

CLEO: 2014 Subject Index

A&T 1: Biomedical

Technical Sessions

AM2O, Endoscopy & Minimally Invasive Optical Imaging, Monday, 10:30-12:30page 65

ATu1P, Applications of Optical Microscopy and Imaging, Tuesday, 11:00-13:00page 101

AW1L, Imaging and Sensing, Wednesday, 10:30-12:30page 144

AW3L, Microscopy, Wednesday, 16:30-18:30page 164

ATh1O, OCT-Technology Development & Clinical Applications, Thursday, 08:00-10:00page 177

Tutorial

AW1L.1, Multimode Optical Bioimaging, from the Lab to the Clinic: A Translational Story, Daniel Farkas, *Univ. of Southern California, USA*, Wednesday, 10:30-11:30page 144

Invited

AM2O.1, Mueller Polarimetric Endoscopy, Daniel Elson, *Imperial College London, UK*, Monday, 10:30-11:00page 65

AM2O.4, Methods for Enhancing Visualization of Subsurface Tissue Structures in Real Time, Stavros Demos, *Lawrence Livermore National Lab, USA*, Monday, 11:30-12:00page 69

ATu1P.1, Increasing the Diagnostic Yield and Accuracy of Bronchial Biopsy for the Assessment of Lung Cancer, Melissa Suter, *Harvard Medical School, Mass General Hos, USA*, Tuesday, 11:00-11:30page 101

ATu1P.3, In vivo Imaging of Nanoparticle Delivery and Tumor Microvasculature with Multimodal Optical Coherence Tomography, Melissa Skala, *Vanderbilt Univ., USA*, Tuesday, 11:45-12:15page 105

ATu1P.5, Searching for Biomarkers of Glaucoma using Adaptive Optics Scanning Ophthalmoscopy, Alfredo Dubra, *Medical College of Wisconsin, USA*, Tuesday, 12:30-13:00page 109

AW3L.3, Photoacoustic Microscopy: Current Situation and New Ultrasonic Detectors, Hao Zhang, *Northwestern Univ., USA*, Wednesday, 17:00-17:30page 164

ATh1O.1, Progress on Cellular Resolution Retinal Imaging: Setting the Stage for Translation between Clinical and Basic Science, Robert Zawadzki, *Univ. of California Davis, Univ. of California Davis, USA*, Thursday, 08:00-08:30page 177

Short Courses

SC221: Nano Photonics: Physics and Techniques, Axel Scherer, *Caltech, USA*, Sunday, 08:30-12:30page 19

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

A&T 2: Environment & Energy

Technical Sessions

AF1P, Photons for Environment, Friday, 08:00-10:00page 221

AF2P, Photons for Energy, Friday, 10:30-12:30page 233

Invited

AF1P.1, Frontiers of Eco-Efficient Ultraviolet Water Treatment Technologies, D. Knight, *Trojan Technologies Inc., Canada*, Friday, 08:00-08:30page 221

AF2P.4, High Efficiency Solar Building Envelopes for Integrated Delivery of Environmental Control Systems, Anna Dyson, *Rensselaer Polytechnic Institute, USA*, Friday, 11:30-12:00page 237

Short Courses

SC221: Nano Photonics: Physics and Techniques, Axel Scherer, *Caltech, USA*, Sunday, 8:30-12:30page 19

SC301: Quantum Cascade Lasers: Science, Technology, Applications and Markets, Federico Capasso, *Harvard Univ., USA*, Monday, 12:30-16:30page 22

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

A&T 3: Government & National Science, Security & Standards Applications

Technical Sessions

AW1P, Spectroscopy and Imaging Applications, Wednesday, 10:30-12:30page 145

AW3P, Novel Optical Devices, Wednesday, 16:30-18:30page 165

Invited

AW1P.3, Ultrafast X-ray Absorption Spectroscopy using Superconducting Microcalorimeter Sensors, Joel Ullom, *NIST, USA*, Wednesday, 11:00-11:30page 149

AW1P.6, Infrared Digital Holography as New 3D Imaging Tool for First Responders and Firefighters: Recent Achievements and Perspectives, Pietro Ferraro, *Istituto Nazionale di Ottica, Italy*, Wednesday, 12:00-12:30page 153

AW3P.1, Nanowire Superconducting Single Photon Detectors Progress and Promise, Sae Woo Nam, *NIST, USA*, Wednesday, 16:30-17:00page 165

AW3P.4, Quantum Noise Reduction in the LIGO Gravitational Wave Interferometer with Squeezed States of Light, Lisa Barsotti, *MIT, USA*, Wednesday, 17:30-18:00page 169

Short Courses

SC301: Quantum Cascade Lasers: Science, Technology, Applications and Markets, Federico Capasso, *Harvard Univ., USA*, Monday, 12:30-16:30page 22

- SC318: Coherent and Incoherent Laser Beam Combining: Theory and Methods**, James Leger, *Univ. of Minnesota, USA*, Sunday, 13:30-17:30page 19
- SC339: Optical Atomic Clocks: New Science and Technology**, Scott Diddams, Chris Oats, *NIST, USA*, Sunday, 08:30-11:30page 18
- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

A&T 4: Industrial

Technical Sessions

- AM1L, Advanced Material Processing**, Monday, 08:00-10:00page 52
- AM2L, Innovative Laser Sources Detectors and Beam Delivery**, Monday, 10:30-12:30page 64
- AW1H, Material Structuration for Next Generation Sensors and Components**, Wednesday, 10:30-12:30page 143
- AW3H, High Performance Optical Measurement**, Wednesday, 16:30-18:30page 163

Invited

- AM1L.1, Innovative Applications of Femtosecond Laser Induced Nanostructure**, Yasuhiko Shimotsuma, *Kyoto Univ., Japan*, Monday, 08:00-08:30page 52
- AM1L.6, Ultra-short Pulse Lasers as Versatile Tools in the Fabrication of Medical Micro Implants**, Nils-Agne Feth, *Admedes Schuessler GmbH, Germany*, Monday, 09:30-10:00page 60
- AM2L.5, Ultrafast Beam Modulation and Delivery for Printing and Embossing Applications**, Guido Hennig, *Daetwyler Graphics AG, Switzerland*, Monday, 11:30-12:00page 68
- AW1H.4, Ultrafast Laser Writing of Advanced Guided Wave Communications Components**, Nicholas Psaila, *Heriot-Watt Univ., UK*, Wednesday, 11:30-12:00page 147

Short Courses

- SC270: High Power Fiber Lasers and Amplifiers**, W. Andrew Clarkson, *Optoelectronics Res. Ctr., Univ. of Southampton, UK*, Monday, 12:30-16:30page 21
- SC301: Quantum Cascade Lasers: Science, Technology, Applications and Markets**, Federico Capasso, *Harvard Univ., USA*, Monday, 12:30-16:30page 22
- SC318: Coherent and Incoherent Laser Beam Combining: Theory and Methods**, James Leger, *Univ. of Minnesota, USA*, Sunday, 13:30-17:30page 19
- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

FS 1: Quantum Optics of Atoms, Molecules and Solids

Technical Sessions

- FW1B, Spin Coherence in Color Centers in Diamond**, Wednesday, 10:30-12:30page 142
- FW3B, Advances in Quantum Optics Platforms**, Wednesday, 16:30-18:30page 162
- FTh1B, Quantum Interconnects**, Thursday, 08:00-10:00page 174
- FTh3B, Quantum Optics with Atoms and Ions**, Thursday, 14:00-16:00page 194
- FF1A, Coherent Effects with Quantum Dots**, Friday, 08:00-10:00page 218
- FF2A, Quantum Memories**, Friday, 10:30-12:15page 230

Tutorial

- FTh1B.1, Strong Photon-Photon Interactions**, Vladan Vuletic, *MIT, USA*, Thursday, 08:00-09:00page 174

Invited

- FW1B.5, Quantum Information and Networks with Spins in Diamond**, Tim Tamirniau, *Technische Universiteit Delft, Netherlands*, Wednesday, 11:30-12:00page 146
- FTh3B.3, Building Quantum Networks with Ions in Optical Cavities**, Tracy Northup, *Univ. of Innsbruck, Austria*, Thursday, 14:30-15:00page 194
- FF2A.1, Quantum State Engineering for High Efficiency Quantum Memories and Cavity Line Narrowing**, Stefan Kröll, *Lund Univ., Sweden*, Friday, 10:30-11:00page 230

Short Courses

- SC302: MetaMaterials**, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 08:30-11:00page 18
- SC339: Optical Atomic Clocks: New Science and Technology**, Scott Diddams¹, Chris Oats¹, *NIST, USA*, Sunday, 08:30-11:30page 18
- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26
- SC376: Plasmonics**, Mark Brongersma, *Stanford Univ., USA*, Sunday, 14:00-17:00page 22
- SC402: Transformational Optics**, Ulf Leonhardt, *Weizmann Inst. of Science in Israel, Israel*, Monday, 13:00 -16:00page 23
- SC403: NanoCavity Quantum Electrodynamics and Applications**, Jelena Vuckovic, *Stanford Univ., USA*, Sunday, 14:00-17:00page 21

FS 2: Quantum Science, Engineering and Technology

Technical Sessions

- FM1A, Quantum Engineering**, Monday, 08:00-10:00page 50
- FM2A, Quantum Logic and Interference**, Monday, 10:30-12:30page 62
- FM3A, Quantum Detection**, Monday, 13:30-15:30page 74
- FM4A, Quantum Key Distribution**, Monday, 16:00-18:00page 86

