

CLEO[®] / Pacific Rim 2003

The 5th Pacific Rim Conference on Lasers and Electro-Optics

第五屆環太平洋雷射與光電研討會

December 15-19, 2003
The Grand Hotel, Taipei, Taiwan



Photonics Lights Innovation

From nano-structures and devices
to systems and networks

Program

Organized by:

- Graduate Institute of Electro-Optical Engineering, National Taiwan University 台灣大學光電所
- Taiwan Optical Engineering Society 台灣光學工程學會

Message from the CLEO/PR 2003 Organizer

Welcome to Taipei. Mid-December is a pleasant season in Taipei. We expect a very successful conference.

The Fifth Pacific Rim Conference on Lasers and Electro-Optics (CLEO/PR 2003) has experienced a longer organization time than others due to the SARS epidemic in April through June 2003. This conference has been postponed from July to December. With the postponement, we have accepted the second-run paper submissions and the replacements of the accepted papers for updating the contents. The total contributed paper submissions amount to 710 with about 650 papers accepted for presentation. Among them, around 60 % of papers are presented orally and the other 40 % are presented with posters. Including the plenary, tutorial, and invited papers, the total presentation number at CLEO/PR 2003 is around 770.

Regarding the topics covered by CLEO/PR 2003, besides the conventional technical areas, we add several new fields, which represent either new frontiers of photonics technologies or important research issues in the Asia and Pacific Regions. They include *Optoelectronic Device and Optical System Modeling*, *Optical Micro-Electro-Mechanical Systems*, *Photonic Crystals and Nano-Optics Structures*, and *Display and Lighting Devices*. Also, we have three special sessions on *Development of Solid-State Lighting*, *Semiconductor Quantum Dots and Applications*, and *Development of High-Field Lasers and Ultra-Short Wavelength Radiation*. For linking the technology development and application market, CLEO/PR 2003 includes an Industrial Forum, focusing the issue on *Solid State Lighting Technology and Market Trends*. We would appreciate the efforts of all the technical area co-chairs and sub-committee members.

This conference has been financially sponsored by many local government units, universities, research institutions, and private companies. We would take this opportunity to express our sincere gratitude for their supports.

C. C. Yang

Organizer and the Technical Program Chair of CLEO/PR 2003

CLEO/PR 2003 is organized by
Graduate Institute of Electro-Optical Engineering,
National Taiwan University;
Taiwan Optical Engineering Society.

Sponsored by:

National Science Council;
Ministry of Education;
Taipei City Government;
Graduate Institute of Electro-Optical Engineering,
National Taiwan University;
Center for Information and Electronics Technologies,
National Taiwan University;
Center for Nano Science and Technology,
National Taiwan University;
Southern Taiwan Opto-electronics Center of Excellence,
National Sun Yat-Sen University;
Institute of Electro-Optical Engineering,
National Chiao Tung University;
Institute of Optical Sciences, National Central University;
Institute of Atomic and Molecular Science, Academia Sinica;
Opto-Electronics & Systems Laboratories,
Industrial Technology Research Institute;
International Program Center,
Industrial Technology Research Institute;
AOARD/AFOSR and AFOFE, USA;
RiTdisplay Corporation;
Hamamatsu Photonics K. K.;
Chunghwa Telecom Laboratories

Co-sponsored by:

Optical Society of America;
IEEE/Lasers and Electro-Optics Society;
Japan Society of Applied Physics;
Institute of Electronics, Information and Communication Engineers -
Electronics Society/Communication Society, Japan;
Optical Society of Korea;
Australian Optical Society;
Hong Kong Optoelectronics Association.

TABLE OF CONTENTS

Message from the CLEO/PR 2003 Organizer	II
Foreword	IV
Conference Agenda	IV
Topics	V
Plenary Sessions	VII
Tutorial Lectures & Invited Talks	VIII
Industrial Forum	XI
Conference Committees	XI
The Grand Hotel (Conference Site) – Floor Plan	XIV
Agenda of Sessions -- Tuesday, December 16, 2003	XVI
-- Wednesday, December 17, 2003	XVIII
-- Thursday, December 18, 2003	XX
-- Friday, December 19, 2003	XXII
Program	
-- Tuesday, December 16, 2003	1
-- Wednesday, December 17, 2003	17
-- Thursday, December 18, 2003	51
-- Friday, December 19, 2003	85
Author Index	

LIST OF TABLE TOP EXHIBITORS

- RiTdisplay Corporation
 銖寶科技股份有限公司
- HAMAMATSU PHOTONICS K. K.
- ONSET ELECTRO-OPTICS CO., LTD.
 銓州光電股份有限公司
- AIXTRON AG
- COLLIMAGE INTERNATIONAL CO., LTD.
 宗豪科技股份有限公司
- Unice E-O Services Inc.
 宏惠光電股份有限公司
- Newport Corporation, Taiwan Branch
 美商理寶股份有限公司台灣分公司
- TAYHWA TECHNOLOGY CO., LTD.
 泰華科技有限公司
- Kintech Corporation
 金達科技股份有限公司
- Springer-Verlag GmbH & Co. KG
- SEPERBIN COMPANY, LTD.
 上儀有限公司
- CREATIVE STARS ELECTRO OPTICS CO., LTD.
 匠星光電儀器企業股份有限公司

FOREWORD

The Fifth Pacific Rim Conference on Lasers and Electro-Optics (CLEO/PR 2003) was originally scheduled on July 22 - 26, 2003, at Taipei, Taiwan. Because of the SARS epidemic in Taiwan, this conference has been postponed till December 15 - 19, 2003. The purpose of the Conference is to review the state-of-the-art of lasers and electro-optics from basic science and device research to engineering systems and applications. The conference also intends to cross-fertilize with other fields including multimedia, environmental control, and biomedical systems. The Conference is open to relevant professionals from academia, industry, and government.

The CLEO/PR is part of the CLEO Conference series, which has been running annually since 1981 in North America. The rapid expansion of these front-edge science/technology activities to a global scale necessitated a start of the new Conference Series in the Pacific Rim and European regions. The first, second and fourth CLEO/PR were held in 1995, 1997 and 2001, at Makuhari Messe, Japan, and the third CLEO/PR was held in 1999 at Seoul, Korea, all with great success.

CLEO/PR 2003 is organized by the Graduate Institute of Electro-Optical Engineering/National Taiwan University and the Taiwan Optical Engineering Society. It is sponsored by the National Science Council, the Ministry of Education, the Taipei City Government, the Graduate Institute of Electro-Optical Engineering/National Taiwan University, Center for Information and Electronics Technologies/National Taiwan University, Center for Nano Science and Technology/National Taiwan University, Southern Taiwan Opto-electronics Center of Excellence/National Sun Yat-Sen University, the Institute of Electro-Optical Engineering/National Chiao Tung University, the Institute of Optical Sciences/National Central University, the Institute of Atomic and Molecular Sciences/Academia Sinica, Opto-Electronics & Systems Laboratories/Industrial Technology Research Institute, the International Program Center/Industrial Technology Research Institute, AOARD/AFOSR/USA, AFOFE/USA, and several private companies. This conference is co-sponsored by the Optical Society of America, IEEE/Lasers and Electro-Optics Society, the Photonics Industry & Technology Development Association, the Japan Society of Applied Physics, the Institute of Electronics, Information and Communication Engineers/Electronics Society & Communication Society/Japan, the Optical Society of Korea, the Australian Optical Society, and the Hong Kong Optoelectronics Association.

CONFERENCE AGENDA

2003	December 15 (Monday)	December 16 (Tuesday)	December 17 (Wednesday)	December 18 (Thursday)	December 19 (Friday)
Registration	16:00 – 19:00	07:30 – 18:00	08:00 – 18:00	08:00 – 18:00	08:00 – 10:00
Plenary Sessions		09:00 – 12:30			
Oral Sessions		14:00 – 15:30 16:00 – 18:00	08:30 – 10:00 10:30 – 12:30 16:00 – 18:00	08:30 – 10:00 10:30 – 12:30 16:00 – 18:00	08:30 – 10:00 10:30 – 12:30
Table Top Exhibit		12:00 – 18:00	08:30 – 18:00	08:30 – 18:00	08:30 – 12:00
Conference Reception		18:30 – 20:00			
Poster Sessions			13:30 – 15:30	13:30 – 15:30	
Industrial Forum			14:30 – 15:30 16:00 – 18:30		
Conference Banquet			18:30 – 20:00		

TOPICS

1. Gas, Liquid and Solid-State Lasers

Laser science and engineering fundamentals, measurements, design, and applications
Short wavelength lasers VUV and XUV laser sources
Advances in gas, liquid, and solid-state laser media
Demonstration of novel pump sources including high-power laser diodes
Up-conversion lasers, amplitude and frequency stability
Novel resonator geometries
Modeling of gas, liquid, and solid-state lasers/resonators

2. Semiconductor Materials, Lasers and Related Devices

Semiconductor material growth and process
Semiconductor lasers from UV to FIR wavelength range
Semiconductor microcavity lasers (VCSELs, Microdisk LDs, Photonic crystal LDs)
Multi-wavelength-array and wavelength-tunable lasers
Semiconductor optical amplifiers
Quantum-well, wire, and dot structures for lasers/optical amplifiers
Photonic integration with semiconductor lasers/optical amplifiers
Applications of semiconductor lasers/optical amplifiers

3. High-Field Lasers and Ultra-Short Wavelength Radiation

Physics and technology of high peak power lasers
Extreme optics with high-intensity ultrashort-pulse lasers
Phase control and measurements of intense laser fields
Strong-field interactions with atoms, molecules and solids
Propagation of intense fs pulses in optical media and applications
Coherent XUV/X-ray sources and applications
Novel ultrashort wavelength radiation sources and applications
Laser-based high-energy physics and nuclear fusion

4. Quantum Optics, Laser Spectroscopy and Their Applications

Symposia in this area focus on the development of laser spectroscopic techniques and their applications in the study of structure and dynamics of molecular systems. Emphasis will be on the utility of the coherence, high intensity, and fast time-resolution afforded by the lasers for the study and even control of molecular processes in gases, at interfaces and in complex systems. Interested topics include:

- Coherent control of chemical reactions
- High optical field induced processes in molecules
- Ultrafast probe of chemical reactions
- Nonlinear optical spectroscopy of molecules at interfaces
- Ultrafast processes on surfaces and at interfaces
- Novel development in laser spectroscopy
- Time and Spatially resolved spectroscopy
- Applications in complex systems: interfacial, condensed phase, and biological

