

CONFERENCE OVERVIEW AND REGISTRATION INFORMATION



CLEO:2012

LASER SCIENCE TO PHOTONIC APPLICATIONS

**DISCOVER PIONEERING RESEARCH.
SHARE IDEAS. NETWORK.**

6-11 May 2012

SAN JOSE McENERY CONVENTION CENTER
San Jose, CA, USA

- **Technical Conference: 6-11 May**
- **Exhibit: 8-10 May**

CLEO: QELS—FUNDAMENTAL SCIENCE

CLEO: SCIENCE & INNOVATIONS

CLEO: APPLICATIONS & TECHNOLOGY

REGISTER NOW AND SAVE!
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FEATURING:

CLEO: EXPO

CLEO: MARKET FOCUS

CLEO:2012 CONFERENCE OVERVIEW

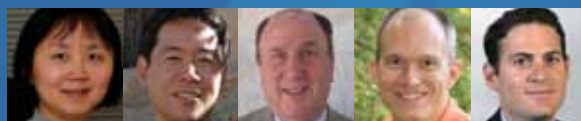
WHY YOU WANT TO ATTEND CLEO: 2012

HEAR INNOVATIVE RESEARCH. SHARE IDEAS. NETWORK.

CLEO: 2012 offers timely, world-renowned technical programming, peer-reviewed by an esteemed cadre of industry and academic leaders from the lasers and electro-optics community.

- World-renowned, peer-reviewed program organized by esteemed leaders in the industry and academia
- 1700 technical presentations
- More than 100 prominent, invited speakers
- Plenary Sessions – 4 dynamic keynote speakers will share their vision on timely topics
- 24 short courses offering expert instruction on essential topics
- 6 Special Symposia
- 20 Tutorials
- 380 Poster Sessions
- More than 300 participating companies showcasing the latest products at CLEO: Expo
- Free Exhibit Floor Market Focus program on trends and commercial developments, Technology Transfer program and more!
- Online Job Fair
- Opportunities to connect with colleagues, experts from academia and industry, forge new relationships and exchange ideas.

CLEO: 2012 CHAIRS



Hui Cao, Hideo Mabuchi, Robert Fisher, Paul Juodawlkis, James Tunnell

GENERAL CHAIRS

CLEO: QELS—Fundamental Science General Co-Chairs:
Hui Cao, Yale Univ., USA; Hideo Mabuchi, Stanford Univ., USA

CLEO: Science & Innovations General Co-Chairs:
Robert Fisher, RA Fisher Associates, LLC, USA; Paul Juodawlkis, MIT Lincoln Lab, USA

CLEO: Applications & Technology General Chair:
James Tunnell, Univ. of Texas at Austin, USA



Demetrios Christodoulides, Norbert Lütkenhaus, Craig Arnold, René-Jean Essiambre, Mike Wraback

PROGRAM CHAIRS

CLEO: QELS—Fundamental Science Program Co-Chairs:
Demetrios Christodoulides, School of Optics, CREOL, Univ. of Central Florida, USA; Norbert Lütkenhaus, Univ. of Waterloo, Canada

CLEO: Science & Innovations Program Co-Chair:
Craig Arnold, Princeton Univ., USA; René-Jean Essiambre, Bell Labs, Alcatel-Lucent, USA

CLEO: Applications & Technology Program Chair:
Mike Wraback, ARL, USA

PRELIMINARY CONFERENCE SCHEDULE

	SUNDAY 6 MAY	MONDAY 7 MAY	TUESDAY 8 MAY	WEDNESDAY 9 MAY	THURSDAY 10 MAY	FRIDAY 11 MAY
GENERAL						
Registration	07:30-17:30	07:00-18:00	07:00-18:30	07:30-18:30	07:30-18:30	07:30-12:30
CLEO TECHNICAL PROGRAMMING						
Short Courses	09:00-17:00	08:30-17:00	08:30-17:00			
Technical Sessions, Tutorials, and Symposia		08:00-18:00	08:00-18:30	13:30-18:30	08:00-18:30	08:00-12:30
Poster Sessions				13:30-15:00 18:30-20:30	11:30-13:00	
Postdeadline Paper Sessions					20:00-22:00	
EXPOSITION AND SHOW FLOOR ACTIVITIES						
CLEO: Expo			10:00-17:00	10:00-17:00	10:00-15:00	
Unopposed Exhibit Time			10:00-11:00 13:00-14:00	12:30-13:30 15:00-16:30	10:00-11:30 13:00-14:00	
CLEO: Market Focus Program			10:30-12:30 14:00-16:00	10:30-12:30 14:00-16:00		
Power Lunch			12:45-13:45			
CLEO: Technology Transfer Program					9:30-12:30	
SPECIAL EVENTS						
Dine-Around		18:30-20:00				
Plenary & Awards Sessions			08:00-10:00	08:00-10:00		
Conference Reception				18:30-20:30		
LasersRock Talent Show				20:30-22:00		

Note: Times and dates are subject to change. All times are Pacific Daylight Times (PDT).