FTu3A, Quantum Repeater Technologies , Tuesday, 16:30-18:30	page 122
FW1A, Fundamental Quantum Science , Wednesday, 10:30-12:30	page 142
FW3A, Single Photon and Photon Pair Sources , Wednesday, 16:30-18:30	page 162
FTh1A, Quantum Entanglement , Thursday, 08:00-10:00	page 174
FTh3A, Nonclassical States and Quantum Phenomena , Thursday, 14:00-16:00	page 194
FTh4A, Quantum Sensing and Metrology , Thursday, 16:30-18:30	page 206
Tutorial	
FM1A.1, Quantum Optomechanics , Markus Aspelmeyer, <i>Universitat Wien, Austria</i> , Monday, 08:00-09:00	page 50
Invited	
FM2A.5, Quantum Information Processing with Photons , Yao Chen, <i>Shanghai Branch, National Lab for Physical Sciences at Microscale and Department of Modern Physics, Univ. of Science and Technology of China, China</i> , Monday, 11:30-12:00	page 66
FTu3A.1, Atoms, Ions and Photons for Quantum Tasks: Strengths and Weaknesses , Julio Barreiro, <i>Univ. of California, San Diego, USA</i> , Tuesday, 16:30-17:00	page 122
Short Courses	
SC221: Nano Photonics: Physics and Techniques , Axel Scherer, <i>Caltech, USA</i> , Sunday, 08:30-12:30	page 19
SC271: Quantum Information--Technologies and Applications , Greg Kanter ¹ , Paul Toliver ² , ¹ NuCrypt, ² Applied Communication Sciences, <i>USA</i> , Tuesday, 13:00-16:00	page 25
SC301: Quantum Cascade Lasers: Science, Technology, Applications and Markets , Federico Capasso, <i>Harvard Univ., USA</i> , Monday, 12:30-16:30	page 22
SC302: MetaMaterials , Vladimir M. Shalaev, <i>Purdue Univ., USA</i> , Sunday, 08:30-11:00	page 18
SC352: Introduction to Ultrafast Pulse Shaping— Principles and Applications , Marcos Dantus, <i>Michigan State Univ., USA</i> , Tuesday, 13:00-16:00	page 26
SC362: Cavity Optomechanics: Fundamentals and Applications of Controlling and Measuring Nano- and Micro-mechanical Oscillators with Laser Light , Tobias Kippenberg, <i>Ecole Polytechnique Federale de Lausanne, Switzerland</i> , Tuesday, 09:00-12:00	page 23
SC376: Plasmonics , Mark Brongersma, <i>Stanford Univ., USA</i> , Sunday, 13:00-16:00	page 22
SC402: Transformational Optics , Ulf Leonhardt, <i>Weizmann Inst. of Science in Israel, Israel</i> , Monday, 13:00-16:00	page 23
SC403: NanoCavity Quantum Electrodynamics and Applications , Jelena Vuckovic, <i>Stanford Univ., USA</i> , Sunday, 14:00-17:00	page 21

FS 3: Metamaterials and Complex Media

Technical Sessions

FM1C, Hyperbolic and Epsilon-near-zero Materials , Monday, 08:00-10:00	page 50
FM2C, Optics in Random Media I , Monday, 10:30-12:30	page 62
FM3C, Optics in Random Media II , Monday, 13:30-15:30	page 74
FM4C, Novel Optics I , Monday, 16:00-18:00	page 86
FTu1C, Novel Optics II , Tuesday, 11:00-13:00	page 98
FTu2C, Novel Anisotropic Structures , Tuesday, 14:00-16:00	page 110
FTu3C, Quantum Meta Optics , Tuesday, 16:30-18:30	page 122
FF1C, Metasurfaces I , Friday, 08:00-10:00	page 218
FF2C, Metasurfaces II , Friday, 10:30-12:30	page 230

Tutorial

FF1C.1, Spin-Optical Metasurface Route to Spin- Controlled Photonics , Erez Hasman, <i>Technion-Israel Institute of Technology, Israel</i> , Friday, 08:00-09:00	page 218
---	----------

Invited

FM2C.5, Densities of States, Dynamics and Intensity Profiles of Transmission Eigenchannels of Opaque Media , Azriel Genack, <i>CUNY Queens College, USA</i> , Monday, 11:30-12:00	page 66
FM3C.1, Coherent Control of Total Transmission of Light through Disordered Media , Hui Cao, <i>Yale Univ., USA</i> , Monday, 13:30-14:00	page 74
FTu1C.1, Planar Superconducting Toroidal Metamaterial: A Source for Oscillating Vector-Potential? , Vassili Savinov, <i>Univ. of Southampton, UK</i> , Tuesday, 11:00-11:30	page 98
FTu3C.3, Thermal Emission Control with Surface Waves , Jean-Jacques Greffet, <i>Institut d'Optique, France</i> , Tuesday, 17:00-17:30	page 122

Short Courses

SC221: Nano Photonics: Physics and Techniques , Axel Scherer, <i>Caltech, USA</i> , Sunday, 08:30-12:30	page 19
SC302: MetaMaterials , Vladimir M. Shalaev, <i>Purdue Univ., USA</i> , Sunday, 08:30-11:00	page 18
SC376: Plasmonics , Mark Brongersma, <i>Stanford Univ., USA</i> , Sunday, 13:00-16:00	page 22
SC396: Frontiers of Guided Wave Nonlinear Optic , Ben Eggleton, <i>Univ. of Sydney, Australia</i> , Sunday, 13:30-17:30	page 20
SC402: Transformational Optics , Ulf Leonhardt, <i>Weizmann Inst. of Science in Israel, Israel</i> , Monday, 13:00-16:00	page 23

FS 4: Optical Interactions with Condensed Matter and Ultrafast Phenomena

Technical Sessions

- FM3B, Quantum Fluids and Gases in Solids**, Monday, 13:30-15:30page 74
- FM4B, Dynamics in Strongly Correlated Materials**, Monday, 16:00-18:00page 76
- FTu1B, Dynamics in Semiconductor Quantum Wells**, Tuesday, 11:00-13:00page 98
- FTu2B, Optical Properties of Low-Dimensional Materials**, Tuesday, 14:00-16:00page 110
- FTh1C, High-Field THz Physics**, Thursday, 08:00-10:00page 174
- FTh3C, Low Energy Dynamics in Dirac Materials**, Thursday, 14:00-16:00page 194
- FTh4C, Carrier Dynamics in 0-D and 1-D Nanostructures**, Thursday, 16:30-18:30page 206

Tutorial

- FM3B.1, Quantum fluids of light**, Cristiano Ciuti, *Université Paris Diderot, USA*, Monday, 13:30-14:30page 74

Invited

- FTu2B.4, Optoelectronics of 2D-Semiconductors**, Xiadong Xu, *Univ. of Washington, USA*, Tuesday, 14:45-15:15page 114
- FTh1C.1, CEP Control of Dynamical Bloch Oscillations in a Bulk Semiconductor via Ultra-Intense Multi-THz Fields**, Fabian Langer, *Univ. of Regensburg, Germany*, Thursday, 08:00-08:30page 174
- FTh3C.5, Observation of Floquet-Bloch States on the Surface of a Topological Insulator**, Nuh Gedik, *MIT, USA*, Thursday, 15:00-15:30page 198

Short Courses

- SC149: Foundations of Nonlinear Optics**, Robert Fisher, *R. A. Fisher Associates, USA*, Sunday, 08:30-12:30 ...page 19
- SC302: MetaMaterials**, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 08:30-11:00page 18
- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26
- SC376: Plasmonics**, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22
- SC378: Introduction to Ultrafast Optics**, Rick Trebino, *George Institute of Technology, USA*, Sunday, 13:30-17:30page 20
- SC396: Frontiers of Guided Wave Nonlinear Optic**, Ben Eggleton, *Univ. of Sydney, Australia*, Sunday, 13:30-17:30page 20

FS 5: Nonlinear Optics and Novel Phenomena

Technical Sessions

- FM1D, PT Symmetry and Related Phenomena**, Monday, 08:00-10:00page 50
- FM2D, Graphene and Novel Phenomena**, Monday, 10:30-12:30page 62
- FM3D, Nonconventional Beams and Applications**, Monday, 13:30-15:30page 74
- FM4D, Accelerating Beams**, Monday, 16:00-18:00 . .page 86
- FTu3D, Filamentation and the THz Generation**, Tuesday, 16:30-18:30page 122
- FW1D, Wavelength Conversion in Micro-Structures**, Wednesday, 10:30-12:30page 142
- FW3D, Spatio-Temporal Dynamics**, Wednesday, 16:30-18:30page 162
- FTh1D, Solitons and Temporal Effects**, Thursday, 08:00-10:00page 174
- FTh3D, Novel Optical Phenomena**, Thursday, 14:00-16:00page 194
- FTh4D, Nonlinear Metamaterials and Cooling**, Thursday, 16:30-18:30page 206
- FF1D, Entangled Photons and Quantum Effects**, Friday, 08:00-10:00page 218
- FF2D, Quantum Effects in Lattices**, Friday, 10:30-12:30page 230

Tutorial

- FM4D.1, Self Accelerating Beams of Photons and Electrons**, Ady Arie, *Tel-Aviv Univ., Israel*, Monday, 16:00-17:00page 86

Invited

- FM2D.1, Optical Phenomena in Graphene/Boron Nitride Heterostructures**, Feng Wang, *Univ. of California Berkeley; Lawrence Berkeley National Lab, USA*, Monday, 10:30-11:00page 62
- FW1D.1, Vacuum UV to IR supercontinuum generation by impulsive Raman self-scattering in hydrogen-filled PCF**, Federico Belli, *Max Planck Institute, Germany*, Wednesday, 10:30-11:00page 142
- FTh4D.1, Inducing Giant Nonreciprocal Effects in Metamolecules, Metasurfaces and Metamaterials**, Andrea Alu, *Univ. of Texas at Austin, USA*, Thursday, 16:30-17:00page 206
- FTh4D.2, Phase Mismatch-Free Nonlinear Propagation in Optical Zero-Index Materials**, Kevin O'Brien, *Univ. of California Berkeley, USA*, Thursday, 17:00-17:30 ...page 206
- FF2D.1, Realization of the Harper Hamiltonian with Ultracold Atoms in Optical Lattices**, Hirokazu Miyake, *MIT, USA*, Friday, 10:30-11:00page 230

Short Courses

- SC149: Foundations of Nonlinear Optics**, Robert Fisher, *R. A. Fisher Associates, USA*, Sunday, 08:30-12:30 ...page 19
- SC302: MetaMaterials**, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 08:30-11:00page 18
- SC339: Optical Atomic Clocks: New Science and Technology**, Scott Diddams, Chris Oats, *NIST, USA*, Sunday, 08:30-11:30page 18

- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26
- SC376: Plasmonics**, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22
- SC396: Frontiers of Guided Wave Nonlinear Optic**, Ben Eggleton, *Univ. of Sydney, Australia*, Sunday, 13:30-17:30page 20
- SC403: NanoCavity Quantum Electrodynamics and Applications**, Jelena Vuckovic, *Stanford Univ., USA*, Sunday, 14:00-17:00page 21

FS 6: Nano-Optics and Plasmonics

Technical Sessions

- FM1K, Applications of Localized Surface Plasmons**, Monday, 08:00-10:00page 52
- FM2K, Plasmonic Nanoantennas**, Monday, 10:30-12:30page 64
- FM3K, Plasmonic Biochemical Sensors and Systems**, Monday, 13:30-15:30page 76
- FM4K, Localized Plasmon Enhanced Sensing: SERS, SEIRA**, Monday, 16:00-18:00page 88
- FTu1K, Near-field Imaging with Photons, Plasmons and Electrons**, Tuesday, 11:00-13:00page 100
- FTu2K, Plasmonic Waveguides, Lenses, and Circuits**, Tuesday, 14:00-16:00page 112
- FTu3K, Active Plasmonic and Nanophotonic Modulators**, Tuesday, 16:30-18:30page 124
- FW1K, Metasurfaces and Plasmonic Metamaterials**, Wednesday, 10:30-12:30page 144
- FW3K, Devices Enabled by Nano-Optics and Plasmonics**, Wednesday, 16:30-18:30page 164
- FTh1K, Optomechanics and Optical Manipulation**, Thursday, 08:00-10:00page 176
- FTh3K, Plasmonic Lasers and Amplification**, Thursday, 14:00-16:00page 196
- FTh4K, Nonlinear Plasmonics: From Visible to Terahertz**, Thursday, 16:30-18:30page 208
- FF1K, Photonic Crystals and Complex Plasmonic Nanostructures**, Friday, 08:00-10:00page 220
- FF2K, Nanophotonic and Plasmonic Coupling to Quantum Emitters**, Friday, 10:30-12:30page 232

Tutorial

- FW1K.1, Optical Properties on Demand: Reconfigurable and Coherently Controlled Metamaterials**, Nikolay Zheludev, *Univ. of Southampton, NTU, UK*, Wednesday, 10:30-11:30page 144

Invited

- FM1K.1, Coherent Plasmonics: Optimized for Sensing and Energy Transfer**, Naomi Halas, *Rice Univ., USA*, Monday, 08:00-08:30page 52
- FM3K.1, Plasmonic Biosensors and Their Analytical Applications**, Jiri Homola, *Institute of Photonics and Electronics, Czech Republic*, Monday, 13:30-14:00page 76

- FM4K.1, Plasmonics: Quantum on the Angstrom Scale, as Observed by Surface-enhanced Raman Scattering**, Wenqi Zhu, *Harvard Univ., USA*, Monday, 16:00-16:30page 88
- FW3K.1, Transparent Displays Enabled by Resonant Nanoparticle Scattering**, Chia Wei Hsu, *MIT; Harvard Univ., USA*, Wednesday, 16:30-17:00page 164
- FTh1K.1, 3D Optical Manipulation of a Single 50 Nm Particle with a Scanning Evanescent Nano-Tweezers**, Johann Berthelot, *ICFO, Spain*, Thursday, 08:00-08:30page 176
- FTh3K.3, Highly-directional Plasmonic Lasing in the Visible with Subwavelength Hole Arrays**, Xiangeng Meng, *Purdue Univ., USA*, Thursday, 14:30-15:00page 196

Short Courses

- SC221: Nano Photonics: Physics and Techniques**, Axel Scherer, *Caltech, USA*, Sunday, 08:30-12:30page 19
- SC302: MetaMaterials**, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 08:30-11:00page 18
- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26
- SC376: Plasmonics**, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22
- SC402: Transformational Optics**, Ulf Leonhardt, *Weizmann Inst. of Science in Israel, Israel*, Monday, 13:00-16:00page 23
- SC403: NanoCavity Quantum Electrodynamics and Applications**, Jelena Vuckovic, *Stanford Univ., USA*, Sunday, 14:00-17:00page 21
- SC410: Finite Element Modeling Methods for Photonics and Optics**, Arti Agrawal, *City Univ., UK*, Tuesday, 09:00-12:00page 24

FS 7: High-Field Physics and Attosciences

Technical Sessions

- FM1B, Relativistic Laser-Plasma Interactions**, Monday, 08:00-10:00page 50
- FM2B, New Trends in Attoscience**, Monday, 10:30-12:30page 62
- FTu1D, Strong-Field Physics**, Tuesday, 11:00-13:00page 98
- FTu2D, Novel XUV/X-Ray Sources**, Tuesday, 14:00-16:00page 110
- FTu3B, Advances in High-Harmonic Generation**, Tuesday, 16:30-18:30page 122

Tutorial

- FTu1D.1, Approaching the Atomic Unit of Time with Isolated Attosecond Pulses**, Zenghu Chang, *Univ. of Central Florida, CREOL, USA*, Tuesday, 11:00-12:00page 98

Invited

- FM1B.1, High energy ion acceleration and neutron production using relativistic transparency in solids**, Markus Roth, *Technische Universität Darmstadt, Germany*, Monday, 08:00-08:30page 50

FTu2D.1, Lightwave control of plasma mirrors, Rodrigo Lopez-Martens, *ENSTA ParisTech, Ecole Polytechnique, CNRS UMR 7639, France*, Tuesday, 14:00-14:30page 110

Short Courses

SC302: MetaMaterials, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 08:30-11:00page 18

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

SC362: Cavity Optomechanics: Fundamentals and Applications of Controlling and Measuring Nano- and Micro-mechanical Oscillators with Laser Light, Tobias Kippenberg, *Ecole Polytechnique Federale de Lausanne, Switzerland*, Tuesday, 09:00-12:00page 23

SC376: Plasmonics, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22

SC378: Introduction to Ultrafast Optics, Rick Trebino, *George Institute of Technology, USA*, Sunday, 13:30-17:30page 20

S&I 1: Light-Matter Interactions and Materials Processing

Technical Sessions

STh1J, Structuring Materials with fs Lasers, Thursday, 08:00-10:00page 176

STh4B, Laser-Driven Dynamics in Materials, Thursday, 16:30-18:30page 206

SF1J, Laser Initiated Self-organization & Patterning, Friday, 08:00-10:00page 220

SF2J, Innovations in Laser Processing of Materials, Friday, 10:30-12:30page 232

Tutorial

STh1J.1, Femtosecond Laser Materials Processing, Chunlei Guo, *Univ. of Rochester, USA*, Thursday, 08:00-09:00page 176

Invited

STh4B.1, Ultrafast Electron Dynamics in Photo-excited Semiconductors Studied by Time and Angle-resolved Two Photon Photoelectron Spectroscopy, Junichi Kanasaki, *Osaka Univ., Japan*, Thursday, 16:30-17:00page 206

SF2J.3, 3D Chemical Imaging of Li-Ion Batteries using Femtosecond Laser Plasma Spectroscopy, Vassilia Zorba, *Lawrence Berkeley National Lab, USA*, Friday, 11:00-11:30page 232

Short Courses

SC149: Foundations of Nonlinear Optics, Robert Fisher, *R. A. Fisher Associates, USA*, Sunday, 08:30-12:30page 19

SC318: Coherent and Incoherent Laser Beam Combining: Theory and Methods, James Leger, *Univ. of Minnesota, USA*, Sunday, 13:30-17:30page 19

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

SC376: Plasmonics, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22

S&I 2: Solid-State, Liquid, Gas, and High-Intensity Lasers

Technical Sessions

SM1F, Solid State Laser Systems for Secondary Source Generation, Monday, 08:00-10:00page 51

SM3F, Advanced Laser Materials, Monday, 13:30-15:30page 75

SM4F, Diode Pumped Mode-locked Oscillators and Amplifiers, Monday, 16:00-18:00page 87

STu1O, High Average Power Lasers for Industrial Applications, Tuesday, 11:00-13:00page 101

STu3F, Technologies for High Intensity, Tuesday, 16:30-18:30page 123

Tutorial

STu1O.1, Laser Additive Manufacturing LAM - Fundamentals of Selective Laser Melting SLM and Laser Material Deposition LMD, Reinhart Poprawe, *Fraunhofer Institut, Germany*, Tuesday, 11:00-12:00page 101

Invited

SM1F.1, Cryogenic Composite Disk Laser for Peak and Average Power Scaling, Luis Zapata, *MIT; Deutsches Elektronen Synchrotron, USA*, Monday, 08:00-08:30page 51

SM1F.4, 1 Joule, 100 Hz Repetition Rate, Picosecond CPA Laser for Driving High Average Power Soft X-Ray Lasers, Brendan Reagan, *Colorado State Univ., USA*, Monday, 09:00-09:30page 55

STu3F.1, High Repetition Rate kJ-class Nanosecond to Femtosecond Lasers, Todd Ditmire, *Univ. of Texas at Austin, USA*, Tuesday, 16:30-17:00page 123

Short Courses

SC149: Foundations of Nonlinear Optics, Robert Fisher, *R. A. Fisher Associates, USA*, Sunday, 8:30-12:30page 19

SC270: High Power Fiber Lasers and Amplifiers, W. Andrew Clarkson, *Optoelectronics Res. Ctr., Univ. of Southampton, UK*, Monday, 12:30-16:30page 21

SC302: MetaMaterials, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 8:30-11:00page 18

SC318: Coherent and Incoherent Laser Beam Combining: Theory and Methods, James Leger, *Univ. of Minnesota, USA*, Sunday, 13:30-17:30page 19

