turning machines. These machines must then be supported by free-form metrology solutions as well as new ways to fabricate the near net shape substrates essential for the efficient production of such surfaces. Included here are the precision moulding of glass, techniques for forming ceramics, the use of slumping, electroforming, rapid prototyping, sintering and other precision forming techniques. From these building blocks of technology have appeared production solutions that a decade ago would not have seemed feasible and this paper discusses these solutions and the process chains that they have created. Almost all such processes include the requirement for a near net shape substrate, a precision forming technology, a measurement solution and a finishing technology. The paper examines the solutions available, as well as some of the latest ones to emerge commenting on where they have been adopted thus far.

China exclusive agent :
Zhiwa Trading Co., Ltd.
1104, Summit Insurance Bldg.,
789 Nathan Road, Hong Kong.
Tel +852 2380 6080
Fax+852 2789 8656
e-mail : Zhiwa@hkstar.com
www.zhiwa.net

Topic： Precise Measurement of the Stress Birefringence Distribution in Optical Materials and Components

By Mr. Henning Katte
(ilis Gmbh)

Abstract： In demanding optical applications highly homogeneous glasses and crystals such as SiO2 and CaF2 are used. Due to the effect of stress birefringence, residual stresses in the material influence the polarization of light, which is unwanted in many optical applications, especially in the fields of micro lithography, laser optics and astronomy. In order to meet the increasing requirements regarding repeatability, lateral resolution and measuring speed, a new type of automated imaging polarimeters has been developed. The measuring apparatus determines the two-dimensional stress birefringence within a large field of view at a high lateral resolution and within a short measuring time.

Topic: Optical Metrology for Astronomical Optics

By Mr. Stephen Martinek
(4D Technology)

Abstract: Continuous advancement in wavefront sensors, adaptive optics and control systems have enabled a wide range of innovative light weight, high aspect ratio large aperture and segmented primary mirror designs for both ground and space based astronomical applications. The manufacture of these typically long radius and aspheric optical elements generate a variety of optical testing challenges. Dynamic interferometry systems provide a unique tool to address the challenges inherent in the component and system level testing ofthese optics and can provide high accuracy, repeatable results. Various dynamic interferometry technology approaches will be presented, trade-offs discussed and performance assessed.

www.OPT urn.com

OPTurn Company Limited with its headquarter in Beijing was established to promote equipments and instruments of the world first class into China. We focus on optical technology, covering manufacture, metrology, coating, alignment and protection..

OPTurn combines skills of more than 10 years on optical manufacture and testing, and experiences on business of more than 6 years.

OPTurn provides not only sales and marketing, but also constant technical support and consultation.

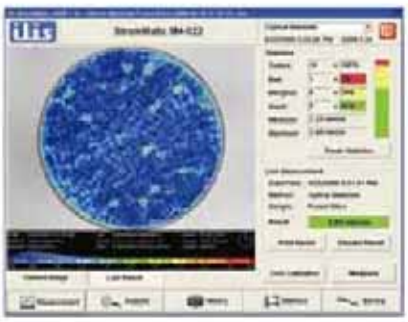
Optical Metrology for a Dynamic World

4D Technology is the leading manufacturer of Dynamic Interferometry products, providing accurate measurement of optical grade surfaces, even in the presence of vibration and air turbulence.

4D laser interferometers are used daily throughout the world in critical applications, from unique space-based projects to high throughput production. For optical testing, astronomy, satellite optics, and data storage, 4D is changing how and where interferometers are used.

Quality is measurable

The ilis gmbh with headquarters in Erlangen (Germany) develops, produces and distributes software solutions, measuring systems as well as automated test equipment for quality assurance in the glass and optical industry. With the measuring and testing equipment of the StrainMatic® series, the company develops imaging polarimeter systems for the automatic and objective measurement of stress birefringence in glass and plastics.



Wednesday-Thursday, 19-20 November 2008 • Proceedings of SPIE V. 7281

Large Mirror and Telescopes

Conference Chairs: **JIANG Wenhan**, Academician, Chinese Academy of Engineering (China)
Roland GEYL, REOSC Optics, SAGEM (France)
Myung K. Cho, National Optical Astronomy Observatory (USA)
WU Fan, Institute of Optics and Electronics, CAS (China)

Program Committee:
Jim Burge, University of Arizona(USA)
Bernard Delabre, ESO (Germany)
Eric RUCH, REOSC Optics, SAGEM (France)
Magomed A.Abdulkadyrov,Lytkarino Optical Glass Factory (Russia)
Matt Johns, Carnegie Observatories (USA)
Hans J. Kaercher, MAN Technologie AG (Germany)
YU Jingchi, Suzhou Univ. (China)
Sung-Kie Youn, Korea Advanced Institute of Science and Technology (KAIST) (Korea)
GAO Bilie, Nanjing Institute of Astronamical Optical Technology,CAS (China)

- Mirrors for large astronomical and space telescopes
- Light-weighted mirror technology
- Large deployable mirror and telescopes
- New and innovative mirror and telescope designs
- Advanced testing methods for large mirror
- Support systems and structures
- New material for large mirrors

WED, 19 November 2008

SESSION 1-1

25min/report; Room 1 ····· Wed. 13:30-17:10;