5. Nonlinear Optics

Fundamental nonlinear optics
Nonlinear spectroscopy for material and device studies
Nonlinear dynamics: solitons, instabilities, chaos, etc.
Phase conjugation
Nonlinear optics in fibers
Frequency conversion and optical parametric oscillators
Quasi phase matching devices and applications
Nonlinear optical device applications

6. Ultra-Fast Phenomena and Optoelectronics

Generation, propagation and detection of ultrashort pulses
Physics and measurements of ultrafast optical phenomena and electronic properties of materials and devices
Ultrahigh-speed optoelectronic/parametric devices and

switching techniques

7. Optical Material and Fabrication Techniques

Crystal growth
Photorefractive materials
Materials with enhanced nonlinear optical response
Materials for high-power and nonlinear propagation
Semiconductor materials
Nano-fabrication techniques, including lithography, deposition, and self-organization
Quantum well, wire, and dot fabrication techniques
Novel processing for optical devices

8. Fiber Optics, Micro-Optics, Integrated and Guided-Wave Optics

Optical fiber materials and components, active and passive
Micro-optic components
Optical waveguide devices, switches, modulators, and filters
Waveguide device design and fabrication
Integrated-optic devices
Integration and packaging techniques

9. Optical Switching, Computing, Information Processing and Storage

Optical computing architectures and algorithms
Photonic switching networks and systems
Optical and optoelectronic computing systems
Optical interconnections
Optical signal processing
Photonic functional devices for switching and computing
Optical components and materials for switching and computing
Applications of optics in computing
Short-wavelength lasers
Near-field optical data storage
DVD technologies
Drive technology

Optical heads and components
Rewritable optical media
Partial-ROM media
High density recording

10. Laser Metrology and Environmental Optics

Optical interferometry and polarimetry
Fiber optic / guided-wave sensors
Sensor networking and distributed sensing
Near field optical sensing
Optical sensing devices
Ranging and tracking
Optical remote sensing
Atmospheric, space, and underwater optical systems
Environmental monitoring

11. Laser Chemistry, Materials Processing and Industrial Applications

Fundamental aspects of laser-material interaction, including diagnostics and modeling
Laser modification such as annealing, doping, mixing, texturing, and cleaning
Laser-induced chemistry, including lithography, etching, CVD, and desorption
Laser ablation and pulsed laser deposition
Laser micromachining and rapid prototyping
Novel (fs, VUV, hybrid) laser processing
Laser welding, drilling, cutting and marking
Laser applications in production lines
Laser systems and optics for materials processing

12. Medical and Biological Applications

Therapeutic laser applications (surgery, ophthalmology, ENT, dermatology, urology, obstetrics and gynecology, dentistry, cardiovascular, diseases, cosmetic treatment)
Biomedical optics including tissue optics, spectroscopy, imaging, etc.
Optical coherence tomography
Photon migration and diffuse photon image.
Diagnostic optical spectroscopy and image (laser induced fluorescence, Raman spectroscopy, laser

doppler velocimeter, etc.)
Microscopy and optical contrast agent, confocal, multi-photon, second and third harmonic microscopy.
Special fiber and fiber optical delivery systems for clinic applications
Optical sensing, device engineering and instrumentation for medicine, biophysics and bioelectronics

13. Lightwave Communications and Networks

WDM transmission systems
High speed transmission systems
System impact of dispersion and nonlinear effects
Photonic networks
Data/optical layer internetworking
Photonic switching and routing
Optical access systems
Microwave photonics
Testbed and field trials

14. Optoelectronic Device and Optical System Modeling

Analytical and numerical techniques for optoelectronics modeling
Modeling active, passive, and non-linear devices
Modeling waveguides and waveguide components
Modeling photonic nanostructures and microstructures
Modeling optical fiber transmission systems
Modeling optical fiber system components, e.g., transmitters, receivers, and amplifiers
New techniques for modeling optical fiber transmission systems
Modeling light propagation in novel optical fibers, e.g., spun fibers and holey fibers

15. Optical Micro-Electro-Mechanical Systems

Micro- and nano-fabrication technologies
Modeling and simulation
Novel device integration
Optical sensors and actuators
Scanning and display technologies
Components and sub-systems for telecom applications
Micro-instrumentation

Biomedical applications
Optical MEMS packaging and interconnection

16. Photonic Crystals and Nano-Optics Structures

Photonic crystals and fabrication
Optical circuits by photonic crystals
Optical cavities employing photonic bandgap structures
Nonlinear phenomena in periodic structures
Nonperturbative exciton-cavity coupling in a semiconductor microcavity
Linear and nonlinear spectroscopy of nanostructures, single atoms and molecules
Near-field optics for high density optical storage and fabrication
Nanocavities
Nano-fabrication, including lithography and deposition
Coupled nanosystems
Optics with subwavelength resolution and structure
Near-field optics in biology and chemistry
Industrial applications

17. Display and Lighting Devices

Flat panel display devices and physics
New liquid crystal modes
Plasma displays
Silicon based microdisplays
Organic and polymeric LED for display and lighting applications
Field emission devices for displays and lighting applications
High power LED.

SS1. Development of Solid-State Lighting

SS2. Semiconductor Quantum Dots and Applications

SS3. Development of High-Field Lasers and Ultra-Short Wavelength Radiation

PLENARY SESSIONS

1. “Physics, Economics, and Innovation: Building the Next Generation Optical Network”

Tingye Li, retired from AT&T Labs-Research, USA



Mini-biography: Tingye Li retired from AT&T in December 1998 after a 41-year research career at Bell Labs and AT&T labs in microwaves, lasers, and optical communications. His early work on laser resonator modes is fundamental to the theory and practice of lasers. Since the late 1960s, he has been engaged in pioneering research in lightwave technologies. As Head of

the Lightwave Systems Research Department he led the work on amplified WDM transmission and advocated its deployment for upgrading network capacity. He was deeply involved in the “concurrent R&D” effort in AT&T on WDM systems from 1988 until his retirement. He is a fellow of OSA, IEEE, AAAS, IEC, and PSC, and is a member of NAE, the Chinese Academy of Engineering and the Academia Sinica. He has received many awards and honors, among which are the IEEE 1975 W. R. G. Baker Prize, the IEEE 1979 David Sarnoff Award, the OSA/IEEE 1995 John Tyndall award, the OSA 1997 Frederic Ives Medal/Jarus Quinn Endowment, and the AT&T 1997 Science and Technology Medal. He was named an honorary professor in many universities in China and was President of OSA in 1995.

Description: Technological innovations are the underpinnings of engineering advances. As a major technological innovation, lightwave communications has led to revolutionary changes in telecommunications, ranging from the network infrastructure and operation, to the management and economics of supplying bandwidth. Recent advances in optical fiber amplifiers made WDM transmission economically viable, by creating “virtual fibers” for massive capacity upgrades that can meet the large traffic demand of the Internet. Furthermore, optical networking can offer potential cost savings in network management and operation, as well as in service provisioning. Innovating for the next-generation optical network will require not only fundamental knowledge of the physical principles of components and systems, but also understanding of the economic tradeoffs of alternative systems and architectures. This talk will examine some of the technological advances that promise economic advantages for the next-generation optical networks, not only regarding capital costs, but also operational expenditures.

2. “Quantum Dots for Lasers, Amplifiers and Computing”

Dieter H. Bimberg, Technical University of Berlin, Germany



Mini-biography: Dieter Bimberg was born in Schrozberg, Germany, on July 10, 1942. He received the Diploma in physics and the Ph.D. degree from Goethe University, Frankfurt, in 1968 and 1971, respectively. From 1972 to 1979 he held a Principal Scientist position at the Max Planck-Institute for Solid State Research inc and Stuttgart. In 1979 he was appointed as Professor at

the Department of Electrical Engineering, Technical University of Aachen. Since 1981 he holds the Chair of Applied Solid State Physics at Technical University of Berlin. Since he 1990 Executive Director of the Solid State Physics Institute at the Technical University of Berlin, Berlin, Germany with a faculty of and a staff of 150. Since 1994 he is chairman of the National Research Council “Center of Excellence” on “Growth Related Properties of Nanostructures” and since 1998 of the national “Center of Competence” on “Nano-Optoelectronics” of the German Federal Ministry of Research. Amongst others he hold guest professorships at the University of California in Santa Barbara and at Hewlett-Packard in Palo Alto/Ca. His honors include the ranspar Oyo Buturi prize of Applied Physics, a honorary membership at the A.F.Ioffe Institute at St.Petersburg and the Russian State Prize in Science and Technology 2001. He has authored more than 800 papers, patents, and books. His research interests include the physics of nanostructures and nanostructured devices, like quantum dot lasers, and amplifiers, wide gap semiconductor heterostructures and high speed photonic devices.

Description: Universal self transparency on surfaces of semiconductors was discovered by us to lead to the formation of quantum dots. Their electronic and optical properties are closer to those of atoms than of solids.

QD-based edge and surface emitting lasers are superior to classical lasers eg by showing ultralow transparency currents or zero beam filamentation. First such QD lasers were created by us in 1993. Amplifiers based on QDs show gain recovery times as short as 70 fs, much faster than QW-based ones, indicating the potential of QDs for a completely novel class of SOAs with large commercial importance for MANs. The phase relaxation time of such QDs was discovered by us to be close to 1 ns, making such structures usefull for quantum computing and cryptography.

3. “The Photonic Crystal Fiber Revolution”

Philip Russell, University of Bath, UK



Mini-biography: Philip Russell is Professor in the Department of Physics at the University of Bath, where he heads the Optoelectronics Group. Previously he worked in universities and research laboratories across Europe and in the USA. He has 25 years experience (and over 300 publications) in many aspects of photonics and has helped pioneer a number of developments in fibre gratings, photonic band gap materials, acousto-optic fibre devices, nonlinear optics and periodically poled materials.

He is the founding chair of the Optical Society of America's Topical Meeting Series on Bragg Gratings, Photosensitivity and Poling in Glass. He is a Fellow of the Optical Society of America and in 2000 won its Joseph Fraunhofer Award/Robert M. Burley Prize for his invention of photonic crystal (“holey”) fibre. In 2002 he won the Applied Optics Division Prize of the Institute of Physics. His work on photonic crystals (both in films and fibres) is recognised by a continuing series of plenary, keynote and invited talks at conferences and summer schools all over the world.