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

S&I 3: Semiconductor Lasers

Technical Sessions

SW1G, Emerging Trends in Semiconductor Lasers, Wednesday, 10:30-12:30page 143

SW3G, Micro-and Photonic Crystal Lasers, Wednesday, 16:30-18:30page 163

STh1G, Semiconductor Lasers for Communication, Thursday, 08:00-10:00page 175

STh3G, Quantum Cascade Lasers I, Thursday, 14:00-15:45page 195

- STh4G, Quantum Cascade Lasers II**, Thursday, 16:30-18:30page 207
SF1G, Vertical Cavity Lasers, Friday, 08:00-10:00 . .page 219
SF2G, Laser Dynamics, Friday, 10:30-12:30page 231

Tutorial

- SW1G.4, Dealing with Loss in Plasmonics and Metamaterials**, Jacob Khurgin, *Johns Hopkins Univ., USA*, Wednesday, 11:30-12:30page 147

Invited

- SW1G.1, Electrically Driven Exciton-Polariton Lasers**, Christian Schneider, *Wuerzburg University - Technische Physik, Germany*, Wednesday, 10:30-11:00page 143
SW3G.1, Asymmetric Heterogeneously Integrated InP Microdisk Lasers on Si for Optical Interconnect and Optical Logic, Geert Morthier, *Ghent Univ., Ghent Univ., Belgium*, Wednesday, 16:30-17:00page 163
STh1G.7, Quantum Teleportation using Entangled LEDs, Richard Stevenson, *Toshiba Research Europe Limited, UK*, Thursday, 09:30-10:00page 179
SF1G.3, Recent Progress in Near-Infrared Vertical External Cavity Surface Emitting Laser (VECSEL) Grown by Metal Organic Vapour Phase Epitaxy (MOVPE), Wolfgang Stolz, *Philipps Universitat Marburg, Germany*, Friday, 08:30-09:00page 219

Short Courses

- SC221: Nano Photonics: Physics and Techniques**, Axel Scherer, *Caltech, USA*, Sunday, 08:30-12:30page 19
SC301: Quantum Cascade Lasers: Science, Technology, Applications and Markets, Federico Capasso, *Harvard Univ., USA*, Monday, 12:30-16:30page 22
SC318: Coherent and Incoherent Laser Beam Combining: Theory and Methods, James Leger, *Univ. of Minnesota, USA*, Sunday, 13:30-17:30page 19
SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26
SC403: NanoCavity Quantum Electrodynamics and Applications, Jelena Vuckovic, *Stanford Univ., USA*, Sunday, 14:00-17:00page 21

S&I 4: Nonlinear Optical Technologies

Technical Sessions

- SM1I, Parametric Sources**, Monday, 08:00-10:00. . . .page 52
SM2I, Mode-locked OPOs, Monday, 10:30-12:30 . . .page 64
SM3I, Few-Cycle-Pulse Nonlinear Optical Technologies, Monday, 13:30-15:30page 76
SM4I, Advanced QPM Devices, Monday, 16:00-18:00page 88
STu1I, Nonlinear Optical Materials, Tuesday, 11:00-13:00page 100
STu2I, All Optical and Quantum Signal Processing, Tuesday, 14:00-16:00page 112
STu3I, Novel Applications of Nonlinear Optics, Tuesday, 16:30-18:30page 124
SW1I, Solitons and Nonlinear Propagation, Wednesday, 10:30-12:30page 144

- SW3I, Novel Materials for Integrated Nonlinear Optics**, Wednesday, 16:30-18:30page 164
STh1I, Nonlinear Optics in Waveguides and Nanophotonics Devices, Thursday, 08:00-10:00. . . .page 176

Tutorial

- SW11.1, Supercontinuum and Solitons, What's Up?**, Goëry Genty, *Tampere Univ. of Technology, Finland*, Wednesday, 10:30-11:30page 144

Invited

- SM2I.3, Asynchronous Mid-Infrared Optical Parametric Oscillator Frequency Combs and Applications in Spectroscopy**, Derryck Reid, *Heriot-Watt Univ., UK*, Monday, 11:00-11:30page 64
SM3I.1, Sources and Diagnostics for Attosecond Science, Cord Arnold, *Lund Univ., Sweden*, Monday, 13:30-14:00page 76
STu11.3, Room-temperature Bonding and its Applications to Solid-state Lasers and Wavelength-conversion Devices, Ichiro Shoji, *Chuo Univ., Japan*, Tuesday, 11:30-12:00page 104
STu2I.1, New Applications and Devices for Quantum Frequency Conversion, Kartik Srinivasan, *NIST, USA*, Tuesday, 14:00-14:30page 112

Short Courses

- SC149: Foundations of Nonlinear Optics**, Robert Fisher, *R. A. Fisher Associates, USA*, Sunday, 08:30-12:30 . . .page 19
SC221: Nano Photonics: Physics and Techniques, Axel Scherer, *Caltech, USA*, Sunday, 08:30-12:30page 19
SC302: MetaMaterials, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 08:30-11:00page 18
SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26
SC378: Introduction to Ultrafast Optics, Rick Trebino, *George Institute of Technology, USA*, Sunday, 13:30-17:30page 20
SC379: Silicon Photonic Devices and Applicatio, Michal Lipson, *Cornell Univ., USA*, Tuesday, 09:00-12:00page 24
SC396: Frontiers of Guided Wave Nonlinear Optic, Ben Eggleton, *Univ. of Sydney, Australia*, Sunday, 13:30-17:30page 20

S&I 5: Terahertz Technologies and Applications

Technical Sessions

- STu1F, Manipulation & Detection of THz Radiation**, Tuesday, 11:00-13:00page 99
STu2F, THz Metamaterials and Plasmonics, Tuesday, 14:00-16:00page 111
SW1F, Nonlinear THz Science and Technology, Wednesday, 10:30-12:30page 143
SW3F, THz Spectroscopy & Sensing I, Wednesday, 16:30-18:30page 163
STh1F, THz Quantum Cascade Lasers, Thursday, 08:00-10:00page 175
STh3F, THz Waveguides and Optics, Thursday, 14:00-16:00page 195

STh4F, THz Imaging , Thursday, 16:30-18:30	page 207
SF1F, THz Spectroscopy & Sensing II , Friday, 08:00-10:00	page 219
SF2F, Advanced THz Emission Mechanisms , Friday, 10:30-12:30	page 231

Tutorial

SW3F.1, Intense Terahertz Pulses: Probing and Controlling Fundamental Motions of Electrons, Spins and Ions , Tobias Kampfrath, <i>Fritz Haber Institute/MPG, Germany</i> , Wednesday, 16:30-17:30	page 163
--	----------

Invited

STu1F.3, Silicon-based Sources and Detectors for Terahertz Applications , Ullrich Pfeiffer, <i>Bergische Universität Wuppertal, Germany</i> , Tuesday, 11:30-12:00	page 103
SW1F.1, Colliding Quasiparticles with Intense Terahertz Fields , Mark Sherwin, <i>Univ. of California Santa Barbara, USA</i> , Wednesday, 10:30-11:00	page 143
STh1F.4, The Development and Applications of Terahertz Quantum Cascade Lasers , Edmund Linfield, <i>Univ. of Leeds, UK</i> , Thursday, 08:45-09:15	page 179
STh4F.1, Sparse Imaging with Metamaterials at Terahertz Frequencies , Willie Padilla, <i>Boston College, USA</i> , Thursday, 16:30-17:00	page 207

Short Courses

SC149: Foundations of Nonlinear Optics , Robert Fisher, <i>R. A. Fisher Associates, USA</i> , Sunday, 08:30-12:30 . . .	page 19
SC301: Quantum Cascade Lasers: Science, Technology, Applications and Markets , Federico Capasso, <i>Harvard Univ., USA</i> , Monday, 12:30-16:30	page 22
SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications , Marcos Dantus, <i>Michigan State Univ., USA</i> , Tuesday, 13:00-16:00	page 26
SC378: Introduction to Ultrafast Optics , Rick Trebino, <i>George Institute of Technology, USA</i> , Sunday, 13:30-17:30	page 20

S&I 6: Optical Materials, Fabrication & Characterization

Technical Sessions

SM1H, Advanced Fabrication Techniques , Monday, 08:00-10:00	page 51
SM2H, Novel Approaches for Detection, Sensing and Characterization , Monday, 10:30-12:30	page 63
SM3H, 2D and Other Novel Materials , Monday, 13:30-15:30	page 75
SM4H, Light Emitting Materials and Devices , Monday, 16:00-18:00	page 87
STu1H, Plasmonic Devices , Tuesday, 11:00-13:00 . . .	page 99
STu2H, Controlling Light in Resonators and Photonic Crystals , Tuesday, 14:00-16:00	page 74
STu3H, Quantum & Nonlinear Materials & Devices , Tuesday, 16:30-18:30	page 123

Tutorial

SM4H.1, Light Emission from Silicon Photonic Crystals , Thomas Krauss, <i>Univ. of York, UK</i> , Monday, 16:00-17:00	page 87
--	---------

Invited

SM2H.3, Nano-focused Ultrafast Spectroscopy and Imaging Reaching the Single Quantum Level , Markus Raschke, <i>Univ. of Colorado at Boulder, USA</i> , Monday, 11:00-11:30	page 63
STu1H.3, Semiconductor Plasmonic Devices for Interconnects , Meir Orenstein, <i>Technion Israel Institute of Technology, Israel</i> , Tuesday, 11:30-12:00	page 103
STu3H.5, Si-based Microcavity Devices with Ge Quantum Dots , Jinsong Xia, <i>Huazhong Univ. of Science and Technology, China</i> , Tuesday, 17:30-18:00	page 127

Short Courses

SC221: Nano Photonics: Physics and Techniques , Axel Scherer, <i>Caltech, USA</i> , Sunday, 08:30-12:30	page 19
SC302: MetaMaterials , Vladimir M. Shalaev, <i>Purdue Univ., USA</i> , Sunday, 08:30-11:00	page 18
SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications , Marcos Dantus, <i>Michigan State Univ., USA</i> , Tuesday, 13:00-16:00	page 26
SC376: Plasmonics , Mark Brongersma, <i>Stanford Univ., USA</i> , Sunday, 13:00-16:00	page 22
SC396: Frontiers of Guided Wave Nonlinear Optic , Ben Eggleton, <i>Univ. of Sydney, Australia</i> , Sunday, 13:30-17:30	page 20