Chair:Wu Fan

- ✓ Four decades of ZERODUR® mirror substrates for astronomy
  Thorsten Döhring, Ralf Jedamzik, Thomas Westerhoff, Peter Hartmann(Germany) ····· [1-017]
- ✓ Study on the surface of large-aperture optical elements in frequency domain
  Shimeng Li, Rongzhu Zhang(China) ····· [1-009]
- ✓ A novel method of phasing segmented mirrors
  Qiudong Zhu, Shanshan Wang, Genrui Cao(China) ····· [1-042]
- ✓ Influence of optical surface error on scattering loss of optical mirror
  Dongliang Wu, Yifan Dai, Guilin Wang(China) ····· [1-006]

Tea Time (15:10-15:25)

- ✓ Control System for the Multi-motor Friction Drive of Large-scale Optical Telescope
  Mao Yao, Ma Jia-guang, Bao Qi-liang, YANG Song-hua(China) ····· [1-039]
- ✓ FEM analysis and experiment study of Ultra Thin Active Mirror
  NI Ying, Guo Pei-ji,Huang Qi-tai YU Jing-chi(China) ····· [1-007]
- ✓ Subaperture Stitching Interferometer for Large Optics
  Shengyue Zeng, Yifan Dai, Shanyong Chen(China) ····· [1-020]
- ✓ Figure analysis and adjustment of large aperture reflector
  Chen Xiao li, Ruan Ning Juan, Ma Jun,Su Yun(China) ····· [1-024]

THU, 20 November 2008

SESSION 1-2

25min/report; Room 1 ····· THU. 8:30-12:10;

Chair:Fan Bin

- ✓ Analysis deforming and moving feature, when using stressed lap on both convex and concave hyperboloids
  Gao Bilie, Wu Fan(China) ····· [1-018]
- ✓ Decoupling control for position error and surface error of segmented primary mirror
  Dong Bing, Yu Xin, Zhang Xiaofang, Wang Xiao(China) ····· [1-026]
- ✓ Optimizing attaching area in ultra-thin active mirror system
  Xie Bin, Ni Ying(China) ····· [1-043]
- ✓ Observer Based Higher Order Sliding Mode Control for Large Optical Astronomical Telescope
  Wangping Zhou, Xiaoling Ye, Wei Guo, Li Yu(China) ····· [1-032]

Tea Time (10:10-10:25)

- ✓ Acceleration feedback control for low velocity friction in servo control system
  Tao Tang, Yongmei Huang, Chengyu Fu, Jiaguang Ma(China) ····· [1-021]
- ✓ Aberration Analysis for Development of Large- Aperture Reflector by Finite element
  Yuanjing Penga, Lvjun Yuan(China) ····· [1-038]
- ✓ Analysis of piston error of optical sparse-aperture imaging system
  Juan Zhao, Dayong Wang, Yuhong Wan, Zhuqing Jiang, Shiquan Tao(China) ····· [1-033]
- ✓ Forward Kinematic Analysis on the Parallel Supporting Structure of Large Opto-electronic Equipments
  Cheng Gang, Ge Shi-Rong, Wan Yong-Jian(China) ····· [1-031]

POSTER

We will provide a broad with the dimentions of length of 2.5 metres and breadth of 1 metres for each post papers. Please prepare your post materials yourself.

WED. Nov. 20, 2008 13:00-14:00 Preparation 14:00-17:00 Opening Auditorium 1

Wednesday- Thursday, 19-20 November 2008 • Proceedings of SPIE V. 7282

Advanced Optical Manufacturing Technologies

Conference Chairs: **YANG Li**, COMT, COS (China)
John M. Schoen, Center for Optical Manufacturing, University of Rochester (USA)
Yoshiharu Namba, Chubu University (Japan)
LI Shengyi, NUDT(China)

Program Committee:
David D. Walker, University College Landon (U.K)
Mike DeMarco, QED Technologies (USA)
XIN Qiming, Beijing Institute of Technology (China)
James R.Torley, University of Colorado(USA)
YU Jingchi, Suzhou Univ. (China)
Masahide Katsuki, Toshiba Machine Co.Ltd (Japan)
Karen Scott, The Aerospace Corp (USA)
Gaven F.Chapmam, Moore Precision Tool (USA)
Richard Freeman, ZEEKO Ltd (UK)
Paul Shore, Cranfield University (UK)
Wenda Jiang, LPI Precision Optics Ltd.(Hong Kang)
HUI Changshun, Tianjin Jinhang Institute of Technology Physics (China)

- Advanced optical manufacturing technologies
- Aspherical optics design, manufacturing and testing
- ICF optical technology and engineering
- Super-precision optical manufacturing
- Optical thin film coatings
- Diamond turning technology
- Optical design and simulation software and tool
- Optoelectronics components and modules integration and manufacturing
- Opto-mechanical components and devices

WED, 19 November 2008

SESSION 2-1

20min/report; Room 2 ····· Wed. 13:30-17:10;