IMPORTANT DATES

MARCH 2012
Conference Program Planner Available

19 MARCH 2012
Advance Registration Deadline

23 MARCH 2012
Postdeadline Submission Deadline

6 APRIL 2012
Housing Deadline

6-8 MAY 2012
Short Courses

6-11 MAY 2012
Technical Conference

8-10 MAY 2012
CLEO: Expo
CLEO: Market Focus (9-10 May)
CLEO: Technology Transfer Exhibit

SPECIAL PROGRAMS

PLENARY SESSIONS



CLEO: SCIENCE & INNOVATIONS

Nonlinear Optics: Past Successes and Future Challenges

Robert W. Boyd, Univ. of Ottawa, Canada



CLEO: QELS - FUNDAMENTAL SCIENCE

Time-Reversed Waves and Subwavelength Focusing

Mathias Fink, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI), France



CLEO: APPLICATIONS & TECHNOLOGY

Development of nonpolar and semipolar InGaN/GaN light-emitting diodes (LEDs) and Laser Diodes

Steven Denbaars, Univ. of California, Santa Barbara, USA



CLEO: SCIENCE & INNOVATIONS

Silicon Integrated Nanophotonics: Road from Scientific Explorations to Practical Applications

Yurii A. Vlasov, IBM TJ Watson Research Center, USA

SYMPOSIA

50TH ANNIVERSARY OF THE SEMICONDUCTOR LASER SYMPOSIUM

Singular Light: Applications of Vortices, Orbital Angular Momentum, Bessel and Airy Beams

Joint CLEO: QELS-Fundamental Science/
CLEO: Science & Innovations/
CLEO: Applications & Technology

SYMPOSIUM ORGANIZERS:

Dan Wasserman, UIUC, USA; Tom Koch, Lehigh Univ., USA; Seth Bank, Univ. of Texas, USA

In this Special Symposium, we will review the historical development and state-of-the-art of the semiconductor laser, which has become ubiquitous to modern society, yet remains a vibrant area of research. These 50 years have witnessed remarkable progress, with device metrics improving by 4+ orders of magnitude in many cases. We will bring together pioneers at the materials, device, and applications levels to recount the history behind the demonstrations of the first semiconductor lasers, the subsequent major milestones in semiconductor laser technology, and the current state-of-the-art of the field, as well as the future of the semiconductor laser.

SPACE OPTICAL SYSTEMS: OPPORTUNITIES AND CHALLENGES

Joint CLEO: Science & Innovations/
CLEO: Applications & Technology

SYMPOSIUM ORGANIZERS:

Nan Yu; Jet Propulsion Lab, USA; David Caplan; MIT Lincoln Lab, USA; Iain Mckinnie; Lockheed Martin/Coherent Technologies, USA

ADVANCES IN HIGH-POWER LASERS AND THEIR APPLICATIONS

Joint CLEO: QELS-Fundamental Science/
CLEO: Science & Innovations

SYMPOSIUM ORGANIZERS:

Iain Mckinnie; Lockheed Martin/Coherent Technologies, USA; Eric Mottay; Amplitude Systemes, France; David Richardson; Univ. of Southampton, UK; John Zuegel; Laboratory for Laser Energetics, Univ. of Rochester, USA

EXPLORING THE QUANTUM FRONTIERS OF COMMUNICATIONS

CLEO: Science & Innovations

SYMPOSIUM ORGANIZERS:

Richard Hughes; Los Alamos National Lab, USA; Tom Chapuran; Telcordia, USA; Robert Jopson; Bell Labs, Alcatel-Lucent, USA; Beth Nordholt; Los Alamos National Lab, USA

QUANTUM ENGINEERING AND ARCHITECTURES

QELS-Fundamental Science

SYMPOSIUM ORGANIZERS:

Bill Munro; NTT BRL, Japan; Gerard Milburn; Univ. of Queensland, Australia

SINGULAR LIGHT: APPLICATIONS OF VORTICES, ORBITAL ANGULAR MOMENTUM, BESSEL AND AIRY BEAMS USING OAM BEAMS FOR TRANSMITTING ORTHOGONAL DATA STREAMS

Joint CLEO: QELS-Fundamental Science/
CLEO: Science & Innovations/
CLEO: Applications & Technology

SYMPOSIUM ORGANIZERS:

Siddharth Ramachandran; Boston Univ., USA; Andrei Rode; Australian National Univ., Australia



CLEO: EXPO EXHIBIT FLOOR PROGRAMS AND ACTIVITIES

8-10 May 2011

POWER LUNCH

Tuesday, 8 May
12:45-13:45

Sponsored by Precision Photonics



Attend the Power Lunch and participate in high-level discussions with industry leaders

who provide insight on how to navigate through a challenging market. Engage one-on-one with experienced leaders representing different markets who share their wisdom on surviving and growing a business during difficult economic times.