S&I 7: Micro- and Nano-Photonic Devices

Technical Sessions

SM1M, Frequency Combs and Novel Light Sources , Monday, 08:00-10:00	page 53
SM2M, Novel Platforms for Silicon Photonics , Monday, 10:30-12:30	page 65
SM3M, Nanophotonic Structures for Quantum Optics , Monday, 13:30-15:30	page 77
SM4M, Photonic Crystals , Monday, 16:00-18:00 . . .	page 89
STu1M, Applied Plasmonics , Tuesday, 11:00-13:00	page 101
STu2M, Novel Concepts in Nanophotonics , Tuesday, 14:00-16:00	page 113
STu3M, Microresonators , Tuesday, 16:30-18:30 . . .	page 125
SW1M, Micro and Nanophotonic Devices , Wednesday, 10:30-12:30	page 145
SW3M, Nonlinear Nanophotonics , Wednesday, 16:30-18:30	page 165
STh1M, Modulators using Novel Materials , Thursday, 08:00-10:00	page 177
STh3M, Silicon Photonics , Thursday, 14:00-15:45	page 177
STh4I, Novel Photodetectors , Thursday, 16:30-18:30	page 208
STh4M, Silicon Modulstors , Thursday, 16:30-18:30	page 209
SF1M, Optomechanics I , Friday, 08:00-10:00	page 221
SF1O, Integrated Polarization Management , Friday, 08:00-10:00	page 221
SF2M, Optomechanics II , Friday, 10:30-12:30	page 233
SF2O, Spectral and Spatial Filters , Friday, 10:30-12:30	page 233

Tutorial

SM2M.1, Organic Electro-optic Materials and Devices: Molecular Engineering Driving Device Performance and Technology Innovation, Robert Norwood, *Univ. of Arizona, USA*, Monday, 10:30-11:30page 65

Invited

SM1M.1, Ga(In)N Nanowire Light Emitting Diodes and Single Photon Sources, Pallab Bhattacharya, *Univ. of Michigan, USA*, Monday, 08:00-08:30page 53

SM3M.1, Nonlinear Optics and Quantum Networks Based on Single Atoms Coupled to a Photonic Crystal Cavity, Mikhail Lukin, *Harvard Univ., USA*, Monday, 13:30-14:00page 77

SM3M.4, Cavity Quantum Electrodynamics in Quantum Dot-Photonic Crystal Nanocavity Coupled System with Large g/κ , Satoshi Iwamoto, *Univ. of Tokyo, Japan*, Monday, 14:30-15:00page 81

SM4M.3, High-Q Optical Nanocavities in Bulk Single-crystal Diamond, Michael Burek, *Harvard Univ., USA*, Monday, 16:30-17:00page 89

STu2M.1, Photonic Topological Insulators, Mordechai Segev, *Technion Israel Institute of Technology, Israel*, Tuesday, 14:00-14:30page 113

STu2M.3, Observation of an Effective Magnetic Field for Light, Michal Lipson, *Cornell Univ., Cornell Univ., USA*, Tuesday, 14:45-15:15page 117

SW1M.1, Nano-Optical Scan Probes: Opening Doors to Previously-Inaccessible Parameter Spaces, James Schuck, *Lawrence Berkeley National Lab, USA*, Wednesday, 10:30-11:00page 145

Short Courses

SC221: Nano Photonics: Physics and Techniques, Axel Scherer, *Caltech, USA*, Sunday, 08:30-12:30page 19

SC302: MetaMaterials, Vladimir M. Shalaev, *Purdue Univ., USA*, Sunday, 08:30-11:00page 18

SC318: Coherent and Incoherent Laser Beam Combining: Theory and Methods, James Leger, *Univ. of Minnesota, USA*, Sunday, 13:30-17:30page 19

SC339: Optical Atomic Clocks: New Science and Technology, Scott Diddams, Chris Oats, *NIST, USA*, Sunday, 08:30-11:30page 18

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

SC376: Plasmonics, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22

SC379: Silicon Photonic Devices and Applications, Michal Lipson, *Cornell Univ., USA*, Tuesday, 09:00-12:00page 24

SC396: Frontiers of Guided Wave Nonlinear Optic, Ben Eggleton, *Univ. of Sydney, Australia*, Sunday, 13:30-17:30page 20

SC403: NanoCavity Quantum Electrodynamics and Applications, Jelena Vuckovic, *Stanford Univ., USA*, Sunday, 14:00-17:00page 21

SC410: Finite Element Modeling Methods for Photonics and Optics, Arti Agrawal, *City Univ., UK*, Tuesday, 09:00-12:00page 24

S&I 8: Ultrafast Optics, Optoelectronics & Applications

Technical Sessions

STu1E, Applications of fs Lasers, Tuesday, 11:00-13:00page 99

STu2E, fs - Oscillators, Tuesday, 14:00-16:00page 111

STu3E, Pulse Characterization and Ultrafast Imaging, Tuesday, 16:30-18:30page 123

SW1E, Pulse Compression, Wednesday, 10:30-12:30page 143

SW3E, Coherent Combining and fs Fiber Lasers, Wednesday, 16:30-18:30page 163

STh1E, Filamentation, Thursday, 08:00-10:00page 175

STh3E, High Harmonics and Field Synthesis, Thursday, 14:00-16:00page 195

STh4E, OPO, OPA and Regenerative Amplifiers, Thursday, 16:30-18:30page 207

SF1E, FROG and Pulse Characterization, Friday, 08:00-10:00page 219

SF2E, Frequency Combs and CEP, Friday, 10:30-12:30page 231

Tutorial

STu1E.1, Femtosecond laser processing of materials, Eric Mazur, *Harvard Univ., USA*, Tuesday, 11:00-12:00page 99

Invited

SW1E.3, Self-Compression to Sub-Cycle Regime in Kagome Hollow-Core Photonic Crystal Fiber, Frédéric G r me, *Xlim Research Institute, France*, Wednesday, 11:00-11:30page 147

SW3E.3, Performance Scaling of Ultrafast Laser Systems by Coherent Addition of Femtosecond Pulses, Jens Limpert, *Friedrich-Schiller-Universit t Jena, Germany*, Wednesday, 17:00-17:30page 163

STh3E.1, Synthesizing Optical Fields of Arbitrary Shape, Andy Kung, *Academia Sinica, National Tsing Hua Univ., Taiwan*, Thursday, 14:00-14:30page 195

STh3E.6, Isolated Attosecond Continua in the Water Window via High Harmonic Generation using a Few-cycle Infrared Light Source, Nobuhisa Ishii, *Institute for Solid State Physics, Japan*, Thursday, 16:30-16:00page 203

SF1E.3, Spectro-Temporal Characterization of All Channels in a Sub-Optical-Cycle Parametric Waveform Synthesizer, Giulio Maria Rossi, *Center for Free-Electron Laser Science, DESY, Hamburg Center for Ultrafast Imaging, Germany*, Friday, 08:30-09:00page 219

Short Courses

SC149: Foundations of Nonlinear Optics, Robert Fisher, *R. A. Fisher Associates, USA*, Sunday, 08:30-12:30page 19

SC221: Nano Photonics: Physics and Techniques, Axel Scherer, *Caltech, USA*, Sunday, 08:30-12:30page 19

SC339: Optical Atomic Clocks: New Science and Technology, Scott Diddams, Chris Oats, *NIST, USA*, Sunday, 08:30-11:30page 18

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

- SC376: Plasmonics**, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22
- SC378: Introduction to Ultrafast Optics**, Rick Trebino, *George Institute of Technology, USA*, Sunday, 13:30-17:30page 20
- SC379: Silicon Photonic Devices and Applications**, Michal Lipson, *Cornell Univ., USA*, Tuesday, 09:00-12:00page 24
- SC396: Frontiers of Guided Wave Nonlinear Optics**, Ben Eggleton, *Univ. of Sydney, Australia*, Sunday, 13:30-17:30page 20

S&I 9: Components, Integration, Interconnects and Signal Processing

Technical Sessions

- SM1G, Optical Signal Processing**, Monday, 08:00-10:00page 51
- SM2G, Silicon Photonic Modulators**, Monday, 10:30-12:30page 63
- SM3G, Micro-Resonators**, Monday, 13:30-15:30page 75
- SM4G, Integrated Photonic Devices and Circuits**, Monday, 16:00-18:00page 87
- STu1G, Integrated Components for Optical Communications**, Tuesday, 11:00-13:00page 99
- STu2G, RF Photonics**, Tuesday, 14:00-16:00page 111
- STu3G, Photodetectors**, Tuesday, 16:30-18:30page 123

Tutorial

- STu3G.5, Single Photon Imagers**, Edoardo Charbon, *Technische Universiteit Delft, Netherlands*, Tuesday, 17:30-18:30page 127

Invited

- SM2G.6, 16QAM Silicon-Organic Hybrid (SOH) Modulator Operating with 0.6 Vpp and 19 fJ/bit at 112 Gbit/s**, Matthias Lauermann, *Karlsruhe Institute of Technology, Germany*, Monday, 11:45-12:15page 67
- SM3G.1, Breaking the Conventional Limitations of Microrings**, Joyce Poon, *Univ. of Toronto, Canada*, Monday, 13:30-14:00page 75
- STu1G.3, InP-Based 100 Gb/s Coherent Receiver Technologies**, Hideki Yagi, *Sumitomo Electric Industries Ltd, Japan*, Tuesday, 11:30-12:00page 103

Short Courses

- SC318: Coherent and Incoherent Laser Beam Combining: Theory and Methods**, James Leger, *Univ. of Minnesota, USA*, Sunday, 13:30-17:30page 19
- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26
- SC376: Plasmonics**, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22
- SC396: Frontiers of Guided Wave Nonlinear Optics**, Ben Eggleton, *Univ. of Sydney, Australia*, Sunday, 13:30-17:30page 20
- SC410: Finite Element Modeling Methods for Photonics and Optics**, Arti Agrawal, *City Univ., UK*, Tuesday, 09:00-12:00page 24