Description: Photonic crystal fibers (PCFs – sometimes also known as “holey” or “microstructured” fibers) have been the focus of increasing scientific and technological interest since the first working example was produced in late 1995. Although superficially similar to a conventional optical fiber, PCF has a unique microstructure, consisting of an array of microscopic holes (or channels) that runs along the entire length of the fiber. These holes act as optical barriers or scatterers, which suitably arranged can “corral” light within a central core (either hollow or made of solid glass). The holes can range in diameter from ~25 nm to ~50 nm. Although most PCF is formed in pure silica glass, it has also recently been made using polymers and non-silica glasses, where it is difficult to find compatible core and cladding materials suitable for conventional total internal reflection guidance. PCF supports two guidance mechanisms: total internal reflection, in which case the core must have a higher average refractive index than the holey cladding; and a two-dimensional photonic bandgap, when the index of the core is uncritical – it can be hollow or filled with material. Light can be controlled and transformed in these fibers with unprecedented freedom, allowing for example the guiding of light in a hollow core, the creation of highly nonlinear solid cores with anomalous dispersion in the visible and the design of fibers that support only one transverse spatial mode at all wavelengths. Applications are emerging in many diverse areas of science and technology. For example, as first shown by Ranka et al, an ultra-small core fibre made from solid glass and surrounded by very large air-holes can be arranged to have a zero chromatic dispersion wavelength in the 800 nm Ti:sapphire band. This fibre produces spectacular spectral broadening of high repetition rate 100 fsec pulses, with a brightness some 10,000× brighter than the sun and a similar bandwidth. This source is transforming the fields of optical coherence tomography, spectroscopy and frequency metrology. In its hollow core form, PCF also solves a key long-standing challenge in photonics, for which there is no good conventional solution: How to force light to interact – strongly, reproducibly and over long path-lengths – with low-density materials such as gases, vapours and liquids. This is an exciting development with major implications for numerous gas-based nonlinear optical and laser devices. Recently a hydrogen Raman cell was demonstrated with a threshold energy of 800 nJ – some 100× lower than previously reported. In September 2002, breakthrough losses of 0.58 dB/km for solid-core PCF, and 13 dB/km for hollow-core PCF, were reported by respectively by teams at BlazePhotonics and Corning. These two examples illustrate how the PCF concept is ushering in a new and more versatile era of fibre optics, with a multitude of different applications spanning many areas of science and technology.

TUTORIAL LECTURES & INVITED TALKS

1. Gas, Liquid and Solid-State Lasers

- Stuart Jackson, University of Sydney, Australia [Tutorial Lecture]
(TH1I, Thursday 08:30-09:30 December 18)
“Developments in High-Power Fibre Lasers”
- Takatomo Sasaki and Masashi Yoshimura, Osaka University, Japan
(TH2I, Thursday 10:30-11:00 December 18)
“Recent advancement on UV light generation by nonlinear optical borate crystals in Osaka University”
- Daniel Brown, Cymer, Inc., USA
(TH4I, Thursday 16:00-16:30 December 18)
“Excimer laser characteristics for deep-UV photolithography”
- Jesper Munch, The University of Adelaide, Australia
(F2I, Friday 10:30-11:00 December 19)
“CW high-power ultra-stable solid-state lasers”

2. Semiconductor Materials, Lasers and Related Devices

- M. Troccoli, Harvard University, USA
(TU3B, Tuesday 14:00-14:30 December 16)
“Mid-IR quantum cascade lasers and amplifiers: recent developments and applications”
- Jens Buus, Gayton Photonics Ltd, UK [Tutorial Lecture]
(TU4B, Tuesday 16:00-16:30 December 16)
“Wavelength tunable semiconductor lasers”
- Nobuhiko Nishiyama, Corning Inc., USA
(W2B, Wednesday 10:30-11:00 December 17)
“High Efficiency CW Operation of 1.53 μm Vertical Cavity Surface Emitting Laser on InP”
- S. C. Wang, National Chiao Tung University, Taiwan
(W4B, Wednesday 16:00-16:30 December 17)
“Progress in GaN based blue and ultraviolet light emitting devices”
- Hisaki Kato, TOYODA GOSEI CO., LTD., Japan
(W4B, Wednesday 17:00-17:30 December 17)
“GaN based white LED”
- Yoshihiko Ikenaga and Akihiko Kasukawa, The Furukawa Electric Co., Ltd., Japan
(TH2J, Thursday 10:30-11:00 December 18)
“1.3 μm -range GaInNAsSb VCSELs with high temperature operation”
- K. Nakahara and T. Yuasa*, Hitachi Ltd., *OpNext Japan, Inc., Japan
(TH2J, Thursday 11:00-11:30 December 18)
“1.3- μm InGaAlAs WTR-MQW-DFB lasers for 10-Gbit/s SR applications”

3. High-Field Lasers and Ultra-Short Wavelength Radiation

- S. L. Chin, Laval University, Canada
(W1D, Wednesday 08:30-09:00 December 17)
“Self-focusing and filamentation of ultrafast laser pulses in optical media: physics and applications”

- F. Krausz and M. Uiberacker, TU Wien, Austria & MPQ, Germany
(W2D, Wednesday 10:30-11:00 December 17)
“Ultrafast metrology at the atomic time scale”
- K. Midorikawa, RIKEN, Japan
(W2D, Wednesday 11:00-11:30 December 17)
“Generation and Application of Strong Fields in the XUV Region”
- Y. Izawa and R. Kodama, Osaka University, Japan
(W4D, Wednesday 16:00-16:30 December 17)
“Fast ignitor research by PW laser”
- J. Zhang, Institute of Physics, China
(W4D, Wednesday 16:30-17:00 December 17)
“Research on high field laser physics at the Institute of Physics, CAS”

4. Quantum Optics, Laser Spectroscopy and Their Applications

- Yuichi Fujimura, Tohoku University, Japan
(TH1G, Thursday 08:30-09:00 December 18)
“Quantum Control of Molecular Chirality”
- Jason R. Dwyer and Dwayne Miller, University of Toronto, Canada
(TH2G, Thursday 10:30-11:00 December 18)
“Making Movies of Molecules with Femtosecond Electron Wavepackets”
- Hrvoje Petek, University of Pittsburgh, USA
(TH2G, Thursday 11:30-12:00 December 18)
“The fundamental response of Si to 50 THz bandwidth optical excitation”
- Y. Ron Shen, University of California, USA [Tutorial Lecture]
(TH4G, Thursday 16:00-17:00 December 18)
“Surface Nonlinear Optical Spectroscopy”
- Oleg A. Aktsipetrov, Moscow State University, Russia
(TH4G, Thursday 17:00-17:30 December 18)
“Nonlinear optical probing low-dimensional ferroelectricity and magnetism in surface structures and ultra-thin films”
- Kenji Ohmori, Institute for Molecular Science, Japan
(F2G, Friday 10:30-11:00 December 19)
“Sub-10 attosecond manipulation of quantum phases”
- Jie Zhang, Chinese Academy of Science, China
(F2G, Friday 11:30-12:00 December 19)
“Temporal and spatial characteristics of high energy electrons generated by high laser field”

5. Nonlinear Optics

- Wolfgang Sohler, University of Paderborn, Germany
(TU3F, Tuesday 14:00-14:30 December 16)
“All-Optical Signal Processing in Periodically Poled Ti:LiNbO₃ Channel Guides”
- Kyungwon An, Seoul National University, Korea
(W1F, Wednesday 08:30-09:00 December 17)

- “Quantum Chaos in Deformed Microcavities”*
Choon Sup Yoon, KAIST, Korea
(W2F, Wednesday 10:30-11:00 December 17)
“Intrinsic Pulsewidth Dependence of Third-Order Nonlinear Optical Susceptibility”
- Kazuhiro Imai, The Institute of Physical and Chemical Research, Japan
(W4F, Wednesday 16:00-16:30 December 17)
“Widely tunable Terahertz-wave parametric generator with achromatic injection-seeding”
- Yujie J. Ding, Lehigh University, USA
(W4F, Wednesday 17:45-18:15 December 17)
“Coherent THz waves based on difference-frequency generation”
- Jim Piper, Macquarie University, Australia
(TH2F, Thursday 10:30-11:00 December 18)
“Design and Operation of Solid-State Raman Lasers”

6. Ultra-Fast Phenomena and Optoelectronics

- Masataka Nakazawa, Tohoku University, Japan
(TU3G, Tuesday 14:00-14:30 December 16)
“Ultrafast optical pulses and solitons for advanced communications”
- Osamu Wada, Kobe University, Japan
(TU4G, Tuesday 16:00-16:30 December 16)
“Femtosecond photonic devices using nano-structure materials for ultrafast optical communications”
- Takayoshi Kobayashi, University of Tokyo, Japan
(W1G, Wednesday 08:30-09:00 December 17)
“Ultrashort visible pulse generation by NOPA”
- Irina Sorokina, Institut für Photonik, TU Wien, Austria
(W1G, Wednesday 09:00-09:30 December 17)
“Diode-pumped self-starting few optical cycle pulse generation at 1.5 μm ”
- Xun Gu and Rick Trebino, Georgia Institute of Technology, USA [Tutorial Lecture]
(W2G, Wednesday 10:30-11:30 December 17)
“The Measurement of Ultrashort Pulses: From Simple Laser Pulses to Unstable, Ultracomplex, Ultrabroadband, Ultraweak Light Pulses”
- X.-C. Zhang, Rensselaer Polytechnic Institute, USA [Tutorial Lecture]
(W4G, Wednesday 16:00-17:00 December 17)
“Recent Progress of Terahertz Wave Tomographic Imaging”
- Chi-Kuang Sun, National Taiwan University, Taiwan
(TH1D, Thursday 08:30-09:00 December 18)
“THz MSM traveling-wave photodetectors for communications and imaging”

7. Optical Material and Fabrication Techniques

- L. Isaenko, Russian Academy of Sciences, Russia
(TH2H, Thursday 10:30-11:00 December 18)
“*Single crystals with low phonon energy for mid-IR lasers*”
- Y. Y. Zhu, Nanjing University, China
(TH2H, Thursday 12:00-12:30 December 18)
“*Polariton in a piezoelectric superlattice*”
- K. Kitamura, National Institute for Materials Science, Japan
(TH4H, Thursday 16:00-16:30 December 18)
“*Micro-structuring of lithium niobate crystal based on domain engineering*”
- T. Fukuda, Tohoku University, Japan
(F1H, Friday 08:30-09:00 December 19)
“*Growth of ZnO Single Crystal by Hydrothermal Method using Pt Container and its Application to the Growth of GaN by Amonothermal Method*”
- C. T. Chen, Chinese Academy of Sciences, China
(F2H, Friday 10:30-11:00 December 19)
“*Recent Advances of Deep and Vacuum-UV Harmonic Generation with New Borate Crystals*”