Chair: Wan Yongjian

- ✓ Direct Diamond Turning of Steel Molds for Optical Replication
  Fritz Klocke, Olaf Dambon, Benjamin Bulla, Michael Heselhaus(Germany) ····· [2-077]
- ✓ Double-swing method used for polishing off-axis aspherical mirrors
  Wang Peng, Li Jun-feng, Xuan Bin, Chen Xiao-ping, Song Shu-mei, Chen Ya(China) ····· [2-095]
- ✓ A mechanistic cutting force model for diamond fly-cutting of microstructured surface
  Qingliang Zhao, Bing Guo, Hui Yang, Xiaohu Zhang(China) ····· [2-171]
- ✓ Precision compression molding process of low Tg glass aspheric lenses
  Tao Ma, Jingchi Yu(China) ····· [2-044]
- ✓ Fabrication of Micro Glass Lens Mould by Using Ultra-Precision Micro-Grinding Process
  Yin Shaohui, Tang Kun, Zhu Yongjian, Chen Fengjun, Fan Yufeng, Guo Li(China) ····· [2-097]
- ✓ Study on calculation and application for asphericity of rectangle off-axis aspherics
  LI Jun-feng, XUAN Bin, WANG Peng, CHEN Xiao-ping, Zhang Hong,(China) ····· [2-089]

Tea Time (15:10-15:25)

- ✓ Polishing of Silicon Based Advanced Ceramics
  Fritz Klocke, Olaf Dambon, Richard Zunke, D. Waechter(Germany) ····· [2-080]
- ✓ A freeform turning lathe with direct drives and aerostatic bearing
  GUAN Chao-liang, DAI Yi-fan, YIN Zi-qiang, YANG Fan(China) ····· [2-037]
- ✓ Influence of slurry pH on material remove rate and surface roughness of super precision polishing of LBO crystal
  Jun Li*, Yongwei Zhu, Dunwen Zuo, Yong Zhu, Chuangtian Chen(China)····· [2-009]
- ✓ Point Spread Function Estimation based on àtrous Wavelet Transform
  Chen Bo, Geng Ze-xun, Peng Hong-gui,Yang Yang(China) ····· [2-117]
- ✓ Material removal rate based on edge effects in ultra precision polishing process
  Yang Wei, Guo YinBiao,Xu Qiao(China)····· [2-002]

THU, 20 November 2008

SESSION 2-2

20min/report; Room 2 ····· THU. 8:30-12:10;

Chair: Zhang Rongzhu

- ✓ GLASS AND SILICON FOILS FORMING FOR X-RAY SPACE TELESCOPES
  Martin Mika(Czech Republic) ····· [2-079]
- ✓ The Finite Element Simulation and Experimental Research in Cutting Forces of KDP Crystal
  Jinghe WANG*, Qingxin MENG, Hongxiang WANG, Shen DONG,Jian GUO(China)····· [2-177]
- ✓ Experimental investigation on the effect of abrasive grain size on the lapping uniformity of sapphire wafer
  Donghui Wen, Zhiwei Wang, Kehua Zhang(China) ····· [2-167]
- ✓ Study on the influence and disposal method of the micro-cracks of optical components
  CHEN Xiao-ping, XUAN Bin, WANG Peng, LI Jun-feng, SONG Shu-mei, Zhang Hong, XIE Jing-jiang(China)
  ····· [2-130]
- ✓ Experimental Investigation on Polishing of Ultra Smooth Surface in Nanoparticle Colloid Jet Machining
  Xiaozong Song, Yong Zhang, Feihu Zhang, Dianrong Luan(China) ····· [2-098]

Tea Time (10:10-10:25)

- ✓ Optical Design and Optimization of 350X Optical Zoom Lens with Diffractive Optical Element and Digital Signal Processing
  Yi-Chin Fang, Han-Ching Lin(Taiwan, China) ····· [2-081]
- ✓ Effects of velocity and pressure distributions on material removal rate in polishing process
  Yaguo Li, Jian Wang, Qaio Xu, Wei Yang, Yinbiao Guo(China) ····· [2-006]
- ✓ Development of ultra-precision three axes micro milling machine
  Peng Zhang*, Bo Wang, Yingchun Liang(China) ····· [2-137]
- ✓ Deterministical magnetorheological finishing of optical aspheric mirrors
  Song Ci, Dai Yifan, Peng Xiaoqiang, Li Shengyi, Shi Feng(China)····· [2-036]
- ✓ Image density property of the optical information recording microcapsule material
  Weidong lai, Xiaowei Li, Xinzheng Li, Guangsheng Fu(China)····· [2-143]

POSTER

We will provide a broad with the dimentions of length of 2.5 metres and breadth of 1 metres for each post papers. Please prepare your post materials yourself.

WED. Nov. 20, 2008 13:00-14:00 Preparation 14:00-17:00 Opening Auditorium 1

Wednesday-Thursday, 19-20 November 2008 • Proceedings of SPIE V. 7283

Optical Test and Measurement Technology and Equipments

Conference Chairs: **ZHANG Yudong, Director of Institute of Optics and Electronics,CAS (China)**
James C. Wyant, Director of Optical Sciences Center, Univ. of Arizona (USA)
Robert Smythe, ZYGO Corporation (USA)
Hexin Wang, Optical Technology Carl Zeiss AG (Germany)