S&I 10: Biophotonics and Optofluidics

Technical Sessions

- SM3P, Bioimaging I**, Monday, 13:30-15:30page 77
- SM4P, Bioimaging II: Thermal, Spectral and Nanoparticles**, Monday, 16:00-18:00page 89
- STh1H, Advanced Imaging Technologies**, Thursday, 08:00-10:00page 175
- STh3H, Sensing with Optofluidics**, Thursday, 14:00-16:00page 195
- STh4H, Plasmonics, Raman and Resonance Sensing**, Thursday, 16:30-18:30page 207
- SF1H, Optical Manipulation for Biomedical Application**, Friday, 08:00-10:00page 219

Tutorial

- STh3H.1, Optofluidics for Mobile Health, Bioenergy, and Nanoparticle Analysis**, David Erickson, *Cornell Univ., USA*, Thursday, 14:00-15:00page 195

Invited

- SM3P.5, Fluorescence Lifetime Imaging for Biomedicine**, Paul French, *Imperial College London, UK*, Monday, 14:30-15:00page 81
- STh1H.6, Computational Imaging and Sensing for Biophotonics Applications**, Aydogan Ozcan, *Univ. of California Los Angeles, USA*, Thursday, 09:15-09:45page 179
- SF1H.5, Shaping the Future of Biophotonics: Imaging and Manipulation**, Kishan Dholakia, *Univ. of St Andrews, UK*, Friday, 09:00-09:30page 223

Short Courses

- SC221: Nano Photonics: Physics and Techniques**, Axel Scherer, *Caltech, USA*, Sunday, 8:30-12:30page 19
- SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications**, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

S&I 11: Fibers, Propagation and Nonlinear Effects, Lasers, Devices and Materials

Technical Sessions

- SM1N, SDM and Bandgap Fibers**, Monday, 08:00-10:00page 53
- SM1O, Pulse Generation and Amplification**, Monday, 08:00-10:00page 53
- SM2N, Modes in Fibers**, Monday, 10:30-12:30page 65
- SM3N, Gas-Filled Hollow Fibers**, Monday, 13:30-15:30page 77
- SM4N, Nonlinear Optical Effects in Fibers**, Monday, 16:00-18:00page 89
- STu1L, Mid-infrared Fiber Lasers**, Tuesday, 11:00-13:00page 100
- STu1N, Mode-locked Fiber Lasers**, Tuesday, 11:00-13:00page 101
- STu2N, High Power Pulsed Fiber Lasers**, Tuesday, 14:00-16:00page 113
- STu3N, Fiber Measurement and Devices**, Tuesday, 16:30-18:30page 125

- SW1N, Novel Fiber Laser Designs**, Wednesday,
10:30-12:30page 145
- SW3N, High Power Laser**, Wednesday,
16:30-18:30page 165
- STh3N, Supercontinuum Generation**, Thursday,
14:00-16:00page 197
- STh4N, Coherent Combination and Amplification**,
Thursday, 16:30-18:30page 209
- SF1N, Next Generation Fiber Designs**, Friday,
08:00-10:00page 221
- SF2N, High Energy fs Fiber Laser & Applications**,
Friday, 10:30-12:15page 233

Tutorial

- SM1N.1, Emerging Fiber Technology for Space Division
Multiplexed Optical Communications**, David Richardson,
Univ. of Southampton, UK, Monday, 08:00-09:00page 53

Invited

- SM2N.3, The Photonic Lantern**, Timothy Birks, *Univ.
of Bath, UK*, Monday, 11:00-11:30page 65
- SM3N.1, Tunable Sources from the Visible to
Vacuum-UV Based on Gas-Filled Hollow-Core Photonic
Crystal Fibers**, John Travers, *Max Planck Institute,
Germany*, Monday, 13:30-14:00page 77
- STu1L.1, Robust Multimaterial Tellurium-based
Chalcogenide Glass Infrared Fibers**, Guangming Tao,
Univ. of Central Florida, USA, Tuesday,
11:00-11:30page 101
- STu3N.1, Broadband and Ultrahigh Resolution Optical
Spectroscopy using a Tapered Fiber**, Noel Wan, *MIT;
Columbia Univ., USA*, Tuesday, 16:30-17:00page 125
- SW1N.1, Ultra-long Fibre-based Random Lasers**, Sergei
Turitsyn, *Aston Univ., Novosibirsk State Univ., UK*,
Wednesday, 10:30-11:00page 145
- STh4N.1, Phase-locked Multicore Fiber Lasers**, Akira
Shirakawa, *Univ. of Electro-Communications, Japan*,
Thursday, 16:30-17:00page 209
- SF1N.1, First Demonstration of Single Trench Fiber for
Delocalization of Higher Order Modes**, Deepak Jain,
Univ. of Southampton, UK, Friday, 08:00-08:30page 221
- SF2N.1, Fiber Lasers for Accelerators and Accelerator
Driven Light Sources**, Ingmar Hartl, *DESY, Germany*,
Friday, 10:30-11:00page 233

Short Courses

- SC270: High Power Fiber Lasers and Amplifiers**, W.
Andrew Clarkson, *Optoelectronics Res. Ctr., Univ. of
Southampton, UK*, Monday, 12:30-16:30page 21
- SC318: Coherent and Incoherent Laser Beam Combining:
Theory and Methods**, James Leger, *Univ. of Minnesota,
USA*, Sunday, 13:30-17:30page 19
- SC352: Introduction to Ultrafast Pulse Shaping—
Principles and Applications**, Marcos Dantus, *Michigan
State Univ., USA*, Tuesday, 13:00-16:00page 26
- SC396: Frontiers of Guided Wave Nonlinear Optic**,
Ben Eggleton, *Univ. of Sydney, Australia*, Sunday,
13:30-17:30page 20
- SC410: Finite Element Modeling Methods for Photonics
and Optics**, Arti Agrawal, *City Univ., UK*, Tuesday,
9:00-12:00page 24

S&I 12: Lightwave Communications and Optical Networks

Technical Sessions

- SM2F, Advanced Solid State Laser Architectures**,
Monday, 10:30-12:30page 63
- SM3J, Spatial Multiplexing**, Monday,
13:30-15:30page 76
- SM4J, Free Space Laser Communications**, Monday,
16:00-18:00page 88
- STu1J, Short Reach Communications**, Tuesday,
11:00-13:00page 100
- STu2J, Phase Sensitive Amplification and Optical
Regeneration**, Tuesday, 14:00-16:00page 112
- STu3J, DSP and Coding**, Tuesday, 16:30-18:30page 124
- SW1J, Bandwidth Efficient Signaling**, Wednesday,
10:30-12:30page 144
- SW3J, Subsystems for Optical Communications**,
Wednesday, 16:30-18:30page 164

Tutorial

- STu2J.4, Phase-sensitive Amplification in Communications
and Signal Processing**, Zhi Tong, *Univ. of California San
Diego, Infinera Corp, USA*, Tuesday, 15:00-16:00page 116

Invited

- SM3J.7, Novel Fibers and Devices for Space-Division
Multiplexed Transmission**, Guifang Li, *Univ. of Central
Florida, Tianjin Univ., USA*, Monday, 15:00-15:30page 84
- SM4J.1, Overview and On-orbit Performance of the
Lunar Laser Communication Demonstration Uplink**,
Mark Stevens, *MIT Lincoln Lab, USA*, Monday,
16:00-16:30page 88
- STu2J.1, Signal Regeneration Techniques for Advanced
Modulation Formats**, Francesca Parmigiani, *Univ. of
Southampton, UK*, Tuesday, 14:00-14:30page 112

Short Courses

- SC352: Introduction to Ultrafast Pulse Shaping—
Principles and Applications**, Marcos Dantus, *Michigan
State Univ., USA*, Tuesday, 13:00-16:00page 26
- SC396: Frontiers of Guided Wave Nonlinear Optic**,
Ben Eggleton, *Univ. of Sydney, Australia*, Sunday,
13:30-17:30page 20

S&I 13: Active Optical Sensing

Technical Sessions

- SM1E, Atmospheric Sensing**, Monday,
08:00-10:00page 51
- SM2E, Spectroscopic Chemical Detection**, Monday,
10:30-12:30page 63
- SM3E, Nano-, Micro-, and Waveguide-sensing**,
Monday, 13:30-15:15page 75
- SM4E, Remote and Stand-off Optical Detection**,
Monday, 16:00-18:00page 87
- SF2I, Combustion and Plasma Diagnostics**, Friday,
10:30-12:30page 232

Tutorial

SM1E.1, Recent developments in measurements of atmospheric trace gases, Steven Wofsy, *Harvard Univ., USA*, Monday, 08:00-09:00page 51

Invited

SM2E.1, Solvent-driven Ionic Processes In Water: Surface Adsorption and Cation-Cation Pairing, Studied by X-ray Absorption and UV-SHG Spectroscopy, Richard James Saykally, *Univ. of California Berkeley, USA*, Monday, 10:30-11:00page 63

SF2I.5, Instantaneous Volumetric Combustion Diagnostics, Lin Ma, *Virginia Tech, USA*, Friday, 11:30-12:00page 236

Short Courses

SC301: Quantum Cascade Lasers: Science, Technology, Applications and Markets, Federico Capasso, *Harvard Univ., USA*, Monday, 12:30-16:30page 22

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

S&I 14: Optical Metrology

Technical Sessions

SW1O, Laser Frequency Combs, Wednesday, 10:30-12:30page 145

SW3O, Optical Clocks & Dissemination, Wednesday, 16:30-18:30page 165

STh1N, Comb Spectroscopy, Thursday, 08:00-10:00page 177

STh3O, Timing and Imaging, Thursday, 14:00-16:00page 197

STh4O, Gravity and Distance Measurements, Thursday, 16:30-18:30page 209

SF1I, Microresonator Combs, Friday, 08:00-10:00page 220

Tutorial

STh4O.4, Precision Measurement at the Quantum Limit in Gravitational Wave Detectors, Nergis Mavalvala, *MIT, USA*, Thursday, 17:30-18:30page 213

Invited

SW3O.1, Optical Atomic Clocks for a Future New Definition of the Second, Fritz Riehle, *Physikalisch Technische Bundesanstalt, Germany*, Wednesday, 16:30-17:00page 165