This is a ticketed event that sells out quickly—secure your ticket today. Students are offered a discounted ticket price. Visit www.cleoconference.org/info for more information.

CLEO: TECHNOLOGY TRANSFER PROGRAM

Thursday, 10 May
9:30 am - 12:30 pm

The Technology Transfer Program provides a forum for entrepreneurs and researchers from start-ups, major universities, businesses and national laboratories to present exciting new technologies which are ready and available for commercialization. This free program kicks off with a Tutorial about the Licensing process—funding, entrepreneurship, technology transfer and intellectual property. During the Showcase, attendees will hear from several organizations about their latest license-ready optics and photonics technologies (intellectual property from universities and laboratories) that could lead to new commercial products or improve the efficiency, durability or availability of existing components or systems. In addition, organizations will feature their license ready technologies at tabletop displays in the exhibit hall.

Complete program details can be found on the CLEO: 2012 Conference website.

CLEO: MARKET FOCUS

8-9 May

Visit website for a schedule of times

Don't miss this free in-depth, three day forum discussing new products, emerging technologies and markets in the key areas of **BioPhotonics, Defense, Energy and Industrial**. All presentations and discussions focus on the latest in photonics products and services that have been playing an important role in the industry and those that potentially hold a future business opportunity. A key feature of this forum will be the survey of market trends and market sector outlook.



NEW! CLEO: EXPO TECHNOLOGY PLAYGROUND

8-10 May

Top industry players will demonstrate their latest products and services. This exclusive on-floor event allows attendees to participate in lively interactive presentations. Visit Exhibit Activities on the website for details.



TECHNICAL PROGRAM BY CATEGORY

YOU CANNOT AFFORD TO MISS CLEO: 2012 IF YOU WORK IN ANY OF THESE DISCIPLINES

CLEO: 2012 features technical sessions, tutorials and short courses organized by category. Please visit www.cleoconference.org/info for detailed category descriptions and program updates.

CLEO: QELS – FUNDAMENTAL SCIENCE 1: QUANTUM OPTICS OF ATOMS, MOLECULES AND SOLIDS

TUTORIAL SPEAKER

Coherent Control of Cold Matter Waves, *Ennio Arimondo; Università di Pisa, Italy*

INVITED SPEAKERS

Cavity QED with Fiber Cavities: From Atoms to Quantum Well Excitons, *Jakob Reichel; Université Pierre et Marie Curie, France*

Anderson Metal-insulator Transition with the Atomic Kicked Rotor, *Dominique Delande; Université Pierre et Marie Curie, France*

SHORT COURSES

SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

CLEO: QELS – FUNDAMENTAL SCIENCE 2: QUANTUM SCIENCE, ENGINEERING AND TECHNOLOGY

TUTORIAL SPEAKER

Title to be Announced, *Oliver Pfister; Univ. of Virginia, Physics Department, USA*

INVITED SPEAKER

Diamond in Glass, A New Platform for Quantum Photonics, *Andrew Greentree; Univ. of Melbourne, Australia*

Single-Photon Switches, *Prem Kumar; Northwestern Univ., USA*

SHORT COURSES

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*

SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*

SC271 Quantum Information—Technologies and Applications, *Prem Kumar¹, Paul Toliver²; ¹Northwestern Univ., USA, ²Telcordia, USA*

SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*

SC339 A Guide to Building Optical Frequency-comb-based Clocks for Ultralow Noise Signal Generation, *Scott Diddams, Chris Oates; NIST, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

SC362 Cavity Optomechanics: Fundamentals and Applications of controlling and measuring nano- and micro-mechanical oscillators with laser light, *Tobia Kippenberg; Swiss Federal Inst. of Technology Lausanne, Switzerland*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

CLEO: QELS – FUNDAMENTAL SCIENCE 3: METAMATERIALS AND COMPLEX MEDIA

TUTORIAL SPEAKER

Defining New Optics with Metamaterials, *David R. Smith; Duke Univ., USA*

INVITED SPEAKERS

Nonlocal Optical Phenomena in Metamaterials, *Viktor A. Podolskiy; Univ. of Massachusetts Lowell, USA*

Purcell Effect, Surface Modes and Nonlocality in Hyperbolic Metamaterials, *Pavel Belov; Queen Mary Univ. of London, UK*

SHORT COURSES

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*

SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*

SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

CLEO: QELS – FUNDAMENTAL SCIENCE 4: OPTICAL INTERACTIONS WITH CONDENSED MATTER AND ULTRAFAST PHENOMENA

INVITED SPEAKERS

Photoinduced Phase Transitions in Strongly Correlated Electron Systems, *Shin-ya Koshihara; Tokyo Inst. of Technology, Japan*