8. Fiber Optics, Micro-Optics, Integrated and Guided-Wave Optics

- S. Chu, Little Optics, USA
(TU3I, Tuesday 14:00-14:30 December 16)
“*Application of microring resonators in large scale photonics integrated circuits*”
- S. Namiki, The Furukawa Electric Co., Ltd., Japan
(W2I, Wednesday 10:30-11:00 December 17)
“*Optical fiber amplifiers for WDM*”
- Y. J. (Ray) Chen, University of Maryland Baltimore County, USA
(W4J, Wednesday 16:00-16:30 December 17)
“*Incoherent Interferometric measurement technique for PLC devices*”
- Y. Hibino, NTT Photonics Laboratories, Japan
(TH2A, Thursday 10:30-11:00 December 18)
“*Recent advances in AWG technologies*”
- J. J. He and E. Koteles, Lightip Technologies Inc., Canada
(TH4A, Thursday 16:00-16:30 December 18)
“*InP-based Photonic Integrated Circuits*”
- B. Y. Kim, Korean Advanced Institute of Science and Technology, Korea
(F1A, Friday 08:30-09:00 December 19)
“*Dynamic Gain Equalizers for WDM Systems*”

9. Optical Switching, Computing, Information Processing and Storage

- Francis Yu, Pennsylvania State University, USA
(TU3H, Tuesday 14:00-14:30 December 16)
“*Holography: Origin, Development and Beyond*”
- Yao Li, Alliance Fiber Optic Products, USA
(TU4H, Tuesday 17:45-18:15 December 16)

- “*WDM Fiber Optic Component Trends for Power, Wavelength, and Configuration Management*”
- Yoshimasa Kawata, Shizuoka University, Japan
(W1H, Wednesday 08:30-09:00 December 17)
“*Multilayered optical memory with a nanofabricated recording medium in three-dimensions*”
- ByoungHo Lee, Seoul National University, Korea
(W2H, Wednesday 10:30-11:00 December 17)
“*Three-dimensional image recognition and display using lens arrays*”
- T C Poon, Virginia Tech, USA
(W2H, Wednesday 12:00-12:30 December 17)
“*Real-time joint transform correlation using optical heterodyning*”
- Hideyoshi Horimai, OPTWARE Corporation, Japan
(W4H, Wednesday 16:00-16:30 December 17)
“*Collinear Holography*”
- Suganda Jutamulia, Newtonics, USA
(W4H, Wednesday 17:30-18:00 December 17)
“*Miniature lens for correcting elliptical and astigmatic laser diode beam as applied to optical storage and communications*”
- Jun Tanida, Osaka University, Japan
(TH1H, Thursday 08:30-09:00 December 18)
“*Optoelectronic hybridization for compact imaging system*”

10. Laser Metrology and Environmental Optics

- Kaoru Minoshima, AIST, Japan
(TH1B, Thursday 08:30-09:00 December 18)
“*Femtosecond-comb distance meter: ultrahigh-resolution distance measurement using a mode-locked laser*”
- Chien Chou, National Yang-Ming University, Taiwan
(TH2D, Thursday 11:00-11:30 December 18)
“*Optical Heterodyne Interferometer on Optical Activity Measurement*”
- Takao Kobayashi, Fukui University, Japan [Tutorial Lecture]
(TH4D, Thursday 17:00-18:00 December 18)
“*Progress in high-spectral resolution lidars for remote sensing of the environment*”
- Jae Yong Lee, Korea Research Institute of Standards and Science, Korea
(F1D, Friday 08:30-09:00 December 19)
“*Recent progress in cavity ringdown spectroscopy for ultrasensitive detection and quantitative measurement*”
- Thomas J. Kulp, Sandia National Laboratories, USA
(F1D, Friday 09:30-10:00 December 19)
“*Infrared active imaging for the remote detection of fugitive gas emissions*”
- Chikao Nagasawa, Tokyo Metropolitan University, Japan
(F2D, Friday 10:30-11:00 December 19)
“*Lidar techniques for observations of atmospheric wind and temperature Profiles*”

11. Laser Chemistry, Materials Processing and Industrial Applications

- M. H. Hong, Laser Microprocessing, Data Storage Institute, Singapore
(TH4J, Thursday 16:00-16:30 December 18)
“*Laser Micro- & nanoprocessing of glass substrates*”
- Jianrong Qiu, Photon Craft Project, JST, Japan
(F1F, Friday 08:30-09:00 December 19)
“*Femtosecond Laser induced microstructures with photonic functions*”
- Wilhelm Pflöging, Forschungszentrum Karlsruhe GmbH, Germany
(F2F, Friday 10:30-11:00 December 19)
“*Fabrication of functional polymeric prototypes for micro-fluidic and micro-optical applications*”
- Masayuki Okoshi, National Defense Academy, Japan
(F2F, Friday 11:15-11:45 December 19)
“*F2 laser processing of silicone*”

12. Medical and Biological Applications

- Z. P. Chen, University of California at Irvine, USA [Tutorial Lecture]
(W1E, Wednesday 08:30-09:15 December 17)
“*Optical coherence tomography: technology and application*”
- D. D. Sampson, The University of Western Australia, Australia
(W2E, Wednesday 10:30-11:00 December 17)
“*The frequency-domain delay line in optical coherence tomography: design, capabilities and limitations*”
- C. C. Yang, National Taiwan University, Taiwan
(W2E, Wednesday 11:00-11:30 December 17)
“*High-resolution optical coherence tomography and its dispersion compensation*”
- Satoshi Kawata, Osaka University, Japan
(W4E, Wednesday 16:00-16:30 December 17)
“*Nano-imaging of biomolecules with near-field Raman microscope*”
- Min Gu, Swinburne University of Technology, Australia
(W4E, Wednesday 16:30-17:00 December 17)
“*Recent development of fiber-optic two-photon fluorescence endoscopy devices*”
- L. Wang, Texas A&M University, USA
(TH1E, Thursday 08:30-09:00 December 18)
“*Functional biophotonic imaging with ultrasonic mediation*”
- Peter So, MIT, USA
(TH1E, Thursday 09:00-09:30 December 18)
“*Multi-Photon Tissue Microscopy & Microanalysis*”
- Jianan Qu, Hong Kong University of Science and Technology, Hong Kong, China
(TH1E, Thursday 09:30-10:00 December 18)
“*Calibrated fluorescence imaging of tissue pathology in vivo*”
- Yukio Yamada, University of Electro-Communications, Japan
(TH2E, Thursday 10:30-11:00 December 18)
“*Photon Migration in Biological Tissue and Application to*”

Diffuse Optical Tomography
Wei R. Chen, University of Central Oklahoma, USA
(F1E, Friday 08:30-09:00 December 19)
“Selective laser-tissue interaction and immunological stimulation in cancer treatment”
Arthur Chiou, National Yang Ming University, Taiwan
(F1E, Friday 09:00-09:30 December 19)
“Current Trend and Recent Progresses in Optical Trapping: From Optical Tweezers to Single-Particle Spectroscopy and Photonics Force Microscopy”

13. Lightwave Communications and Networks

Thomas C-J. Chae, University of Melbourne, Australia
(W1J, Wednesday 08:30-09:00 December 17)
“Broadband Access Using EPON and Other Techniques”
Jianjun Yu and Gee-Kung Chang, Georgia Institute of Technology, USA
(W2A, Wednesday 10:30-11:00 December 17)
“Spectral Efficient DWDM Optical Label Generation and Transport for Next Generation Internet”
Jean-Pierre Goedgebuer, Georgia Institute of Technology Lorraine, France
(W2A, Wednesday 12:00-12:30 December 17)
“Chaotic State Optical Communications”
A. Gladisch, T-Systems, Deutsche Telekom, Germany
(W4A, Wednesday 16:00-16:30 December 17)
“Transparent Optical Networking: Application Scenarios”
Ronald Skoog and Ann VonLehmen, Telcordia Technologies, USA
(W4A, Wednesday 17:30-18:00 December 17)
“Architecture for Next Generation Optical Networks”
K. Kitayama, Osaka University, Japan
(TH1A, Thursday 08:30-09:00 December 18)
“Opical Code Correlation-based Processing : A Potential Technology for Photonic Networking”

14. Optoelectronic Device and Optical System Modeling

Curtis R. Menyuk, University of Maryland, USA [Tutorial Lecture]
(TU4A, Tuesday 16:00-17:00 December 16)
“Accurate calculation of bit error ratios in optical fiber communications systems”
Werner Rosenkranz, University of Kiel, Germany
(TU4A, Tuesday 17:00-17:30 December 16)
“Modeling and Performance Evaluation of Improved Data Formats for Optical Communications”
Chien-Jen (Simon) Chen, Onetta Inc., USA
(W2J, Wednesday 10:30-11:00 December 17)
“Modeling and Control of Er-Doped Fiber Amplifiers and Raman Optical Amplifiers”
Masanori Koshiba, Hokkaido University, Japan
(W4C, Wednesday 16:00-16:30 December 17)
“Finite Element Analysis of Photonic Crystal Fibers”

John Love, Australian National University, Australia
(TH4C, Thursday 16:00-16:30 December 18)
“Novel Adiabatic and Grating-based Devices for WDM Wavelength Add/Drop Applications”

15. Optical Micro-Electro-Mechanical Systems

Ming Wu, UCLA, USA
(TU4I, Tuesday 16:00-16:30 December 16)
“Applications of MEMS in Nano-Photonic Integrated Circuits”
Renshi Sawada, NTT Microsystem Integration Laboratories, Japan
(W1I, Wednesday 09:00-09:30 December 17)
“3D-MirrorArray with Terraced Electrodes and High Aspect Ratio Springs”