STh4O.1, High Sensitivity Gravity Measurement with Cold Atom Interferometry, Zhongkun Hu, *Huazhong Univ of Science and Technology, China*, Thursday, 16:30-17:00page 209

Short Courses

SC339: Optical Atomic Clocks: New Science and Technology, Scott Diddams, Chris Oats, *NIST, USA*, Sunday, 08:30-11:30page 18

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

SC378: Introduction to Ultrafast Optics, Rick Trebino, *George Institute of Technology, USA*, Sunday, 13:30-17:30page 20

S&I 15: LEDs, Photovoltaics and Energy-Efficient ('Green') Photonics

Technical Sessions

SM1J, UV and Visible LEDs, Monday, 08:00-10:00page 52

SM2J, Nanostructured LEDs and Photovoltaics, Monday, 10:30-12:30page 64

STh3I, Photovoltaics Sciences, Thursday, 14:00-16:00page 196

Tutorial

STh3I.1, Flexible, Microscale Inorganic LEDs and Solar Cells, John Rogers, *Univ of Illinois at Urbana-Champaign, USA*, Thursday, 14:00-15:00page 196

Invited

SM1J.5, Auger Recombination in Light-Emitting Materials, Emmanouil Kiopakakis, *Univ. of Michigan; Univ. of California, USA*, Monday, 09:00-09:30page 56

SM2J.5, Nanowire-based LEDs and Photovoltaics, Lars Samuelson, *Lund Univ.; Sol Voltaics AB, Sweden*, Monday, 11:30-12:00page 68

Short Courses

SC352: Introduction to Ultrafast Pulse Shaping—Principles and Applications, Marcos Dantus, *Michigan State Univ., USA*, Tuesday, 13:00-16:00page 26

SC376: Plasmonics, Mark Brongersma, *Stanford Univ., USA*, Sunday, 13:00-16:00page 22

Symposium on Advanced Ultrashort Pulse Laser Technologies in Biophotonics and Nanobiophotonics

ATH3P, Symposium on Advanced Ultrashort Pulse Laser Technologies in Biophotonics and Nanobiophotonics I, Thursday, 14:00-16:00page 197

ATH4P, Symposium on Advanced Ultrashort Pulse Laser Technologies in Biophotonics and Nanobiophotonics II, Thursday, 16:30-18:30page 209

Invited

ATH3P.1, Advances in Short-Pulse Fiber Lasers for Nonlinear Microscopy, Frank Wise, *Cornell Univ., USA*, Thursday, 14:00-14:30page 197

ATH4P.1, Plasmonic Nanobubble Theranostics: Detection and Destruction of Drug-Resistant Tumors in a Single Rapid Procedure, Dmitri Lapotko, *Rice Univ., USA*, Thursday, 16:30-17:00page 209

ATH4P.4, Progress in Laser-Driven Ion Acceleration Towards Applications in Radiotherapy, Paul McKenna, *Univ. of Strathclyde, UK*, Thursday, 17:30-18:00page 213

Symposium on Advances in Molecular Imaging

AM1P, Symposium on Advances in Molecular Imaging I, Monday, 08:00-10:00page 53

AM2P, Symposium on Advances in Molecular Imaging II, Monday, 10:30-12:30page 65

Invited

AM1P.1, Clinical Translation and Discovery with Near-infrared Fluorescence Lymphatic Imaging, John Rasmussen, *Univ. of Texas Health Science Center, USA*, Monday, 08:00-08:30page 53

AM1P.2, Clinical translation of near-infrared image-guided surgery: Where do we stand?, Sylvain Gioux, *BIDMC / Harvard Medical School, USA*, Monday, 08:30-09:00page 53

AM1P.3, In Vivo Molecular Imaging using Cerenkov Luminescence, Simon Cherry, *Univ. of California Davis, USA*, Monday, 09:00-09:30page 57

AM1P.4, 3D Optoacoustic Tomography: From Molecular Targets in Mouse Models to Functional Imaging of Breast Cancer, Alexander Oraevsky, *TomoWave Laboratories, Inc, USA*, Monday, 09:30-10:00page 61

AM2P.1, NIR Fluorescent Contrast Agents for Detection of Inflammation of Lungs in vivo, Jeff Thompson, *Harvard Univ., USA*, Monday, 10:30-11:00page 65

AM2P.2, Emerging Trends with Molecularly Targeted Optobeacons for Photoacoustic Tomographic Imaging, Dipanjan Pan, *Univ of Illinois at Urbana-Champaign, USA*, Monday, 11:00-11:30page 65

AM2P.5, Molecular Imaging for Early Cancer Diagnosis, Surgery and Therapy, Quyen Nguyen, *UC San Diego Health System, USA*, Monday, 12:00-12:30page 73

Symposium on Advances in Neurophotonics

AF1B, Symposium on Advances in Neurophotonics I, Friday, 08:00-10:00page 218

AF2B, Symposium on Advances in Neurophotonics II, Friday, 10:30-12:30page 230

Invited

AF1B.1, Optogenetic Approaches for Deciphering the Neural Circuits of the Cortex, Solange Brown, *Johns Hopkins Univ., USA*, Friday, 08:00-08:30page 218

AF1B.2, Non-invasive 3D Optical Imaging of Tissue Microstructure and Microcirculations in Vivo, Ruikang Wang, *Univ. of Washington, USA*, Friday, 08:30-09:00page 218

AF1B.5, Visible Brain-wide Networks at Single-neuron Resolution with Micro-Optical Sectioning Tomography, Qingming Luo, *Wuhan National Laboratory for Optoelectronics-Huazhong Univ. of Science and Tech, Huazhong Univ. of Science and Tech, China*, Friday, 09:30-10:00page 226

AF2B.1, Serial Optical Coherence Scanner for Brain Imaging and Mapping, Taner Akkin, *Univ. of Minnesota, USA*, Friday, 10:30-11:00page 230

AF2B.2, Optical Coherence Imaging of Hemodynamics, Metabolism, and Cell Viability during Brain Injury, Vivek Srinivasan, *Univ. of California Davis, USA*, Friday, 11:00-11:30page 230

AF2B.3, High-Resolution Optical Microscopy Imaging of Cortical Oxygen Delivery and Consumption, Sava Sakadzic, *Harvard Medical School, Massachusetts General Hospital, USA*, Friday, 11:30-12:00page 234

AF2B.4, Optical Sensing and Control in Live Animals for Early Detection of Diseases, Daniel Cote, *Universite Laval, CRIUSMQ, Canada*, Friday, 12:00-12:30page 234

Symposium on Enabling Photonics Technologies for Miniaturization

AM3L, Symposium on Enabling Photonics Technologies for Miniaturization I, Monday, 13:30-15:30page 76

AM4L, Symposium on Enabling Photonics Technologies for Miniaturization II, Monday, 16:00-18:00page 88

Invited

AM3L.1, Mapping (slow) Light at the Nanoscale - Don't Forget the Magnetic Field, L (Kobus) Kuipers, *FOM Institute AMOLF, , Monday, 13:30-14:00page 76*

AM3L.2, Management of the photon orbital angular momentum at small scale, Etienne Brasselet, *Univ. of Bordeaux, CNRS, France*, Monday, 14:00-14:30page 76

AM3L.3, Recent advances in ultrafast laser nanostructuring: S-waveplate and eternal data storage, Peter Kazansky, *Univ. of Southampton, UK*, Monday, 14:30-15:00page 80

AM3L.4, Light-guided Nano-Torches in Mesoscopy, Jesper Gluckstad, *Danmarks Tekniske Universitet, Denmark*, Monday, 15:00-15:30page 84

AM4L.1, Fabrication of Subwavelength Optics using Glass Imprint Process, Junji Nishii, *Hokkaido Univ., Japan*, Monday, 16:00-16:30page 88

AM4L.2, Micro-Optics Tech Supply Chain as Key-enabler for Applied Research and Industrial Innovation, Hugo Thienpont, *Vrije Universiteit Brussel, Belgium*, Monday, 16:30-17:00page 88

AM4L.3, Optically Driven Microfluidic Devices Produced by Two-Photon Microfabrication, Shoji Maruo, *Yokohama National Univ., Japan*, Monday, 17:00-17:30page 92

AM4L.4, Microfabricated Optically-Pumped Magnetometers, Svenja Knappe, *National Inst of Standards & Tech, USA*, Monday, 17:30-18:00page 96

Symposium on High Performance Optics

JTh3J, Symposium on High Performance Optics I, Thursday, 14:00-16:00page 196

JTh4J, Symposium on High Performance Optics II, Thursday, 16:30-18:30page 208

Invited

JTh3J.1, Defect-driven laser-induced damage in optical coatings, Xinbin Cheng, *MOE Key Laboratory of Advanced Micro-Structured Materials, Tongji Univ., China*, Thursday, 14:00-14:30page 196

- JTh3J.5, Dispersive Mirrors for Short Pulse Lasers**, Vladimir Pervak, *Ludwig-Maximilians-Universität München, Ultrafast Innovations GmbH, Germany*, Thursday, 15:15-15:45page 200
- JTh4J.2, James Webb Space Telescope (JWST): Optical Performance of a Large Deployable Cryogenic Telescope**, Paul Lightsey, *Ball Aerospace & Technologies, USA*, Thursday, 16:45-17:15page 208
- JTh4J.3, Metrology and Coatings for the 40 kg LIGO Optics**, Rana Adhikari, *California Institute of Tech, USA*, Thursday, 17:15-17:45page 212
- JTh4J.5, State of the Art Optical Materials for Lithographic Systems for Semiconductor Manufacturing**, Ralf Takke, *Heraeus Quarzglas GmbH & Co. KG, Germany*, Thursday, 18:00-18:30page 212

Symposium on Large-Scale Silicon Photonic Integration

- SM3O, Symposium on Large-Scale Silicon Photonic Integration I**, Monday, 13:30-15:30page 77
- SM4O, Symposium on Large-Scale Silicon Photonic Integration II**, Monday, 16:00-18:00page 89