Ultrafast Dynamics and Coherent Control in Graphene, *Theodore Norris; Univ. of Michigan, USA*

SHORT COURSES

SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*

SC182 Biomedical Optical Diagnostics and Sensing, *Sebastian Wachsmann-Hogiu, NSF; Univ. of California at Davis, USA*

SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

NEW! SC377 Fundamentals of Lasers, *Randy A. Bartels; Colorado State Univ., USA*

NEW! SC378 Introduction to Ultrafast Optics, *Rick Trebino; Georgia Inst. of Technology, USA*

CLEO: QELS – FUNDAMENTAL SCIENCE 5: NONLINEAR OPTICS AND NOVEL PHENOMENA

TUTORIAL SPEAKER

Microcavity Polaritons: Quantum Fluid Phenomena and Optoelectronic Applications, *Alberto Bramati; Laboratoire Kastler Brossel, Université Pierre et Marie Curie, Ecole Normale Supérieure et CNRS, Paris, France*

INVITED SPEAKERS

Quantum Phenomena in Laser-Written Waveguide Arrays, *Alex Szameit; Univ. of Jena, Germany*

Reversal of Photon Scattering Decoherence, *Roei Ozeri; Weizmann, Israel*

SHORT COURSES

SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*

SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*

SC339 A Guide to Building Optical Frequency-comb-based Clocks for Ultralow Noise Signal Generation, *Scott Diddams, Chris Oates; NIST, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

SC361 Coherent Mid-Infrared Sources and Applications, *Konstantin Vodopyonov; Stanford Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

CLEO: QELS – FUNDAMENTAL SCIENCE 6: NANO-OPTICS AND PLASMONICS

TUTORIAL SPEAKER

Surface Plasmon Circuitry in Opto-Electronics, *Alain Dereux; Université de Bourgogne, France*

INVITED SPEAKERS

Infrared Nanophotonics, *Rainer Hillenbrand; CIC nanoGUNE, Spain*

Magnetic Light-Matter Interactions: Quantifying and Exploiting Magnetic Dipole Transitions, *Rashid Zia; Brown Univ., USA*

SHORT COURSES

SC182 Biomedical Optical Diagnostics and Sensing, *Sebastian Wachsmann-Hogiu, NSF; Univ. of California Davis, USA*

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*



SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*

SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

CLEO: QELS – FUNDAMENTAL SCIENCE 7: HIGH-FIELD PHYSICS AND ATTOSCIENCE

TUTORIAL SPEAKER

High Harmonic Spectroscopy of Attosecond Dynamics, *Misha Ivanov; Imperial College London, UK*

INVITED SPEAKERS

Dynamics of Electron Acceleration in Plasmas, *Laszlo Veisz; Max-Planck-Institut fuer Quantenoptik, Germany*

Strong-field Effects in Solids, *David Reis; Stanford PULSE Inst., SLAC National Accelerator Laboratory MS, USA*

SHORT COURSES

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

QELS 8: OTHER TOPICS IN QUANTUM ELECTRONICS AND LASER SCIENCE

SHORT COURSES

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

SC317 Laser Tweezers: Moving Tiny Things with Light, *Kristian Helmerson, NIST, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

SC362 Cavity Optomechanics: Fundamentals and Applications of controlling and measuring nano- and micro-mechanical oscillators with laser light, *Tobia Kippenberg; Swiss Federal Inst. of Technology Lausanne, Switzerland*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

**CLEO: SCIENCE & INNOVATION 1:
LIGHT-MATTER INTERACTIONS AND
MATERIALS PROCESSING**

TUTORIAL SPEAKER

Ultrafast Laser Writing in Transparent Materials: From Physics to Applications, *Peter Kazansky; Univ. of Southampton, UK*

INVITED SPEAKERS

Theory of Ultrafast Laser-matter Interactions, *Barbel Rethfield, Univ. of Kaiserslautern, Germany*

Energy Conversion Processes in Laser-matter Interactions, *Xianfan Xu; Purdue Univ., USA*

SHORT COURSES

- SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*
- SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*
- SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*
- SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*
- NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

**CLEO: SCIENCE & INNOVATION 2:
SOLID-STATE, LIQUID, GAS, AND
HIGH-INTENSITY LASERS**

TUTORIAL SPEAKER

Key Laser Technologies for Next Generation X-ray Sources, *Franz X. Kärtner; CFEL-DESY, Universität Hamburg, Germany; MIT, USA*

INVITED SPEAKERS

Reliable Laser Technology for Laser Peening Applications, *Lloyd Hackel; Metal Improvement Corp., USA*

Picosecond Thin-Disk Amplifiers with High Average Power for Pumping Optical Parametric Amplifiers, *Thomas Metzger; Max-Planck-Institute of Quantum Optics, Germany*

Applications and Performance of Epoxy-free Composite Laser Optics, *Nick Traggis; Precision Photonics Corp, USA*