16. Photonic Crystals and Nano-Optics Structures

Eli Yablonovitch, UCLA, USA [Tutorial Lecture]
(TU3C, Tuesday 14:00-15:00 December 16)
“Photonic Crystals - New Materials for 21st Century”
Thomas F. Krauss, University of St. Andrews, UK
(TU4C, Tuesday 16:00-16:30 December 16)
“Photonic crystal WDM components”
Susumu Noda, Kyoto University, Japan
(TU4C, Tuesday 16:30-17:00 December 16)
“Manipulation of Photons by Artificial Defects in Photonic Crystals”
Vahid Sandoghdar, ETH Zurich, Switzerland
(W1C, Wednesday 08:30-09:00 December 17)
“Optical near-field microscopy of photonic crystals”
Masaya Notomi, NTT, Japan
(W2C, Wednesday 10:30-11:00 December 17)
“Lasing Action in Organic Photonic Crystal and Quasicrystal”
Yasuo Ohtera and Shojiro Kawakami, Tohoku University, Japan
(TH2C, Thursday 10:30-11:00 December 18)
“Functional Optical Components Consisting of Heterostructured Photonic Crystals”
J. G. Fleming, Sandia National Laboratory, USA
(TH2C, Thursday 11:00-11:30 December 18)
“Photonic Lattices Fabrication Using Si Lithographic Processes”
D. S. Kim, Seoul National University, Korea
(F1C, Friday 08:30-09:00 December 19)
“Plasmonic photonic crystals: theory and experiment”

17. Display and Lighting Devices

H. S. Kwok, The Hong Kong University of Science & Technology, Hong Kong, China
(TH4E, Thursday 16:00-16:30 December 18)
“Bistable Liquid Crystal Displays”
ByoungHo Lee, Seoul National University, Korea
(TH4E, Thursday 16:30-17:00 December 18)
“Design and analysis of gratings and diffractive optical elements for displays”

G. E. Jabbour and N. Peyghambarian, University of Arizona, USA
(F2C, Friday 10:30-11:00 December 19)
“Printing of Nanothick Organic Layers For Photonic and Photovoltaic Devices”
Taehyoung Zyung, ETRI, Korea
(F2C, Friday 11:00-11:30 December 19)
“White organic light-emitting diodes operated by organic field-effect transistors”

SS1. Development of Solid-State Lighting

T. Takebe, Sumitomo Electric, Japan
(TU3E, Tuesday 14:00-14:30 December 16)
“ZnSe-based White LED”
V. Haerle, OSRAM Opto Semiconductor, Germany
(TU4E, Tuesday 16:00-16:30 December 16)
“GaN LEDs for Solid-state Lighting”
J. T. Hsu, OES of ITRI, Taiwan
(TU4E, Tuesday 16:30-17:00 December 16)
“New approach of efficiency enhancement on GaN LED devices”

SS2. Semiconductor Quantum Dots and Applications

D. Huffaker, University of New Mexico, USA
(TH2B, Thursday 10:30-11:00 December 18)
“Progress in MOCVD grown quantum dot lasers”
G. Solomon, Stanford University, USA
(TH2B, Thursday 11:00-11:30 December 18)
“Spontaneous Emission Properties Of Position-Controlled Quantum Dots in Microdisk Cavities”
Y. Toda, Hokkaido University, Japan
(TH2B, Thursday 11:30-12:00 December 18)
“Optical characterization of strong carrier-phonon interactions in single quantum dots”
E. Yoon, Seoul National University, Korea
(TH2B, Thursday 12:00-12:30 December 18)
“Growth and optical properties of GaN-based quantum dots”
Y. Arakawa, University of Tokyo, Japan [Tutorial Lecture]
(TH4B, Thursday 16:00-17:00 December 18)
“Growth and physics of quantum dots for optoelectronics applications”

SS3. Development of High-Field Lasers and Ultra-Short Wavelength Radiation

Philip Balcou, ENSTA, France
(TU3D, Tuesday 14:00-14:30 December 16)
“Recent advances in high-intensity laser-matter interaction at LOA (France)”
J. Wang, Institute of Atomic & Molecular Physics, Academia Sinica, Taiwan
(TU3D, Tuesday 14:30-15:00 December 16)
“Development of multi-terawatt laser technology and applications in Taiwan”

C. P. J. Barty, Lawrence Livermore National Laboratory, USA
(TU3D, Tuesday 15:00-15:30 December 16)
“High energy petawatt laser development at the Lawrence Livermore National Laboratory”
C. H. Nam, Korea Advanced Institute of Science and Technology, Korea
(TU4D, Tuesday 16:00-16:30 December 16)

“Generation and applications of high harmonic x-ray sources at KAIST”
R. Sauerbrey, Friedrich-Schiller University of Jena, Germany
(TU4D, Tuesday 16:30-17:00 December 16)
“Relativistic Femtosecond Laser Plasmas”
H. Daido, Advanced Photon Research Center, JAERI, Japan
(TU4D, Tuesday 17:00-17:30 December 16)

“Strong-field science and technology at APRC, JAERI”
Z. Z. Xu, R. Li, and Z. Zhang, Shanghai Institute of Optics and Fine mechanics, China
(TU4D, Tuesday 17:30-18:00 December 16)
“High-field laser physics research at SIOM”

INDUSTRIAL FORUM

Time: December 17, 2003 (afternoon)

Chair: Dr. Yung S. Liu, Fellow & VP, Industrial Technology Research Institute and General Director, Optoelectronics & Systems Labs, Hsinchu, Taiwan

Discussion Topic: Solid State Lighting Technology and Market Trends

The rapid development of Taiwan’s optoelectronic industry in recent years has been remarkable. The industry sectors of optical storage, display, imaging and optoelectronic components in Taiwan are among the top producers in the world. In this CLEO/PR 2003 Industry Forum, we will have an overview of Taiwan’s optoelectronic industry in general and in particular the emerging technology using solid state light sources for general illumination and lighting applications will be discussed in detail. Especially, its market potential, technologic trends and future development direction will be assessed by leading experts in the fields.

Invited Speakers:

- ♦ Yung S. Liu, Ph.D, General Director, Opto-Electronics & Systems Laboratories, ITRI, Taiwan
- ♦ M. George Craford, Ph.D., Chief Technology Officer, Lumileds Lighting, LLC, USA
- ♦ Ian Ferguson, Professor, Georgia Institute of Technology, USA
- ♦ Volker Haerle, PG.D., Osram, Germany
- ♦ Michael Heuken, Vice President, Corporate Research & Development, Aixtron AG, Germany
- ♦ Jagdish H. D. Rebello, Ph.D, Industry Analyst, iSuppli Market Intelligence

Agenda:

Time	Title of the talk	Invited Speaker
14:30 ~ 15:00	Overview of the Optoelectronics Industry in Taiwan	Yung S. Liu
15:00 ~ 15:30	LED Technology : Status, Trends and the Requirements for Solid State Lighting	M. George Craford
15:30 ~ 16:00	Coffee/Tea Break	
16:00 ~ 16:30	The Technical Hurdles to the Implementation of Solid State Lighting in General Illumination	Ian T. Ferguson
16:30 ~ 17:00	Solid State Light : Solution and Realization	Volker Haerle
17:00 ~ 17:30	On Future Equipment and Related Manufacturing Issues	Michael Heuken
17:30 ~ 18:00	Market Overview on LEDs	Jagdish H. D. Rebello
18:00 ~ 18:30	Q & A	Yung S. Liu

CONFERENCE COMMITTEES

Steering Committee

Chair: K. Ueda, University of Electro-Communications, Japan
Members: K. Kikuchi, University of Tokyo, Japan
F. Koyama, Tokyo Institute of Technology, Japan
C. H. Lee, Kyung Hee University, Korea
J. H. Lee, Seoul National University, Korea

Y. S. Liu, Industrial Technology Research Institute, Taiwan
T. A. Nirmalathas, University of Melbourne, Australia
Y. Yamamoto, Stanford University, USA
C. C. Yang, National Taiwan University, Taiwan
Y. Yoshikuni, NTT Photonics Labs., Japan

Secretary: K. Apter, Optical Society of America, USA

International Advisory Committee

Co-Chairs: E. Lean, Industrial Technology Research Institute, Taiwan
T. P. Lee, Sarnoff Inc., USA

Members: K. Baldwin, Australian National University, Australia
S. Chi, National Chiao Tung University, Taiwan
S. J. Chua, Singapore-MIT Alliance, Singapore

E. P. Ippen, Massachusetts Institute of Technology, USA
T. Kamiya, National Institution for Academic Degrees, Japan
Y. Kato, Japan Atomic Energy Research Institute, Japan
D. Lau, Hong Kong Optoelectronics Asso., Hong Kong, China
C. H. Lee, Kyung Hee University, Korea
E. H. Lee, Inha University, Korea
J. H. Lee, Seoul National University, Korea
J. Love, Australian National University, Australia
B. Luther-Davies, Australian National University, Australia
R. M De La Rue, The University of Glasgow, UK
K. Nugent, University of Melbourne, Australia
E. Pun, The City University of Hong Kong, Hong Kong, China
G. I. Stegeman, University of Central Florida, USA
K. Tada, Yokohama National University, Japan
C. S. Tsai, Academia Sinica, Taiwan

Organizing Committee

Co-Chairs: T. Y. Chang, National Sun Yat-Sen University, Taiwan
Y. S. Liu, Industrial Technology Research Institute, Taiwan
Members: H. C. Chang, National Taiwan University, Taiwan
Y. Chang, RiTdisplay Corporation, Taiwan
S. Chao, National Tsing Hua University, Taiwan
I. L. Cheng, Walsin Lihwa Corp., Taiwan
W. H. Cheng, National Sun Yat-Sen University, Taiwan
J. Y. Chi, Industrial Technology Research Institute, Taiwan
A. Chiou, National Dong Hua University, Taiwan
J. I. Chyi, National Central University, Taiwan
M. T. Chu, Taiwan Optical Engineering Society, Taiwan
D. R. Huang, Industrial Technology Research Institute, Taiwan
H. L. Huang, National Tsing Hua University, Taiwan
H. P. Huang, Ritek Corp., Taiwan
C. C. Hsu, National Chung Cheng University, Taiwan
A. Kung, Academia Sinica, Taiwan
C. T. Lee, National Cheng Kung University, Taiwan
H. K. Liu, National Taiwan University, Taiwan
C. Y. Nee, Highlight Optoelectronics Inc., Taiwan
C. L. Pan, National Chao Tung University, Taiwan
H. T. Shang, Prime Optical Fiber Corp., Taiwan
Y. K. Su, National Cheng Kung University, Taiwan
K. F. Tsai, RiteKom Photonics Corp., Taiwan
Y. K. Tu, Chunghua Telecommunications, Taiwan
W. S. Wang, National Taiwan University, Taiwan
C. C. Yang, National Taiwan University, Taiwan
Comptroller: Y. C. Lai, National Chao Tung University, Taiwan