Invited

- SM3O.1, Ge-on-Si Integrated Photonics**, Jifeng Liu, *Dartmouth College, USA*, Monday, 13:30-14:00page 77
- SM3O.2, Heterogeneous Integration on Silicon**, Gregory Fish, *Aurion, Inc. USA*, Monday, 14:00-14:30page 77
- SM3O.3, Silicon-Organic Hybrid - a compact and energy efficient CMOS compatible active silicon photonic solution**, Juerg Leuthold, *ETH Zurich, Switzerland*, Monday, 14:30-15:00page 81
- SM3O.4, CMOS integrated Silicon Photonics – Does it Make Sense?**, Wilfried Haensch, *International Business Machines Corp, USA*, Monday, 15:00-15:15page 85
- SM4O.1, Silicon PICs for Telecomm**, Christopher Doerr, *Acacia Communications, Inc., USA*, Monday, 16:00-16:30page 89
- SM4O.2, Silicon Photonics Transmitters and Receivers for 4x25 Gb/s Interconnects**, Pegah Seddighian, *Mellanox, USA*, Monday, 16:30-17:00page 89
- SM4O.3, A WDM CMOS Photonic Platform for Chip-to-Chip Optical Interconnects**, Xuezhe Zheng, *Oracle Corporation, USA*, Monday, 17:00-17:30page 93
- SM4O.4, Very Large Scale Silicon Photonics Integration**, Michael Watts, *MIT, USA*, Monday, 17:30-18:00page 97

Symposium on Laser Processing for Consumer Electronics

- ATu2L, Symposium on Laser Processing for Consumer Electronics I**, Tuesday, 14:00-16:00page 112
- ATu3L, Symposium on Laser Processing for Consumer Electronics II**, Tuesday, 16:30-18:30page 124

Invited

- ATu2L.1, Ultrafast laser processing and metrology**, Keiji Nomaru, *DISCO Corporation, Japan*, Tuesday, 14:00-14:30page 112

- ATu2L.2, Opaque Film Metrology using PULSE Tech**, Manjusha Mehendale, *Rudolph Technologies, USA*, Tuesday, 14:30-15:00page 112
- ATu2L.3, Laser micronanostructuring for high-performance organic optoelectronic devices**, Hong-Bo Sun, *Jilin Univ., China*, Tuesday, 15:00-15:30page 116
- ATu2L.4, Laser Direct Ablation for Patterning Printed Wiring Boards Using Ultrafast Lasers and High Speed Beam Delivery Architectures**, Hisashi Matsumoto, *Electro Scientific Industries, Inc., USA*, Tuesday, 15:30-16:00page 120
- ATu3L.1, Laser Cutting of Flexible Glass**, Xinghua Li, *Corning Incorporated, USA*, Tuesday, 16:30-17:00page 124
- ATu3L.2, High Throughput Laser Processing with Ultra-Short Pulses by High Speed Line-Scanning in Synchronized Mode**, Beat Neuenschwander, *Bern Univ. of Applied Sciences, Switzerland*, Tuesday, 17:00-17:30page 124
- ATu3L.3, Laser Processes for Development of Advanced Lithium-Ion Batteries – Increased Capacity and Cycle Life-Time**, Wilhelm Pflöging, *Karlsruher Institut für Technologie, Karlsruhe Nano Micro Facility, Germany*, Tuesday, 17:30-18:00page 128

Symposium on Laser-Driven Sources of Particle and X-ray Beams

- JTh1L, Symposium on Laser-Driven Sources of Particle and X-Ray Beams I**, Thursday, 08:00-10:00page 176
- JTh3L, Symposium on Laser-Driven Sources of Particle and X-Ray Beams II**, Thursday, 14:00-16:00page 196
- JTh4L, Symposium on Laser-Driven Sources of Particle and X-Ray Beams III**, Thursday, 16:30-18:30page 208

Invited

- JTh1L.1, Laser Plasma Acceleration using the PW-class BELLA Laser**, Wim Leemans, *Lawrence Berkeley National Laboratory, UC, USA*, Thursday, 08:00-08:30page 176
- JTh1L.5, Current Status and Future Prospects of Laser-driven Ion Sources**, Marco Borghesi, *The Queen's Univ. of Belfast, Institute of Physics of the ASCR, UK*, Thursday, 09:15-09:45page 180
- JTh3L.1, X-ray Emission from Laser-Accelerated Electrons and its use as Diagnostic of Laser-Plasma Interaction**, Sebastien Corde, *Laboratoire d'optique appliquée, USA*, Thursday, 14:00-14:30page 196
- JTh3L.4, Producing Bright X-rays for Imaging Applications Using a Laser Wakefield Accelerator**, Stuart Mangles, *Imperial College London, UK*, Thursday, 15:00-15:30page 200
- JTh4L.1, Picosecond Thin-Disk Lasers**, Thomas Metzger, *TRUMPF Scientific Lasers GmbH + Co. KG, Germany*, Thursday, 16:30-17:00page 208
- JTh4L.4, Status of High-Energy OPCPA at LLE and Future Prospects**, Jonathan Zuegel, *Univ. of Rochester, USA*, Thursday, 17:30-18:00page 212

Symposium on Microcavity Exciton-polaritons, Devices and Applications

STu2O, Symposium on Microcavity Exciton-Polaritons, Devices and Applications I, Tuesday, 14:00-16:00 . . .page 113

STu3O, Symposium on Microcavity Exciton-Polaritons, Devices and Applications II, Tuesday, 16:30-18:30page 125

Invited

STu2O.1, Persistent Current of a Microcavity Polariton Condensate in a Ring Geometry, David Snoke, *Univ. of Pittsburgh, USA*, Tuesday, 14:00-14:30page 113

STu2O.4, Single-mode Polariton Laser in a Designable Microcavity, Hui Deng, *Univ. of Michigan, USA*, Tuesday, 15:00-15:30page 117

STu3O.1, Polariton Lattices for Quantum Simulation, Alberto Amo, *CNRS, France*, Tuesday, 16:30-17:00page 125

STu3O.4, Spectroscopy of Strongly-Coupled Organic Semiconductor Microcavities, David Lidzey, *Univ. of Sheffield, UK*, Tuesday, 17:30-18:00page 129

Symposium on Novel Light Sources and Photonic Devices in Optical Imaging

ATu2P, Symposium on Novel Light Sources and Photonic Devices in Optical Imaging I, Tuesday, 14:00-16:00page 113

ATu3P, Symposium on Novel Light Sources and Photonic Devices in Optical Imaging II, Tuesday, 16:30-18:30page 125

Invited

ATu2P.1, Advancements in Nanophotonic-Based Optical Coherence Tomography, Nicholas Sherwood, *Tornado Spectral Systems, USA*, Tuesday, 14:00-14:30page 113

ATu2P.2, Next Generation Swept-sources for OCT and Other Applications, Brian Goldberg, *AXSUN Technologies Inc, USA*, Tuesday, 14:30-15:00page 113

ATu3P.1, Laser Sources for Deep Tissue Multiphoton Imaging, Chris Xu, *Cornell Univ., USA*, Tuesday, 16:30-17:00page 125

ATu3P.2, Multiphoton imaging and manipulation of biological systems, Jeffrey Squier, *Colorado School of Mines, USA*, Tuesday, 17:00-17:30page 125

Symposium on Optofluidic Microsystems

AF1L, Symposium on Optofluidic Microsystems I, Friday, 08:00-10:00.page 220

AF2L, Symposium on Optofluidic Microsystems II, Friday, 10:30-12:00.page 232

Invited

AF1L.1, Optofluidics 10 Years Later, Demetri Psaltis, *EPFL, Switzerland*, Friday, 2014, 08:00-08:30page 220

AF1L.2, Optofluidic Bio-Lasers: Bridging Photonics, NanoTech, and Biology, Xudong Fan, *Univ. of Michigan, USA*, Friday, 2014, 08:30-09:00page 220

AF2L.1, Optofluidic Manipulation and Sorting for Small Size Particle and Bio-molecule, Ai-Qun Liu, *Nanyang Technological Univ., Singapore*, Friday, 2014, 10:30-11:00page 232

AF2L.4, Optofluidic Integration: Past, Present, and Future, Holger Schmidt, *Univ. of California Santa Cruz, USA*, Friday, 2014, 11:30-12:00page 236

Symposium on Quantum Repeaters

FTu1A, Symposium on Quantum Repeaters I, Tuesday, 11:00-13:00page 98

FTu2A, Symposium on Quantum Repeaters II, Tuesday, 14:00-16:00page 110

Invited

FTu1A.1, Ultrafast Quantum Repeaters for Long Distance Quantum Communication, Liang-Xing Jiang, *School of Metallurgical Science and Engineering, Central South Univ., China*, Tuesday, 11:00-11:30page 98

FTu1A.4, Quantum Repeater Approach based on Diamond Spin Qubit, Hideo Kosaka, *Tohoku Univ., Yokohama National Univ., Japan*, Tuesday, 12:00-12:30page 102

FTu2A.1, Toward a Quantum Network based on Semiconductor Quantum Dots, Pascale Senellart, *CNRS-Laboratoire de Photonique et Nanost, France*, Tuesday, 14:00-14:30page 110

Symposium on Science and Applications of Structured Light in Complex Media

FW1C, Symposium on Science and Applications of Structured Light in Complex Media I, Wednesday, 10:30-12:30page 142

FW3C, Symposium on Science and Applications of Structured Light in Complex Media II, Wednesday, 16:30-18:30page 162

Invited

FW1C.1, Quantum Electromechanical Processes in Plasmonic Nanostructures, Nicholas Fang, *MIT, USA*, Wednesday, 10:30-11:00page 142

FW1C.4, Graphene Metadevices and Metamaterials for Linear and Nonlinear THz Applications, Bumki Min, *Korea Advanced Inst of Science & Tech, Korea, Republic of*, Wednesday, 11:30-12:00page 146

FW3C.1, Resonating Metasurface Photon and its Spin Manipulation, Xiaobo Yin, *Univ. of Colorado, Univ. of California, USA*, Wednesday, 16:30-17:00page 162

FW3C.4, Controlling Light Propagation in Optical Waveguides Using One Dimensional Phased Antenna Arrays, Nanfang Yu, *Columbia Univ., USA*, Wednesday, 17:30-18:00page 166