SHORT COURSES

- SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*
- SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*
- SC165 Laser Diode-Pumped Solid-State Lasers, *Larry Marshall; Southern Cross Venture Partners, USA*
- SC361 Coherent Mid-Infrared Sources and Applications, *Konstantin Vodopyonov; Stanford Univ., USA*
- NEW! SC377 Fundamentals of Lasers, *Randy A. Bartels; Colorado State Univ., USA*

**CLEO: SCIENCE & INNOVATIONS 3:
SEMICONDUCTOR LASERS**

INVITED SPEAKERS

Electrically-pumped UV Nanowire Lasers, *Jianlin Liu; Univ. of California Riverside, USA*

Ultra-Low Threshold and High Speed Electrically Driven Photonic Crystal Nanocavity Lasers and LEDs, *Jelena Vuckovic; Stanford Univ., USA*

OPCPA for High-Field-Physics, *Ming Wu; Univ. of California Berkeley, USA*

SHORT COURSES

- SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*
- SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA.*
- SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*
- NEW! SC375 Applications of Mid-Infrared Quantum Cascade Lasers in Health and the Environment, *Yamac Dikmelik; Department of Electrical and Computer Engineering, Johns Hopkins Univ., USA*
- NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

**CLEO: SCIENCE & INNOVATION 4:
NONLINEAR OPTICAL TECHNOLOGIES**

TUTORIAL SPEAKER

Light Filaments: An Intricate Case of Light Matter—Matter-Light Interaction, *Jean-Claude Diels; Univ. of New Mexico, USA*

INVITED SPEAKERS

Development of Periodically Oriented Gallium Nitride, *Jennifer Hite, Naval Research Labs, USA*

Nonlinear Optical Functions of Photonic Crystals for Ultralow-Power Photonic Processing, *Masay Notomi; NTT Basic Research Lab, Japan*

Giant Enhancement of Stimulated Brillouin Scattering in the Sub-wavelength Limit, *Peter T. Rakich, Sandia National Lab, USA*

Mid-IR Frequency Comb Based on Subharmonic GaAs OPO, *Konstantin Vodopyanov, Stanford Univ., USA*

SHORT COURSES

- SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*
- SC153 Quasi-Phasematching for Wavelength Conversion and All-Optical Nonlinear Processing, *Peter G. R. Smith; Univ. of Southampton, UK*
- SC163 Optical Parametric Oscillators, *Majid Ebrahim-Zadeh; ICFO, The Inst. of Photonics Science, Spain*
- SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*
- SC361 Coherent Mid-Infrared Sources and Applications, *Konstantin Vodopyonov; Stanford Univ., USA*

- SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*
- SC335 Super-Resolution Optical Microscopy, *Stephen Lane; Univ. of California at Davis, USA*
- SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*
- NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*
- NEW! SC378 Introduction to Ultrafast Optics, *Rick Trebino; Georgia Inst. of Technology, USA*

**CLEO: SCIENCE & INNOVATION 5:
TERAHERTZ TECHNOLOGIES AND
APPLICATIONS**

TUTORIAL SPEAKER

Waveguides for Pulsed Terahertz Radiation, *Daniel Mittleman; Rice Univ., USA*

INVITED SPEAKERS

Near-Infrared Metal Nanoantennas for Femtosecond Quantum Optics, *Rudolf Bratschitsch; Technical Univ. of Chemnitz, Germany*

Nonlinear THz Spectroscopy, High Field Generation, *Frank Hegmann; Univ. of Alberta, Canada*

Controlling Superconductivity with Strong Terahertz Fields, *Matthias Hoffman; Univ. of Hamburg – CFEL, Germany*

SHORT COURSES

- SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*
- SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA.*
- NEW! SC378 Introduction to Ultrafast Optics, *Rick Trebino; Georgia Inst. of Technology, USA*

**CLEO: SCIENCE & INNOVATIONS 6:
OPTICAL MATERIALS, FABRICATION
AND CHARACTERIZATION**

TUTORIAL SPEAKER

Nonlinear Optics in Crystalline and Amorphous Silicon-on-Insulator, *Roel Baets, Ghent Univ. - IMEC, Belgium*

INVITED SPEAKERS

Delayed Fluorescence by Reverse Intersystem Crossing and Applications to Organic Light-Emitting Diodes, *Kenichi Goushi; Kyushu Univ., Japan*

Nonlinear and Quantum Optics in Mesoscopic Photonic Lattices, *Chee Wei Wong; Columbia Univ., USA*

Trapping the Light Fantastic, *Diederik Wiersma; European Lab for Nonlinear Spectroscopy (LENIS) and CNR-INO Complex Photonics Group, Italy*

SHORT COURSES

- SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*
- SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*
- SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*
- NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