Local Arrangement Committee

Chair: H. C. Chang, National Taiwan University, Taiwan
Members: P. Chang, National Taiwan University, Taiwan
Y. P. Chiou, National Taiwan University, Taiwan
Z. C. Feng, National Taiwan University, Taiwan
M. C. Ho, National Taiwan University, Taiwan

J. H. Lee, National Taiwan University, Taiwan
H. K. Liu, National Taiwan University, Taiwan
L. S. Huang, National Taiwan University, Taiwan
Y. W. Kiang, National Taiwan University, Taiwan
S. L. Lee, National Taiwan Univ. of Science and Tech., Taiwan
C. W. Lin, National Taiwan University, Taiwan
H. H. Lin, National Taiwan University, Taiwan
M. H. Mao, National Taiwan University, Taiwan
S. L. Tsao, National Taiwan Normal University, Taiwan
C. C. Wu, National Taiwan University, Taiwan

Technical Program Committee

Chair: C. C. Yang, National Taiwan University, Taiwan
Secretaries: C. C. Wu, National Taiwan University, Taiwan
P. Chang, National Taiwan University, Taiwan

Sub-committees:

1. Gas, Liquid and Solid-State Lasers

Co-Chairs: J. Piper, Macquarie University, Australia
K. Ueda, University of Electro-Communications, Japan
Members: J. Harvey, University of Auckland, New Zealand
A. B Petersen, Spectra-Physics OEM Products, USA
Y. J. Huo, Tsinghua University, Beijing, China
Y. F. Chen, National Chiao Tung University, Taiwan

2. Semiconductor Materials, Lasers and Related Devices

Co-Chairs: C. E. Zah, Corning Inc., USA
F. Koyama, Tokyo Institute of Technology, Japan
Members: C. P. Lee, National Chiao Tung University, Taiwan
W. Lin, LandMark Optoelectronics Corporation, Taiwan
K. Uomi, OpNext Japan, Inc., Japan
T. Miyajima, Sony Corporation, Japan
Y. H. Lee, KAIST, Korea
C. J. Chang-Hasnain, University of California, USA
D. Ackermann, Agrere Systems, USA
T. A Nirmalathas, University of Melbourne, Australia
M. C. Amann, Technical University of Munich, Germany
B. H. Verbeek, JDS-Uniphase, The Netherlands

3. High-Field Lasers and Ultra-Short Wavelength Radiation

Co-Chairs: S. L. Chin, Laval University, Canada
K. Miyazaki, Kyoto University, Japan
Members: C. Barty, Lawrence Livermore National Laboratory, USA
M.H.R. Hutchinson, Rutherford Appleton Laboratory, UK
K. Midorikawa, RIKEN, Laser Technology Laboratory, Japan
G.A. Mourou, University of Michigan, USA
C. H. Nam, Korea Advanced Institute of Science and Technology (KAIST), Korea
D. Normand, Service des Photons, Atomes et Molécules, DSM/DRECAM/SPAM, France
R. Sauerbrey, Friedrich Schiller University Jena, Germany
Z. Z. Xu, Shanghai Institute of Optics and Fine mechanics,

China

4. Quantum Optics, Laser Spectroscopy and Their Applications

Co-Chairs: H. L. Dai, University of Pennsylvania, USA
K. Yamanouchi, University of Tokyo, Japan
Members: O. A. Aktsipetrov, Moscow State University, Russia
F. A. Kong, Chinese Academy of Science, China
R. J. Levis, Wayne State University, USA
S. H. Lin, Academia Sinica, Taiwan
Y. R. Shen, University of California, USA

5. Nonlinear Optics

Co-Chairs: H. Ito, Tohoku University, Japan
M. Fejer, Stanford University, USA
Members: P. Smith, ORC, Southampton University, Europe
Y. C. Huang, National TsingHua University, Taiwan
B. Orr, Department of Chemistry, Macquarie University, Australia
B. K. Rhee, Sogang University, Korea
N. Sarukura, Molecular Research Institute, Japan
S. Haidar, RIEC, Tohoku University, Japan
Y. Mori, Osaka University, Japan

6. Ultra-Fast Phenomena and Optoelectronics

Co-Chairs: O. Wada, Kobe University, Japan
C. L. Pan, National Chiao Tung University, Taiwan
Members: M. Nakazawa, Tohoku University, Japan
J. Zhang, Chinese Academy of Science, China
K. Torizuka, AIST, Japan
A. Miller, University of St Andrews, UK
T. Kobayashi, University of Tokyo, Japan
M. Hangyo, Osaka University, Japan
C. K. Sun, National Taiwan University, Taiwan
R. Trebino, Georgia Institute of Technology, USA

7. Optical Material and Fabrication Techniques

Co-Chairs: C. T. Chen, Beijing Center for Crystal R&D, Chinese Academy of Sciences, China
T. Sasaki, Osaka University, Japan
Members: T. Fukuda, Tohoku University, Japan
K. Kitamura, Japan
M. H. Jiang, Shandong University, China
N. B. Ming, Nanjing University, China
Z. G. Wang, Chinese Academy of Sciences, China
C. W. Lan, National Taiwan University, Taiwan
B. H.T. Chai, Crystal photonics, Inc., USA
L. Isaenko, Russian Academy of Sciences, Russia

8. Fiber Optics, Micro-Optics, Integrated and Guided-Wave Optics

Co-Chairs: Y. J. Chen, University of Maryland Baltimore County, USA
K. Okamoto, NEL, Japan

Members: K. Takiguchi, NTT Photonics Laboratories, Japan
M. Izutsu, Communications Research Lab, Japan
T. Kaino, Tohoku University, Japan
Y. Kokubun, Yokohama National University, Japan
M. Nishimura, Sumitomo Electric Industries, Japan
W. P. Huang, Apollo Photonics Inc, USA
S. Chu, Little Optics, USA
N. Boos, Corning FRC, France

9. Optical Switching, Computing, Information Processing and Storage

Co-Chairs: P. Yeh, University of California at Santa Barbara, USA
K. Y. Hsu, National Chiao Tung University, Taiwan

Members: B. Lee, National Seoul University, Korea
N. Kim, National Chungbuk University, Korea
T. Yatagai, Tsukuba University, Japan
K. Kuroda, University of Tokyo, Japan
R. Lessard, Laval University, Canada
C. Gu, UCSC, USA
D. Psaltis, Caltech, USA
F. Yu, Penn State University, USA
M. Gu, Swinburne University of Technology, Australia

10. Laser Metrology and Environmental Optics

Co-Chairs: N. Sugimoto, National Institute for Environmental Studies, Japan
H. Kuze, Chiba University, Japan

Members: D. C. Su, National Chiao Tung University, Taiwan
J. W. Hahn, Yonsei University, Korea
D. S. Mehta, Indian Institute of Technology, Delhi, India
M. Takeda, The University of Electro-Communications, Japan
K. Hotate, University of Tokyo, Japan
H. Matsumoto, National Metrology Institute of Japan, Japan
K. Nakamura, Tokyo Institute of Technology, Japan

11. Laser Chemistry, Materials Processing and Industrial Applications

Co-Chairs: K. Sugioka, The Institute of Physical and Chemical Research (RIKEN), Japan
Y. F. Lu, National University of Singapore, Singapore

Members: Z. G. Cheng, SIOFM, P. R., China
D. Chrisey, NRL, USA
F. Dausinger, Universitaet Stuttgart, Germany
W. F. Hsien, National Chiao Tung University, Taiwan
N. Rizvi, Exitech Limited, UK
Y. Tsuboi, Hokkaido University, Japan
Y. Nakata, Kyushu University, Japan

H. Niino, AIST, Japan

12. Medical and Biological Applications

Co-Chairs: Z. P. Chen, University of California at Irvine, USA
K. Shimizu, Hokkaido University, Japan

Members: C. J. Chang, Chang Gung Memorial Hospital, Taiwan
M. Chen, Beijing University, China
H. H. Chiang, National Yang Ming University, Taiwan
M. Gu, Swinburne University of Technology, Australia
M. Haruna, Osaka University, Japan
F. J. Kao, National Sun-Yat-Sen University, Taiwan
B. H. Lee, Kwangju Institute of Science and Technology, Korea
Q. Luo, Huazhong University of Science and Technology, China
H. Ma, Tsinghua University, China
E. Okada, Keio University, Japan
D. D. Sampson, University of Western Australia, Australia

13. Lightwave Communications and Networks

Co-Chairs: G. K. Chang, Georgia Institute of Technology, USA
K. Sato, NTT, Japan

Members: A. VonLemen, Telcordia Technologies, USA
K. Kitayama, Osaka University, Japan
M. Kang, Information and Technology University, Korea
A. Gladisch, T-Systems, Deutsche Telekom, Germany
Y. Kajiki, NEC Corporation, Japan

14. Optoelectronic Device and Optical System Modeling

Co-Chairs: C. Menyuk, University of Maryland Baltimore County, USA
H. C. Chang, National Taiwan University, Taiwan

Members: J. Arnold, University of Glasgow, UK
K. S. Chiang, City University of Hong Kong, Hong Kong, China
N. Dagli, University of California, USA
J. Love, Australian National University, Australia
J. Yamauchi, Hosei University, Japan
K. Yasumoto, Kyushu University, Japan
D. Q. Chowdhury, Corning Incorporated, USA
A. J. Lowery, Osg. Vpissystems Pty Ltd, Australia
M. Matsumoto, Osaka University, Japan
P. Poggolini, Universita di Torino, Italy
S. Turitsyn, Aston University, UK
P.-K. A. Wai, Hong Kong Polytechnic Univ., Hong Kong, China

15. Optical Micro-Electro-Mechanical Systems

Co-Chairs: L. Y. Lin, Tellium Inc., USA
H. Fujita, University of Tokyo, Japan

Members: W. L. Fang, National Tsing-Hwa University, Taiwan
H. Toshiyoshi, University of Tokyo, Japan

N. Tien, UC Davis, USA
M. C. Wu, UCLA, USA
T. Bourouina, ESIEE, Cité Descartes, France
N. de Rooij, University of Neuchatel, Switzerland
K. Hjort, Uppsala University, Sweden

16. Photonic Crystals and Nano-Optics Structures

Co-Chairs: S. Noda, Kyoto University, Japan
A. Scherer, California Institute of Technology, USA