Program Committee:
LI Jingzhen, Shenzhen University (China)
Jose M. Sasian,University Arizona(USA)
Tadashi Hatano,Tohoku University(Japan)
Mike Conroy, Taylor Hobson Limited (England)
SU Chaolian, Xi'an Institute of Technology (China
James R.Torley,University of Colorado(USA)
XU Qiao, Chengdu Fine Optical Engineering Research Center (China)
Peter C. Chen, The Catholic University (USA)
Mary G. Turner, InfoTek Information Systems (USA)
HAN Changyuan, Changchun Institute of Optics, Fine Mechanics and Physics, CAS (China)
Malacara-Doblado Daniel, Centro de Investigaciones en Optica, A. C.Mexico
ARAFA. H. ALY, Chonnam National University (Korea)
Sondes Trabelsi-Bauer, Karlsruhe Research Center (Germany)

- Modern interferometric technologies
- Test for aspherical optical surface
- Test for super- precision optical surface
- Measurement for super smooth surface
- Measurement of optical thin film
- Test with infrared technologies
- Optical contamination
- Optical test and measurement for nanometer technology
- New and innovative metrology and equipment
- Analysis and modeling tools and software

WED, 19 November 2008

SESSION 3-1

16min/report; Room 3 ····· Wed. 13:30-17:10;

Chair: Wu Shibin

- ✓ Calibration of rotary joints in multi-axis machine tool
  Abdul Wahid Khan, Fei Liu, Wuyi Chen (China) ····· [3-098]
- ✓ Development of a parallelism tester for visible and infrared compound system
  Jing Hongwei, Wu Shibin, Chen Qiang, Lei Boping, Jiang Jibin, Mei Ke(China) ····· [3-222]
- ✓ Micro Assembled Fourier Transform Spectrometer
  KONG Yan-mei, LIANG Jing-qiu , LIANG Zhong-zhu , WANG-Bo , ZHANG Jun (China) ····· [3-023]
- ✓ A non-null interferometric system for general aspheric testing
  Dong Liu, Yongying Yang, Chao Tian, Lin Wang and Yongmo Zhuo(China) ····· [3-029]
- ✓ Study on Data Processing and Experiment of Fabry-Perot Fiber Optic Strain Gauge
  Wang Hongjian, Lu Yu(China) ····· [3-078]
- ✓ Real-time Portable Dual Channel Image Fusion and Data Processing System
  Wang Lin, Yang Yong-ying, Wang Dao-dang, Liu Dong(China) ····· [3-082]

Tea Time (15:10-15:25)

- ✓ Pyroelectric Property of Novel LiTa3O8 Thin Film Prepared by Sol-Gel Methods
  De Yin ZHANG(China) ····· [3-134]
- ✓ Measurement of Phase Noise through Beat Frequency
  He Yao, Zhang Rongzhu(China) ····· [3-044]
- ✓ The alignment of off-axis asphere and compensator with four poles
  Xuan Bin, Chen Xiaoping, Wang Peng, Li Junfeng, Song Shumei,(China) ····· [3-112]
- ✓ Quantitative characterization of surpersmooth surface with roughness in the sub-nanometer range
  Zhengxiang Shen, Zhanshan Wang*, Bin Ma, Li Wang, Yiqin Ji, Huasong Liu(China) ····· [3-223]
- ✓ Tracking and detecting occupational diseases for teachers by using of infrared imaging method
  Shu-wang Chen, Sheng-biao An, Shu-hai Wang(China) ····· [3-137]
- ✓ The stabilizing of a multiplexed optical fiber interferometer system
  Fang Xie, Jia Jia, Chen Zhimin (China) ····· [3-203]

THU, 20 November 2008

SESSION 3-2

16min/report; Room 3 ····· THU. 8:30-12:10;

Chair: Jin Hongwei

- ✓ Dynamic Liquid Surface Shape Measurement
  XuHua WU,Lei CHEN,Zaihong TAO(China) ····· [3-019]
- ✓ Alignment Error Model of Subaperture Stitching Interferometry for Aspheric Surface Based on Wavefront Aberrations
  Wang Weibo, Tan Jiubin, Zhu Liming, Ge Zhenggui(China) ····· [3-032]
- ✓ Large dynamic range optical metrology with radial shearing interferometry
  Dahai Lia, Xiaoping Qi Yiping Cao Xin Zhou Qionghua Wang(China) ····· [3-114]
- ✓ Study on a reference detection of infrared thermograph with high precision
  Xu Yuan, Cao Maoyin, Xu Kebao(China) ····· [3-125]
- ✓ AGV trace sensing and processing technology based on RGB color sensor array
  Xu Kebao, Zhu Ping, Wang Juncheng, Yun Yuliang(China) ····· [3-206]
- ✓ Precise Measurement measurement of Ultrathick ultrathick Transparent transparent Oxide oxide Film film by Modified modified Ellipsometric ellipsometric Modelmodel
  Ming-Yu Sheng, Xiao-Wei Wu, Hong-Mei Zhang, Xin Jia, Yuan Zhao(China) ····· [3-175]

Tea Time (10:10-10:25)

- ✓ New method of annular sub-apertures stitching
  Su Yun, Wang Kai , Ruan Ningjuan , Li Bo(China) ····· [3-013]
- ✓ Study On Multi-sensor Optic-electrical System Performance Test
  Lou Ying (China) ····· [3-217]
- ✓ Squareness perpendicularity measuring techniques in multiaxis machine tools.
  Abdul Wahid Khan, Wuyi Chen (China) ····· [3-099]
- ✓ Phase Retrieval based Wavefront Sensing Experimental Implementation and Wavefront Sensing Accuracy Calibration
  Heng Mao, Xiao Wang, Dazun Zhao(China) ····· [3-173]
- ✓ An interpolation circuit with high resolution and high response speed
  Piao Weiying, Yuan Yibao, Xu Lianhu, Zhang Hao(China) ····· [3-001]
- ✓ Based on MDCE to simulate bell-shaped interferograms produced by a capillary tube interferometer
  Yang Ailing , Tang Mingming , Zhang Jinliang (China) ····· [3-145]

POSTER

We will provide a broad with the dimentions of length of 2.5 metres and breadth of 1 metres for each post papers. Please prepare your post materials yourself.