**CLEO: SCIENCE & INNOVATION 7:
MICRO- AND NANO-PHOTONIC DEVICES**

TUTORIAL SPEAKER

Hybrid III-V Semiconductor/Silicon Nanolaser, *Fabrice Raineri Laboratoire de Photonique et de Nanostructures- CNRS-Marcoussis, France*

INVITED SPEAKERS

Quantum Optics with Quantum Dots in Photonic Nanowires, *Jean-Michel Gerard; CEA/INAC/SP2M, France*

Hollow-core Photonics for Optofluidics and Atom Photonics, *Holger Schmidt; UC Santa Cruz, USA*

Microresonator-based Optical Frequency Combs, *Tobias Kippenberg; Ecole Polytechnique Federale de Lausanne (EPFL) and Max Planck Inst. of Quantum Optics (MPQ), Switzerland*

Optomechanical Crystals for Quantum Photon and Phonon Circuits, *Oskar Painter; California Inst. of Technology, USA*

Quantum Electrodynamics with Nanophotonic Devices, *Peter Lodahl; Univ. of Copenhagen, Denmark*

SHORT COURSES

- SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*
- SC182 Biomedical Optical Diagnostics and Sensing, *Sebastian Wachsmann-Hogiu, NSF, Univ. of California at Davis, USA*
- SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*
- SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*
- SC302 MetaMaterials, *Vladimir M. Shalaev; Purdue Univ., USA*
- SC362 Cavity Optomechanics: Fundamentals and Applications of Controlling and Measuring Nano- and Micro-mechanical Oscillators with Laser Light, *Tobia Kippenberg; Swiss Federal Inst. of Technology Lausanne, Switzerland*
- NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*
- NEW! SC379 Silicon Photonics, *Michal Lipson; Cornell Univ., USA*

**CLEO: SCIENCE & INNOVATION 8:
ULTRAFAST OPTICS, OPTOELECTRONICS
AND APPLICATIONS**

INVITED SPEAKERS

12-fs Ultra-broadband and Ultra-high-temporal Contrast NOPA System at 905 nm, *Jake Bromage; Univ. of Rochester, USA*

Reliable Carrier-Envelope Phase Control for Current and Future Attosecond Experiments, *Fabian Lucking; Femtolasers, Inc., USA*

Vector Soliton Control by Saturable Absorbers with Complex Recovery, *Oleg Okhotnikov; Optoelectronics Research Centre, Finland*

High Repetition Rate Frequency Combs: Ultrafast Optics Starting with Continuous-wave Lasers, *Andrew Weiner; Purdue Univ., USA*

SHORT COURSES

SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*

SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*

SC339 A Guide to Building Optical Frequency-comb-based Clocks for Ultralow Noise Signal Generation, *Scott Diddams, Chris Oates; NIST, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

NEW! SC377 Fundamentals of Lasers, *Randy A. Bartels; Colorado State Univ., USA*

NEW! SC378 Introduction to Ultrafast Optics, *Rick Trebino; Georgia Inst. of Technology, USA*

**CLEO: SCIENCE & INNOVATION 9:
COMPONENTS, INTEGRATION,
INTERCONNECTS AND SIGNAL
PROCESSING**

TUTORIAL SPEAKER

Single-chip Integrated Transmitters and Receivers, *Larry Coldren, Univ. of California Santa Barbara, USA*

INVITED SPEAKERS

Ultra-fast Photodetectors, *Bach Heinz-Gunter; Heinrich Hertz Inst., Germany*

The Foundry Model for Si Photonics – Technology, Opportunities, and Challenges, *Patrick (Guo-Qiang) Lo; Nano Electronics & Photonics, Inst. of Microelectronics, AStar, Singapore*

Silicon Photonic Integrated Circuits, *Subhal Sahnii; Luxtera Inc., USA*

SHORT COURSES

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

**CLEO: SCIENCE & INNOVATION 10:
BIOPHOTONICS AND OPTOFLUIDICS**

TUTORIAL SPEAKER

ePetri: High Resolution Lensless Microcopy Solution for Petri Dish Applications, *Changhuei Yang; Caltech, USA*

INVITED SPEAKERS

In Vivo Multi-Harmonic Generation Biopsy of Human Skin and Mucosa, *Chi-Kuang Sun; National Taiwan Univ., Taiwan*

Quantitative Phase Imaging in Biomedicine, *Gabriel Popescu; Univ. of Illinois, USA*

Integrated Lasers for Polymer Lab-on-a-Chip Systems, *Timo Mappes; Karlsruhe Inst. of Technology, Germany*

SHORT COURSES

SC149 Foundations of Nonlinear Optics, *Robert Fisher; R.A. Fisher Associates, USA*

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

SC182 Biomedical Optical Diagnostics and Sensing, *Sebastian Wachsman-Hogiu, NSF Center for Biophotonics Science and Technology, Univ. of California Davis, USA*