Members: T. Baba, Yokohama National University, Japan
M. Notomi, NTT, Japan
Y. H. Lee, Korea Advanced Institute of Science and Technology, Korea
K. Sakoda, NRIM, Japan
T. Sato, Tohoku University, Japan
Y. W. Kiang, National Taiwan University, Taiwan

17. Display and Lighting Devices

Co-Chairs: H. S. Kwok, The Hong Kong University of Science & Technology, Hong Kong, China
S. Kobayashi, Science University of Tokyo in Yamaguchi, Japan

Members: N. Peyghambarian, University of Arizona, USA
T. Taguchi, Yamagata University, Japan
G. Craford, Luminleds, USA
J. I. Chyi, National Central University, Taiwan
A. Fuh, National Cheng Kung University, Taiwan
S. D. Lee, Seoul National University, Korea

SS1. Development of Solid-State Lighting

Chair: J. I. Chyi, National Central University, Taiwan

SS2. Semiconductor Quantum Dots and Applications

Chair: Y. Arakawa, University of Tokyo, Japan

SS3. Development of High-Field Lasers and Ultra-Short Wavelength Radiation

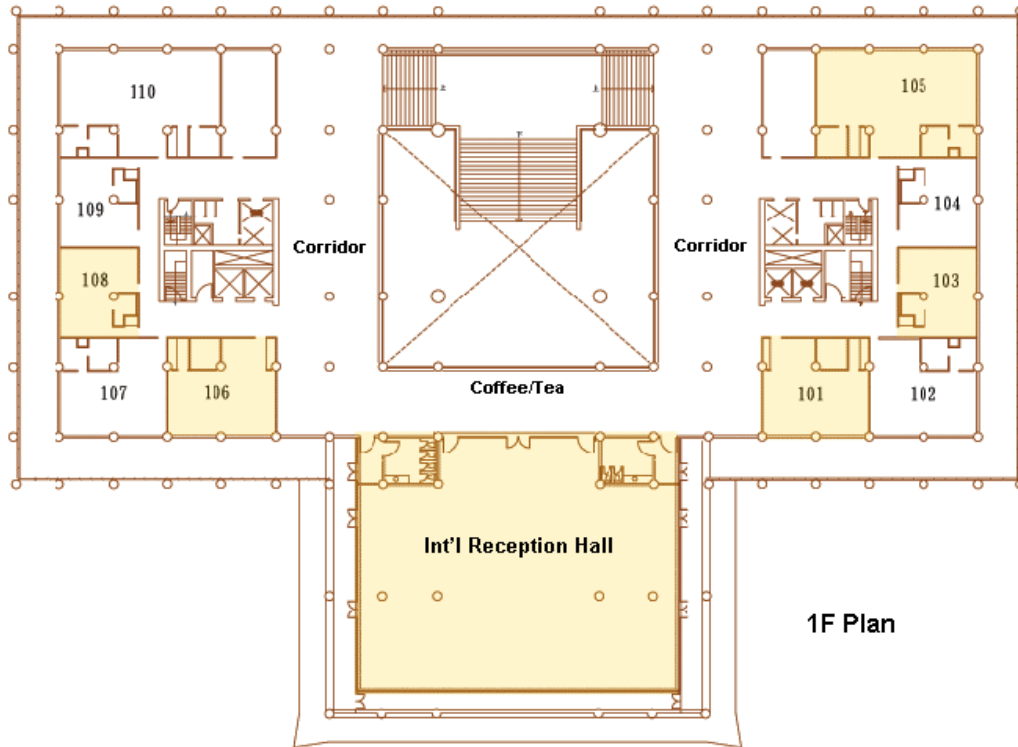
Co-Chairs: S. L. Chin, Laval University, Canada
K. Miyazaki, Kyoto University, Japan

Short Course Committee

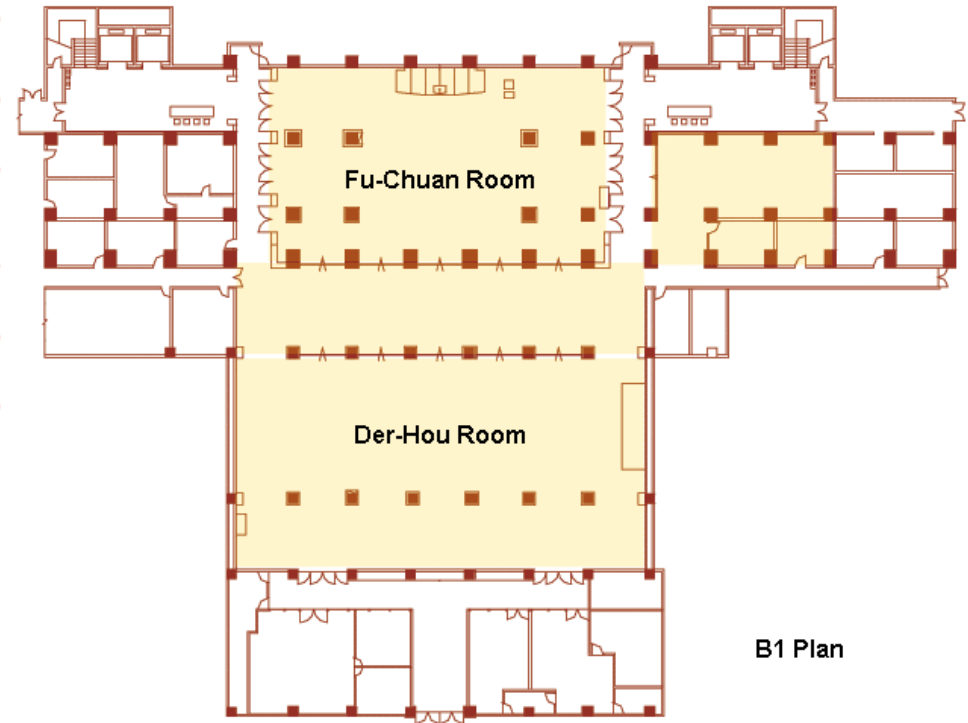
Co-Chairs: W. H. Cheng, National Sun Yat-Sen University, Taiwan
S. L. Tsao, National Taiwan Normal University, Taiwan

THE GRAND HOTEL (CONFERENCE SITE)

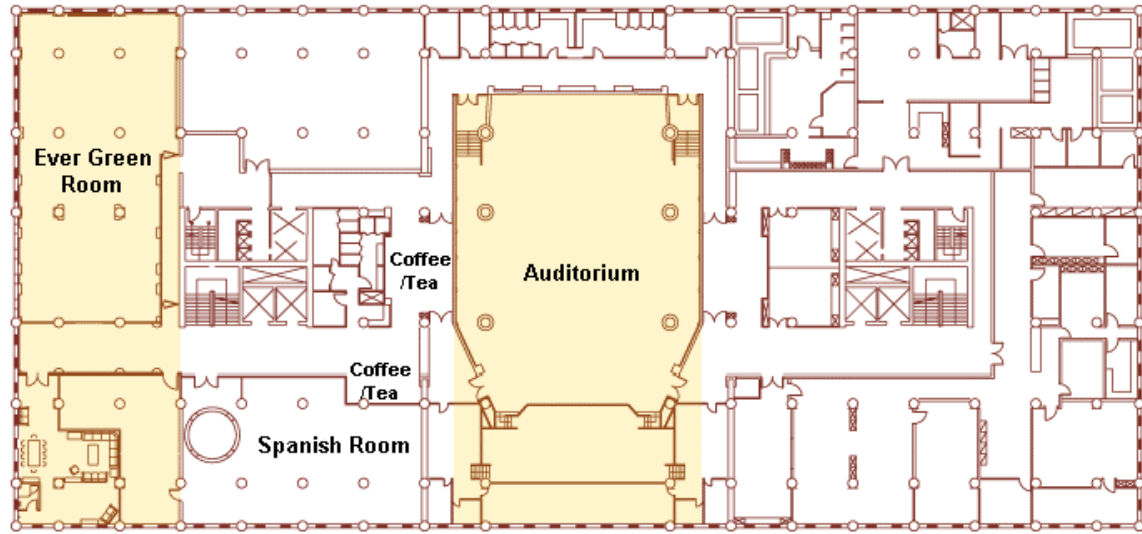
Floor Plan



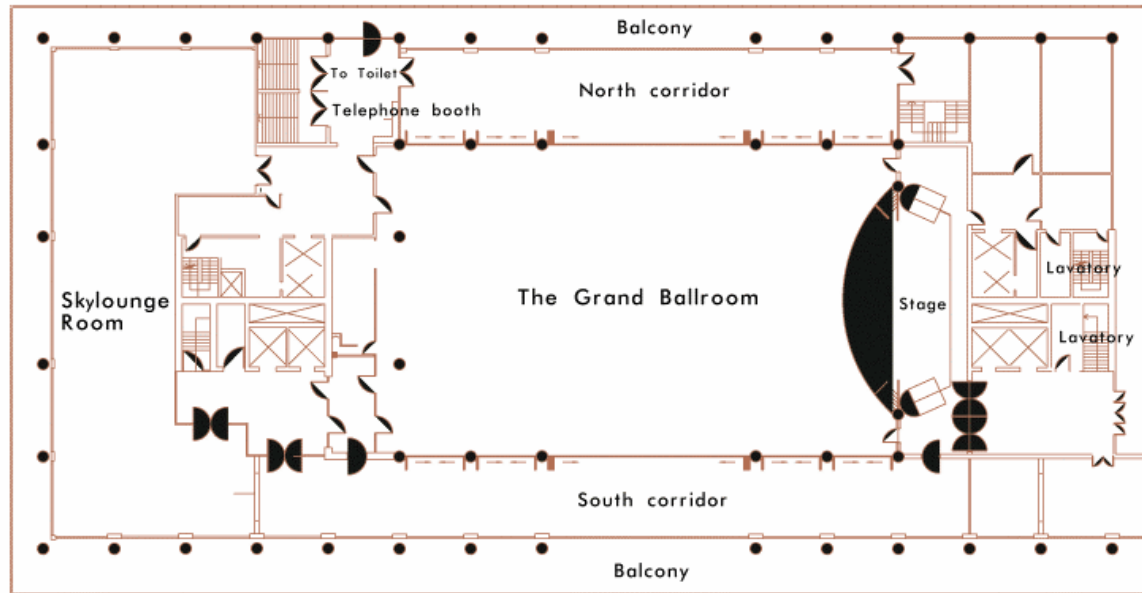
1F Plan



B1 Plan



10F Plan



12F The Grand Ballroom/Skylounge Room

AGENDA of SESSIONS -- Tuesday, December 16, 2003

Room 101 -- (1F)