WED. Nov. 20, 2008 13:00-14:00 Preparation 14:00-17:00 Opening Auditorium 1

- ✓ New Method of Fiber Bragg Grating Demodulation Technique and Applied in Detection of Equipment
  Zhao Bing, Zhang Zhi-Li ,Zhong Qi-Yuan, Tu Hongliang, Tan Lilong(China) ····· [3-003]
- ✓ Three-beam coherent combination experiments based on segmented mirrors and measure of phase characteristics of beams passing through Yb-doped fiber amplifier
  Ping Yang, Ruo fu Yang, Feng Shen1, Mingwu Ao, Wenhan Jiang(China)····· [3-004]
- ✓ Development of Photoelectric Pulse Laser Range Finding System
  Tan Boxue, Wang Shuyun, Li Tianze, Wen Fang(China)····· [3-005]
- ✓ Development of real-time photoelectric measurment on geometric size of objects
  Yuan Guangming, Li Tianze(China)····· [3-006]
- ✓ Study on Surface Topography of IBS Oxide Multilayer Mirrors
  Chen Yong, Zhang Xiao, Shan Fan, Chen Boxiong(China)····· [3-007]
- ✓ Conjugate gradient optimum algorithm Study of Non-linear Correction for One -Dimension PSD
  Mo Changtao, Du Xin, Zhang Li-li, Wang Ming (China)····· [3-009]
- ✓ Performance analysis of temperature and strain simultaneous measurement system based on coherent detection of Brillouin scattering
  LiJuan Zhao, YongQian Li, and JiSheng Zhang(China)····· [3-011]
- ✓ Effect of threshold value on high reflectivity measurement with optical feedback cavity ring-down technique
  Yuan Gong, Yanling Han, and Bincheng Li (China)····· [3-012]
- ✓ Interfaces Roughness Cross Correlation Properties and Light Scattering of Optical Thin Films
  PAN Yong-qiang, WU Zhen-sen, HANG Ling-xia(China) ····· [3-014]
- ✓ Quantitative measurement of optical surfaces using an improved Knife Edge
  Jing Hongwei,Yang Wei,Fan Bin,Wu Shibin,Wu Fan,Fan Tianquan(China) ····· [3-015]
- ✓ Research on the large glass stress distributing measurement
  Yang Wei, Jing Hongwei, Wu Shibing, Cao Xuedong(China) ····· [3-016]
- ✓ The Model and simulation for testing two-mirror optical system by subaperture stitching interferometry
  Wang Lihua, Wu Shibin, Hou Xi, Kuang Long,Cao Xuedong(China) ····· [3-018]
- ✓ Development of a Bubble Tester
  Yang Wenzhi,Jing Hongwei,Wu Shibin,Cao Xuedong(China)····· [3-020]
- ✓ Resolution performance of the Extreme Ultraviolet Telescope
  GAO Liang, YANG Lin, LI De-Sheng, NI Qi-Liang, LIANG Jing-Qiu, CHEN Bo (China)····· [3-021]
- ✓ Study on Portable Optical 3D Coordinate Measuring System
  Ren Tongqun, Zhu Jigui, Guo Yinbiao(China)····· [3-022]
- ✓ Large Field F-θ Laser Scanning System
  Baozhong SHAN, Baoping GUO, Hanben NIU(China) ····· [3-024]
- ✓ Dynamic detection technology for the irregularity state of railway track based on the linear array CCD
  Peng Jian-ping, Wang li, Gao xiao-rong, Wang ze-yong, Zhao quan-ke(China) ····· [3-025]
- ✓ Design of 3D measurement system based on multi-sensor data fusion technique
  Zhang Weiguang, Han Jun, Yu Xun(China)····· [3-026]
- ✓ Ultra-precise Micro-motion Stage for Optical Scanning Test
  CHEN Wen, ZHANG Jianhuan, JIANG Nan(China)····· [3-033]
- ✓ Wavefront analysis for an aberrated Gaussian beam with Fresnel diffraction theory
  Mingqiang Liu, Bincheng Li, Yanru Wang,and Honggang Hao(China) ····· [3-035]
- ✓ Study of Photoacoustic Imaging based on DSPI
  Zhenheng LIN, Xizhao LU, Chun LIN, Ruifang YE,Yuanqing HUANG(China) ····· [3-036]
- ✓ Dynamic deformation measurement based on Inverse Projected Fringe Technique
  Wen Li, Qican Zhang , Yuankun Liu(China) ····· [3-037]
- ✓ Research on Hartmann Test for Progressive Addition Lenses
  QIN Lin-ling YU Jing-chi(China) ····· [3-038]
- ✓ Distortion measurement and calibration technology research of automatic observing and aiming optical system based on CCD
  Yu Xuna, Li Qian ,Shang Xiao-yan, Nie Liang ,Wu Ji-an (China)····· [3-039]
- ✓ Study on Control Structure Analysis and Optimization of High-precision Measurement Platform for Optical Aspheric Surface
  Ke Xiaolong, Guo Yinbiao, Wang Zhenzhong, Liu Jianchun(China) ····· [3-040]