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*

SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*

SC335 Super-Resolution Optical Microscopy, *Stephen Lane; Univ. of California at Davis, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

**CLEO: SCIENCE & INNOVATION 11:
FIBER, FIBER AMPLIFIERS, LASERS
AND DEVICES**

TUTORIAL SPEAKER

Modelocked Fiber Lasers, Past Present and Future, *Martin Fermann; IMRA America Inc., USA*

INVITED SPEAKERS

Photonic Microcell: A Revival Tool for Gas Lasers, *Fetah Benabid; Xlim Research Institut, and Univ. of Bath, France*

Metamaterials Fabricated by Drawing, *Simon Fleming; Univ. Sydney, Australia*

Ultra-Low-Crosstalk Multi-Core Fiber Realizing Space-Division Multiplexed Ultra-Long-Haul Transmission, *Tetsuya Hayashi; Sumitomo Electric Industries, Ltd., Japan*

Stimulated Brillouin Scattering in Specialty Optical Fibers: Importance of Material, Structure and Manufacturing Parameters, *Yves Jaouen; Telecom ParisTech, France*

Modeling and Power Scaling of Carbon-Nanotube Mode-Locked Fiber Lasers, *Norihikon Nishizawa; Nagoya Univ., Japan*

SHORT COURSES

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

SC338 Fiber-Based Parametric Devices, *Colin J. McKinstrie; Bell Labs, Alcatel-Lucent, USA*

SC339 A Guide to Building Optical Frequency-comb-based Clocks for Ultralow Noise Signal Generation, *Scott Diddams, Chris Oates; NIST, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC377 Fundamentals of Lasers, *Randy A. Bartels; Colorado State Univ., USA*

**CLEO: SCIENCE & INNOVATION 12:
LIGHTWAVE COMMUNICATIONS AND
OPTICAL NETWORKS**

TUTORIAL SPEAKER

Modulation and Coding Techniques, and Optical Networking Technologies Enabling Multi-Tb/s Bandwidth Delivery, *Milorad Cvijetic; Univ. of Arizona, USA*

INVITED SPEAKERS

Design and Modeling of Novel Fibers for Space Division Multiplexing, *John Fini; OFS Labs, USA*

The Age of Optical Coherent Communication, *Kuang-Tsan Wu; Infinera, Canada*

SHORT COURSES

SC147 Optical Fiber Communication Systems, *Alan Willner; Univ. of Southern California, USA*

**CLEO: SCIENCE & INNOVATION 13:
ACTIVE OPTICAL SENSING**

TUTORIAL SPEAKER

Frequency Comb Spectroscopy from Mid-Infrared to Extreme Ultraviolet, *Jun Ye; NIST and Univ. of Colorado, USA*

INVITED SPEAKERS

Photochemical Microreactors in Photonic Crystal Fibers, *Ana Cubillas; Max Planck Inst. for the Science of Light, Germany*

Realization of Nano-Strain-Resolution Fiber Optic Static Strain Sensor for Geo-Science Applications, *Zuyuan (Joey) He; Univ. of Tokyo, Japan*

SHORT COURSES

SC182 Biomedical Optical Diagnostics and Sensing, *Sebastian Wachsman-Hogiu, NSF, Univ. of California at Davis, USA*

SC200 Laser Remote Sensing, *Timothy Carrig and Philip Gatt; Lockheed Martin, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

SC361 Coherent Mid-Infrared Sources and Applications, *Konstantin Vodopyonov; Stanford Univ., USA*

NEW! SC375 Applications of Mid-Infrared Quantum Cascade Lasers in Health and the Environment, *Yamac Dikmelik; Department of Electrical and Computer Engineering, Johns Hopkins Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

**CLEO: SCIENCE & INNOVATION 14:
OPTICAL METROLOGY**

TUTORIAL SPEAKER

Ultra-Stable Cavities, *Mark Notcutt; Stable Lasers Systems, USA*

INVITED SPEAKERS

New Determination of the Fine Structure Constant and Test of Quantum Electrodynamics, *Rym Bouchendira; Laboratoire Kastler Brossel, Université Pierre et Marie Curie, Ecole Normale Supérieure et CNRS, France*

Towards a Nuclear Optical Clock, *Corey Campbell; Georgia Tech, USA*

Octave-Spanning Combs on a Chip, *Alexander Gaeta; Cornell Univ., USA*

SHORT COURSES

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

SC339 A Guide to Building Optical Frequency-comb-based Clocks for Ultralow Noise Signal Generation, *Scott Diddams, Chris Oates; NIST, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC378 Introduction to Ultrafast Optics, *Rick Trebino; Georgia Inst. of Technology, USA*

**CLEO: SCIENCE & INNOVATION 15:
LEDS, PHOTOVOLTAICS AND ENERGY-
EFFICIENT (“GREEN”) PHOTONICS**

TUTORIAL SPEAKER

Solar Energy Technologies Tutorial, *Ryne Raffaele; Rochester Inst. of Technology, USA*