Room 105 -- (1F)

Room 106 -- (1F)

Room 107 -- (1F)

Room 110 -- (1F)

Plenary Session
The Grand Ballroom (12F)
9:00-12:30

Table Top Exhibit
Corridor (1F)
12:00-18:00

Lunch Break

**TU3I • Waveguide
Devices (I)**

14:00-15:30

**TU3H • Optical
Information Processing
and Switching**

14:00-15:30

**TU3E • Solid-State
Lighting (I)**

14:00-15:30

**TU3G • Ultrashort
Pulses, Solitons and
Mode-locking**

14:00-15:30

Coffee/Tea Break (1F, 10F)
15:30-16:00

TU4I • Optical MEMS (I)

16:00-18:00

**TU4H • Optical
Information Processing
(I)**

16:00-18:15

**TU4E • Solid-State
Lighting (II)**

16:00-17:45

**TU4G • Femtosecond
Materials and Device
Application**

16:00-18:00

Conference Reception, The Grand Ballroom (12F)
18:30-20:00

AGENDA of SESSIONS -- Tuesday, December 16, 2003

Int'l Reception Hall -- (1F)

Ever Green Room -- (10F)

Spanish Room -- (10F)

Auditorium -- (10F)

Sky Lounge -- (12F)

Plenary Session
The Grand Ballroom (12F)
 9:00-12:30

Table Top Exhibit
Corridor (1F)
 12:00-18:00

Lunch Break

TU3F • Quasi Phase Matching Devices and Application (I) 14:00-15:30	TU3B • Inter-subband and Nano-structure Emitters 14:00-15:30	TU3D • New Advances in Some Ultrafast Intense Laser Laboratories (I) 14:00-15:30	TU3C • Fundamentals of Photonic Crystal and Photonic Crystal Fibers 14:00-15:30	TU3A • Advanced Transmission Systems 14:00-15:30
---	--	--	---	--

Coffee/Tea Break (1F, 10F)
 15:30-16:00

TU4F • Quasi Phase Matching Devices and Application (II) 16:00-18:15	TU4B • Tunable Lasers and Broadband Light Sources 16:00-18:00	TU4D • New Advances in Some Ultrafast Intense Laser Laboratories (II) 16:00-18:00	TU4C • Photonic Crystal and Devices for Communications 16:00-18:00	TU4A • Optical Communication Systems Modeling 16:00-18:00
--	---	---	--	---

Conference Reception, The Grand Ballroom (12F)
 18:30-20:00

AGENDA of SESSIONS -- Wednesday, December 17, 2003

Room 101 -- (1F)	Room 105 -- (1F)	Room 106 -- (1F)	Room 107 -- (1F)	Room 110 -- (1F)
W1I • Optical MEMS (II) 08:30-10:00	W1E • Optical Coherence Tomography (I) 08:30-10:15	W1H • Optical Storage (I) 08:30-09:45	W1J • Optical Networking Technologies 08:30-10:15	W1G • Ultrafast Pulse Generation 08:30-10:00
Coffee/Tea Break (1F, 10F) 10:00-10:30				
W2J • Fiber Amplifiers Modeling and Fiber Devices Design 10:30-12:15	W2E • Optical Coherence Tomography (II) 10:30-12:30	W2H • Optical Information Processing (II) 10:30-12:30	W2A • Next Generation Transport Systems 10:30-12:30	W2G • Ultrafast Pulse Measurement and Coherent Transient 10:30-12:30
Lunch Break				
WP (Poster Paper) Der-Hou Room (B1F) 13:30-15:30				
Coffee/Tea Break (B1F, 1F, 10F) 15:30-16:00				
W4D • High-field Laser Physics 16:00-18:00	W4E • Confocal, Multi-Photon and Nonlinear Optical Microscope 16:00-18:00	W4H • Optical Storage (II) 16:00-18:00	W4A • DWDM Systems 16:00-18:00	W4G • THz Radiation and Imaging 16:00-18:00
Conference Banquet, Fu-Chuan Room (B1) 18:30-20:00				

AGENDA of SESSIONS -- Wednesday, December 17, 2003

Int'l Reception Hall -- (1F)		Ever Green Room -- (10F)		Spanish Room -- (10F)		Auditorium -- (10F)		Sky Lounge -- (12F)	
W1F • Nonlinear Dynamics		W1B • Lasers and Detectors		W1D • Beam Propagation and X-ray Application		W1C • Near Field Spectroscopy and Luminescence in Photonic Crystals and Related Materials		W1A • Numerical Techniques in Photonics	
08:30-10:00		08:30-10:00		08:30-10:00		08:30-10:00		08:30-10:00	
Coffee/Tea Break (1F, 10F) 10:00-10:30									
W2F • Fundamental Nonlinear Optics		W2B • VCSEL		W2D • High-field Interaction with Atoms and Molecules		W2C • Crystal Lasers and Related Devices		W2I • Optical Fiber	
10:30-12:30		10:30-12:30		10:30-12:30		10:30-12:30		10:30-12:30	
Lunch Break									
WP (Poster Paper) Der-Hou Room (B1F) 13:30-15:30						Industrial Forum – Solid State Lighting Technology and Market Trends 14:30-15:30		WP (Poster Paper) Der-Hou Room (B1F) 13:30-15:30	
Coffee/Tea Break (B1F, 1F, 10F) 15:30-16:00									
W4F • THz-Wave Nonlinear Optics		W4B • GaN Light Sources		W4C • Modeling of Photonic-Crystal/Periodic Structures		Industrial Forum – Solid State Lighting Technology and Market Trends		W4J • Waveguide Devices (II)	
16:00-18:00		16:00-18:00		16:00-18:00		16:00-18:30		16:00-18:00	
Conference Banquet, Fu-Chuan Room (B1) 18:30-20:00									

AGENDA of SESSIONS -- Thursday, December 18, 2003

Room 101 -- (1F)	Room 105 -- (1F)	Room 106 -- (1F)	Room 107 -- (1F)	Room 110 -- (1F)
TH1I • Fibre Lasers 08:30-10:15	TH1E • In vivo Optical Imaging and Tomography 08:30-10:00	TH1H • Optical Computer 08:30-10:00	TH1G • Coherent Control of Reactions 08:30-10:00	TH1J • Novel Devices and Materials 08:30-10:00
Coffee/Tea Break (1F, 10F) 10:00-10:30				
TH2I • UV-VIS Solid-state Lasers 10:30-12:15	TH2E • Photon Migration and Diffuse Optical Imaging 10:30-12:15	TH2H • Nonlinear Optical Materials (I) 10:30-12:30	TH2G • Coherent and Ultrafast Processes on Surfaces 10:30-12:30	TH2J • 1.3μm Laser 10:30-12:30
Lunch Break				
THP (Poster Paper) Der-Hou Room (B1F) 13:30-15:30				
Coffee/Tea Break (B1F, 1F) 15:30-16:00				
TH4J • Material Synthesis and Nanotechnology 16:00-18:00	TH4E • Liquid Crystal Display Technologies 16:00-18:00	TH4H • Nonlinear Optical Materials (II) 16:00-18:00	TH4G • Nonlinear Optics at Surfaces 16:00-18:00	TH4I • High Power Gas Lasers 16:00-17:45

AGENDA of SESSIONS -- Thursday, December 18, 2003

Int'l Reception Hall -- (1F)	Ever Green Room -- (10F)	Spanish Room -- (10F)	Auditorium -- (10F)	Sky Lounge -- (12F)
TH1F • Characterization of Nonlinear Optical Properties	TH1B • Advanced Metrology	TH1D • THz Detector, Emitter and Applications	TH1C • Analysis of Photonic Crystal Fibers and Waveguides	TH1A • Network Design and Operation
08:30-10:00	08:30-10:00	08:30-10:00	08:30-10:00	08:30-10:00
Coffee/Tea Break (1F, 10F) 10:00-10:30				
TH2F • Nonlinear Frequency Conversion and Propagation	TH2B • Quantum Dot Physics and Application (I)	TH2D • Heterodyne Metrology	TH2C • Fabrication of Photonic Crystal Devices and Related Microstructures	TH2A • Optical Components (I)
10:30-12:30	10:30-12:30	10:30-12:30	10:30-12:30	10:30-12:30
Lunch Break				
THP (Poster Paper) Der-Hou Room (B1F) 13:30-15:30				
Coffee/Tea Break (B1F, 1F) 15:30-16:00				
TH4C • Guided-wave Devices and Design	TH4B • Quantum Dot Physics and Devices (II)	TH4D • New Metrology		TH4A • Optical Components (II)
16:00-17:45	16:00-17:45	16:00-18:00		16:00-18:00

AGENDA of SESSIONS -- Friday, December 19, 2003

Room 101 -- (1F)	Room 105 -- (1F)	Room 106 -- (1F)	Room 107 -- (1F)	Room 110 -- (1F)
F1D • Lidar and Environmental Sensing (II) 08:30-10:00	F1E • Laser-Cell, Laser Tissue Interactions and Optical Biopsy 08:30-10:00	F1H • Laser Materials 08:30-10:00	F1G • Quantum Optics and Spectroscopy 08:30-09:45	F1I • Solid State Dye and Novel Solid State Lasers 08:30-10:00
Coffee/Tea Break (1F, 10F) 10:00-10:30				
F2D • Lidar and Environmental Sensing (III) 10:30-12:30	F2E • Optical Sensing and Applications in Life Science 10:30-12:45	F2H • Opto-electronics Materials and Fabrication 10:30-12:30	F2G • Ultrafast and High Field Laser Induced Processes 10:30-12:30	F2I • High Power Solid State Lasers and Thermal Issues 10:30-12:45

AGENDA of SESSIONS -- Friday, December 19, 2003

Int'l Reception Hall -- (1F)	Ever Green Room -- (10F)	Spanish Room -- (10F)	Auditorium -- (10F)	Sky Lounge -- (12F)
F1F • Femtosecond Laser Processing 08:30-10:00	F1C • Metallic and Dielectric Photonic Crystals 08:30-10:00	F1A • Optical Components (III) 08:30-10:00		
Coffee/Tea Break (1F, 10F) 10:00-10:30				
F2F • Microfabrication and Microsystems 10:30-12:30	F2C • Organic Light Emitting Diodes 10:30-12:45	F2A • Novel Optical Devices and Fabrication 10:30-12:30		