Wednesday-Thursday, 19-20 November 2008 • Proceedings of SPIE V.7284

Design, Manufacturing and Testing of Micro and Nano Optical Devices and Systems

Conference Chairs: **Sen Han, Veeco, Inc. (USA)**
Jos Benschop, System Engineering and Research, ASML (Netherland)
Edgar Bader, Lithographic Optics Division, Carl Zeiss SMT AG(Germany)
Masaomi Kameyama, Nikon Corporation (Japan)
LUO Xiangang, Institute of Optics and Electronics, CAS (China)
LI Yanqiu, Beijing Institute of Tedchnology (China)

Program Committee:
WANG Xiangchao, Shanghai Institute of Optics and Fine Mechanic, CAS (China)
LI Zhihong, MEMS Center, Beijing University (China)
Li-Anne Liew, National Institute of Science and Technology (USA)
Ming Liu, Institute of Microelectronics, CAS (China)
YaoLi, Centre for Composite Materials, Harbin institute of technology (China)
Tadashi Hatano,Tohoku University(Japan)
Zhichun Ma, Michigan Aerospace Corp. (USA)
LI Xiaoping, Shanghai Micro Electronic EquipMment Co Ltd (China)
Sung Moon, Korean Institute of Science and Technology (Korea)
ZHAO Qingliang, Harbin institute of technology (China)
FANG Fengzhou, Tianjing University (China)

- Micro-nano optical system design
- Micro-nano Optical manufacturing and testing
- Nano metrology technology and tools
- Nanoscale imaging and sensing technologies
- Nanofluidics device design, fabrication and testing
- Fabrication of MEMS/MOEMS devices
- Testing and Characterization of MEMS/MOEMS
- MEMS/MOEMS reliability
- Packaging of MEMS/MOEMS devices
- Next generation lithography
- EUVL research and development
- Advances in thin film coating for MEMS Microfluidics, BioMEMS, and Medical Microsystems

WED, 19 November 2008

SESSION 4-1

25min/report; Room 4 ····· Wed. 13:30-17:10;

Chair: Luo Xiangang

- ✓ Precision Testing of Advanced MEMS Devices
  Sen Han, Erik Novak and Nelson Blewett(USA) ····· [4-073]
- ✓ The field of view of the sub-wavelength metallic lens
  Shaoyun Yin, Hongtao Gao,Xiaochun dong, Chunlei Du(China) ····· [4-034]
- ✓ Characterizations of the displaying of magnetic-fluid microelectromechanical light modulator with laser speckle technique
  Xijun Wang, Desheng Li, Yajun Wang, Shaochang Su, Jook Wooh Seo(China) ····· [4-007]
- ✓ A New Method on Real-time Signal Correction and Subdivision for Grating-based Nanometrology
  Fang Cheng, Ye-Tai Fei , Kuang-Chao Fan(China) ····· [4-011]

Tea Time (15:10-15:25)

- ✓ Diamond Turning Microstructure Optical Components
  Wenda Jiang(Hong Kong, China) ····· [4-047]
- ✓ Light manipulation beyond wavelength and its applications
  Changtao Wang, Luo Xiangang(China) ····· [4-072]
- ✓ Analysis and compensation of shape distortion in UV-LIGA based on partial coherent light theory
  Mujun Li, Lianguan Shen, Jinjin Zheng, Wei Zhao(China) ····· [4-027]
- ✓ Micro-machined infrared emitter with metallic photonic crystals structure
  Fangqiang Li, Haisheng San, Meiying Cheng, Xuyuan Chen(China) ····· [4-005]

THU, 20 November 2008

SESSION 4-2

25min/report; Room 4 ····· THU. 8:30-12:10;

Chair: Yao Jun

- ✓ Artificially structured material with low refractive index
  Luo Xiangang, Zhao Zheyu, Qiu Chuankai(China) ····· [4-071]
- ✓ Highly Reflective Optical Coatings from Vacuum Ultraviolet to Near Infrared for Micro Mirrors
  Minghong Yang, Ciming Zhou, Desheng Jiang(China) ····· [4-022]
- ✓ Drive concepts for next generation motion systems for EUV Lithography tooling
  Frank Gehbauer(Germany) ····· [4-069]
- ✓ FDM Study of Ion Exchange Diffusion Equation in Glass
  Zigang ZHOU, Yongjia YANG, Qiang WANG and Guangchun SUN(China) ····· [4-048]

Tea Time (10:10-10:25)

- ✓ MEMS Testing and Applications in Automotive and Aerospace Industries
  Zhichun Ma, Xuyuan Chen(USA) ····· [4-063]
- ✓ A Static Micro-Michelson Interferometer Based on Electro-Optical Effect
  He Xiaojuna, Jin Guang, Liang Jingqiu(China) ····· [4-023]
- ✓ TiO2 nanocrystals fabricated by hydrothermal method
  FU Sanling, LIU Shuhua(China) ····· [4-004]
- ✓ Study on laser direct writing system for 32nm node
  Wenbo Jiang, Song Hu, Yong Yang,Lixin Zhao,Wei Yan,Shaolin Zhou,Wangfu Chen(China) ····· [4-002]

POSTER

We will provide a broad with the dimentions of length of 2.5 metres and breadth of 1 metres for each post papers. Please prepare your post materials yourself.