INVITED SPEAKERS

GaN Based Nanorod Technology for Solid State Lighting, *Andreas Waag; TU Braunschweig, Germany*

Photonics with Graphene and Carbon nanotubes, *Andrea Ferrari; Univ. of Cambridge, UK*

SHORT COURSES

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*

SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

CLEO: APPLICATIONS & TECHNOLOGY 1: BIOMEDICAL**TUTORIAL SPEAKER**

Image-Guided Spectroscopy of Cancer: Translating Optical Technology into Clinical Tools, *Brian W. Pogue; Dartmouth College, USA*

INVITED SPEAKERS

Title to be Announced, *David Benaron; Spectros Corporation, USA*

Full-Field OCT (FF-OCT): From A Lab Bench to a Valuable Hospital Tool?, *A. Claude Boccara; Institut Langevin ESPCI-ParisTech, France*

Title to be Announced, *Brett Bouma; Wellman Center for Photomedicine, Massachusetts General Hospital, USA*

Coherence Imaging for Early Cancer Detection, *Adam Wax; Dept of Biomedical Engineering, Duke Univ., USA*

SHORT COURSES

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

SC182 Biomedical Optical Diagnostics and Sensing, *Sebastian Wachsmann-Hogiu, NSF, Univ. of California at Davis, USA*

SC200 Laser Remote Sensing, *Timothy Carrig and Philip Gatt; Lockheed Martin, USA*

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*

SC270 High Power Fiber Lasers and Amplifiers, *W. Andrew Clarkson; Optoelectronics Res. Ctr., Univ. of Southampton, UK*

SC335 Super-Resolution Optical Microscopy, *Stephen Lane; Univ. of California at Davis, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

CLEO: APPLICATIONS & TECHNOLOGY 2: ENVIRONMENT/ENERGY**INVITED SPEAKERS**

Atmospheric Volatile Organic Compound Sensing with Lasers, *Frank Keutsch; Univ. of Wisconsin, USA*

Green LEDs and Solar Cells based on ZnTe-related Materials, *Tooru Tanaka; Saga Univ., Japan*

Hydrogen Generation using Nitride Photoelectrodes, *Kazuhiro Ohkawa; Tokyo Univ. of Science, Japan*

III-Nitride Optochemical Nanosensors, *Martin Eickhoff; Physikalisches Institut Justus Liebig Univ., Giessen, Germany*

SHORT COURSES

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

SC182 Biomedical Optical Diagnostics and Sensing, *Sebastian Wachsmann-Hogiu, NSF Center for Biophotonics Science and Technology, Univ. of California Davis, USA*

SC200 Laser Remote Sensing, *Timothy Carrig and Philip Gatt; Lockheed Martin, USA*

SC221 Nano-Photonics: Physics and Techniques, *Axel Scherer; Caltech, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

SC335 Super-Resolution Optical Microscopy, *Stephen Lane; Univ. of California at Davis, USA*

CLEO: APPLICATIONS & TECHNOLOGY 3: GOVERNMENT & NATIONAL SCIENCE, SECURITY & STANDARDS APPLICATIONS**TUTORIAL SPEAKER**

Enabling Science at the Advanced Light Source X-Ray Facility, *Roger Falcone; Lawrence Berkeley National Lab (LBNL); USA*

INVITED SPEAKERS

Applications of Ultrafast Lasers, *Mike M. Mielke; Raydiance Inc., USA*

Non Distractive Remote Inspection for Heavy Construction, *Masayuki Fujita; Inst. for Laser Technology, Osaka, Japan*

SHORT COURSES

SC157 Laser Beam Analysis, Propagation and Shaping Techniques, *James R. Leger; Univ. of Minnesota, USA*

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NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

CLEO: APPLICATIONS & TECHNOLOGY 4: INDUSTRIAL**INVITED SPEAKERS**

Title to be Announced, *Rick Gilner; Fraunhofer Inst., Germany*

Title to be Announced, *Rick Russo; Lawrence Berkeley National Lab, USA*

Laser-Based Synthesis of Nanomaterials in the Solid State, *Alberto Salleo; Stanford Univ., USA*

Inline Coherent Imaging: Measuring and Controlling Depth in Industrial Laser Processes, *Paul J. L. Webster; Queen's Univ., Canada*

SHORT COURSES

SC200 Laser Remote Sensing, *Timothy Carrig and Philip Gatt; Lockheed Martin, USA*

SC352 Ultrafast Laser Shaping and Pulse Compression, *Marcos Dantus; Michigan State Univ., USA*

NEW! SC376 Plasmonics, *Mark Brongersma; Univ. of Stanford, USA*

Note: Invited Speakers, Short Courses, and Tutorials are as of 15 December 2011. Visit www.cleoconference.org/ info for updates.

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