WED. Nov. 20, 2008 13:00-14:00 Preparation 14:00-17:00 Opening Auditorium 1

1-003	Poster	2-025	Poster	2-096	Poster	2-158	Poster
1-004	Poster	2-026	Poster	2-097	Session2-1	2-159	Poster
1-006	Session1-1	2-027	Poster	2-098	Session2-2	2-160	Poster
1-007	Session1-1	2-028	Poster	2-099	Poster	2-161	Poster
1-009	Session1-1	2-029	Poster	2-100	Poster	2-162	Poster
1-010	Poster	2-030	Poster	2-101	Poster	2-163	Poster
1-012	Poster	2-031	Poster	2-102	Poster	2-164	Poster
1-013	Poster	2-034	Poster	2-103	Poster	2-165	Poster
1-014	Poster	2-035	Poster	2-104	Poster	2-166	Poster
1-017	Session1-1	2-036	Session2-2	2-105	Poster	2-167	Session2-2
1-018	Session1-2	2-037	Session2-1	2-106	Poster	2-168	Poster
1-019	Poster	2-038	Poster	2-107	Poster	2-169	Poster
1-020	Session1-1	2-039	Poster	2-108	Poster	2-170	Poster
1-021	Session1-2	2-042	Poster	2-109	Poster	2-171	Session2-1
1-022	Poster	2-043	Poster	2-110	Poster	2-172	Poster
1-023	Poster	2-044	Session2-1	2-111	Poster	2-173	Poster
1-024	Session1-1	2-046	Poster	2-112	Poster	2-174	Poster
1-025	Poster	2-047	Poster	2-113	Poster	2-175	Poster
1-026	Session1-2	2-049	Poster	2-114	Poster	2-176	Poster
1-027	Poster	2-050	Poster	2-115	Poster	2-177	Session2-2
1-028	Poster	2-052	Poster	2-116	Poster	2-178	Poster
1-029	Poster	2-053	Poster	2-117	Session2-1	2-179	Poster
1-030	Poster	2-054	Poster	2-118	Poster	2-180	Poster
1-031	Session1-2	2-055	Poster	2-119	Poster	2-181	Poster
1-032	Session1-2	2-056	Poster	2-120	Poster	2-183	Poster
1-033	Session1-2	2-057	Poster	2-121	Poster	2-184	Poster
1-034	Poster	2-058	Poster	2-122	Poster	2-185	Poster
1-036	Poster	2-059	Poster	2-123	Poster	3-001	Session3-2
1-038	Session1-2	2-060	Poster	2-124	Poster	3-002	Poster
1-039	Session1-1	2-061	Poster	2-126	Poster	3-003	Poster
1-040	Poster	2-062	Poster	2-127	Poster	3-004	Poster
1-041	Poster	2-063	Poster	2-128	Poster	3-005	Poster
1-042	Session1-1	2-064	Poster	2-129	Poster	3-006	Poster
1-043	Session1-2	2-065	Poster	2-130	Session2-2	3-007	Poster
1-044	Poster	2-066	Poster	2-131	Poster	3-009	Poster
2-002	Session2-1	2-067	Poster	2-132	Poster	3-011	Poster
2-003	Poster	2-070	Poster	2-133	Poster	3-012	Poster
2-004	Poster	2-071	Poster	2-134	Poster	3-013	Session3-2
2-005	Poster	2-072	Poster	2-135	Poster	3-014	Poster
2-006	Session2-2	2-073	Poster	2-136	Poster	3-015	Poster
2-007	Poster	2-074	Poster	2-137	Session2-2	3-016	Poster
2-008	Poster	2-077	Session2-1	2-140	Poster	3-018	Poster
2-009	Session2-1	2-079	Session2-2	2-141	Poster	3-019	Session3-2
2-010	Poster	2-080	Session2-1	2-142	Poster	3-020	Poster
2-011	Poster	2-081	Session2-2	2-143	Session2-2	3-021	Poster
2-012	Poster	2-082	Poster	2-146	Poster	3-022	Poster
2-014	Poster	2-083	Poster	2-147	Poster	3-023	Session3-1
2-015	Poster	2-084	Poster	2-148	Poster	3-024	Poster
2-016	Poster	2-085	Poster	2-149	Poster	3-025	Poster
2-017	Poster	2-087	Poster	2-150	Poster	3-026	Poster
2-018	Poster	2-088	Poster	2-151	Poster	3-029	Session3-1
2-019	Poster	2-089	Session2-1	2-152	Poster	3-032	Session3-2
2-020	Poster	2-091	Poster	2-153	Poster	3-033	Poster
2-021	Poster	2-092	Poster	2-154	Poster	3-035	Poster
2-022	Poster	2-093	Poster	2-155	Poster	3-036	Poster
2-023	Poster	2-094	Poster	2-156	Poster	3-037	Poster
2-024	Poster	2-095	Session2-1	2-157	Poster	3-038	Poster

Symposium Location

Chengdu Wang Jiang Hotel 5☆

We take pleasure in informing you that the venue for the symposium AOMATT08 has been adjusted to Chengdu Wang Jiang Hotel from the Tibet Hotel Chengdu, we believe that every attendee will enjoy the change much more when you arrive in the conference. The hotel reservation you have made early are still effective, you don't need to make a new reservation. Wang Jiang Hotel with the room style, room rate and room number you ordered will keep no change.

Wang Jiang Hotel is the only five-star hotel sited in a great garden in Chengdu. It is located in eastern area of the well-known historical city Chengdu,5km to centre city, 20km away from the airport and 9km from the railway station. It covered an area of over 200mu where hundreds of flowers and trees are planted. The everlasting green trees, colorful flowers, singing birds, booths and waterside pavilions and the running water are all combined with top-grade villas among them. WangJiang Hotel is featured in unique traditional buildings of Western Sichuan with advanced modern facilities, perfect accessories and individualized earnest service. It is a combination of top large-scale restaurant, entertainment, accommodation, meeting, traveling, relaxation and an ideal place for high-grade amenity activities.

WangJiang Hotel assembled modern high-tech and hearty service that make guests feel easy at home. There are totally 417 rooms which would allow over 700 people to be served at the same time. There are more than twenty different types of meeting rooms with the capacity from 24 to 500 persons. All rooms are luxuriously equipped with central air-conditioner, broad band internet access, telephone, satellite TV, fridge, electronic safety deposit box, network locker, automatic smoke alarm and water spray, etc.

It is acceptable of credit card include American Express, Master, Visa, DinersCard, JCB, Great Wall. MuDan, etc..





望江宾馆位置及行车路线图

酒店交通

距机场约16公里，车程约25分钟，出租车费用约60元，巴士费用约10元

距火车站约10公里，车程约15分钟，出租车费用约20元，巴士费用约2元

距市中心天府广场5公里，车程约5分钟，出租车费用约10元，巴士费用约2元

Overseas Visitors Airport Picking up

Authors from outside of the mainland will be picked up at ShuangLiu Airport (Chengdu) by Conference Organization.

Please take me to the Wang Jiang Hotel, Thank you.

请送我到成都望江宾馆，谢谢。

Oral and Poster Presentation

For Oral Presentation, we will provide a computer to release the paper with the format of PPT (Microsoft PowerPoint).
For Poster presentation, we will provide a bulletin board in an individual room to release the paper.

Currency Exchange

In China, only RMB is used. However, exchange centers can be found at airports, most hotels and large shopping centers. When exchanging money, please keep your receipt by which you can change any remaining RMB back to foreign currency when leaving China. Visa, Master, American Express, Diners Club, JCB, and other credit cards are accepted in many department stores and hotels. But it might be difficult to draw cash with credit cards. The Bank of China and most hotels can cash travelers cheques issued by and foreign bank or financial institution. Traveler's cheque signed over to a third party cannot be cashed in China, but can be presented for collection through for the Bank of China.

Travel Information

Chengdu is one of the three best citys(Chengdu, Hangzhou, Dalian) for traveling in China, capital of Sichuan province, is not only China's important industrial base, but also a well-known historical and cultural city in southwest China, with a history of 2,500 years. In the vicinity of the city, there are a 2000- year -old water conservancy project, Dujiangyan Irrigation System, a Taoist mountain called Qingcheng Shan (Green-city mountain). In addition, about 160 kilometers away from Chengdu lies the largest Buddha statue Leshan Grand Buddha and a Buddhist sacred mountain, Mt. Emei. All the historical sites and scenic spots are well worth a visit, not to say, the tea houses, the local cuisine and the traditional arts and crafts.
Chengdu is the main gateway to Tibet; there are daily flights to the Potala Palace at Lhasa, When the word Tibet is mentioned something icy chils the readers' nerves. In fact it snows only once or twice in a year and owing to the perpetuity of bright sunshine. Tristar piles the ruins is a distance 5000 to 3000 about ancient SiChuan cultural remains site, the area amounts to 12 square kilometers now, is Chinese one of 20th century significant archaeology discoveries. The world famous Base of Panda is home to panda. The historical sites of Temple of San Su is well worth a visit.
Located south of Chengdu, Jiuzhaigou Valley which is fantastic fairyland belongs to carbonate barrier lake landform with high mountains and deep valleys. There are nine old Tibetan villages in the gorge, hence the name Jiuzhaigou Valley.

Dujiangyan

Leshan Giant Buddha

the Base of Panda

Cultural Relic of Tristar Piles

望江宾馆位置及行车路线图

酒店交通

距机场约16公里，车程约25分钟，出租车费用约60元，巴士费用约10元

距火车站约10公里，车程约15分钟，出租车费用约20元，巴士费用约2元

距市中心天府广场5公里，车程约5分钟，出租车费用约10元，巴士费用约2元

成都望江宾馆总平面图
The Plan of WangJiang Hotel