# Monday Morning January 3 2005

*Plenary Session*, George R. Welch, Chair

7:25 **George R. Welch**, *Texas A&M University,* Welcoming Remarks

7:30 **Herbert Walther**, *Max-Planck Institut für Quantenoptik*, "Recent Advances in Cavity Quantum Electrodynamics"

8:00 **Federico Capasso**, *Harvard University,* "New frontiers in quantum cascade laser research"

8:30 **Leonid Butov**, *University of California at San Diego,* "Experiments on Exciton Condensation and "Pattern Formation in Coupled Quantum Wells"

| | *Cavity QED*<br>Herbert Walther, Chair | *Quantum Cascade Laser Physics and Applications*<br>Federico Capasso, Chair | *Exciton Condensation in Semiconductors*<br>Leonid Butov, Chair | *Vibrational and Infrared Molecular Spectroscopy*<br>Alexei Sokolov, Chair |
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| 9:10 | **Thomas Becker**, *Max-Planck Institut für Quantenoptik,* "Cavity QED with the Micromaser: From Fock-State Generation to Phase Diffusion" | **Alexey Belyanin**, *Texas A&M University,* "Coherent nonlinear optics with quantum-cascade structures" | **Ronen Rapaport**, *Bell-Labs, Lucent Technologies*, "Excitons in luminescent rings and artificial traps" | **Paul Champion**, *Northeastern University,* "Exploring Low-Frequency Modes in Biomolecules Using Femtosecond Coherence Spectroscopy" |
| 9:30 | **Axel Scherer**, *California Institute of Technology,* "Photonic crystals - basics and prospects" | **Claire Gmachl**, *Princeton University,* "Intersubband transitions beyond QC lasers" | **Makoto Kuwata-Gonokami**, *University of Tokyo,* "Optical manipulation of cold excitons in a quantum degenerate regime" | **Nikolai Kalugin**, *Texas A&M University,* "Multi-phonon Infrared Spectra of thin polycrystalline films and monocrystals of dipicolinic acid" |
| 9:50 | **Chris Search**, *Stevens Institute of Technology,* "Quantum Atom Optics: Non-classical Dynamics of Matter-Waves Coupled to Light Fields" | **Cun-Zheng Ning**, *NASA Ames Center for Nanotechnology,* "Possibility of two-photon lasing using intersubband transitions in semiconductor nanostructures" | **Jim Wolfe**, *University of Illinois at Urbana-Champaign,* "Excitons in Cu2O, To BEC or not to BEC?" | **Aleksander Rebane**, *Montana State University,* "1-2-3 photon spectroscopy of NLO chromophores" |

— Break —

*Plenary Session*, David H. Hughes, Chair

10:30 **David Hyland**, *Texas A&M University,* "Quantum Optics and Exosolar Planet Detection"

11:00 **Yoshihisa Yamamoto**, *Stanford University,* "Condensate of Polaritons in Microcavities"

| | *Novel Optics*<br>David Hyland, Chair | *Quantum Cascade Laser Physics and Applications*<br>Alexey Belyanin, Chair | *Exciton Condensation in Semiconductors*<br>Yoshihisa Yamamoto, Chair | *Entanglement, Correlations, and Complementarity*<br>Jon Sjogren, Chair |
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| 11:40 | **Michael G. Littman**, *Princeton University,* "Beating Diffraction with a Binary Mask – Shaped Pupil Coronagraph and the Optical Search for Planets about Nearby Stars" | **J. Barry McManus**, *Aerodyne Research, Inc.*, "Trace gas measurements using pulsed QC lasers: atmospheric and environmental applications" | **Leonid Levitov**, *Massachusetts Institute of Technology,* "theory of exciton condensation and pattern formation in coupled quantum wells" | **Alfred U'Ren**, *CISESE,* "Applied Photon Entanglement with Multi-Element Sources" |
| 12:00 | **Joe Mait**, *U.S. Army Research Laboratory,* "A Historical Perspective of Imaging" | **Tanya L. Myers**, *Pacific Northwest National Laboratory,* "Quantum Cascade Laser Transmitters for Sensors and Other Applications" | **Allan MacDonald**, *University of Texas at Austin,* "Excitonic Bose Condensation in Quantum Hall Bilayers" | **John Howell**, *University of Rochester,* "Time-Energy EPR Entanglement" |
| 12:20 | **Elena Kuznetsova**, *Texas A&M University,* "Solitary waves in amplifying media with excited-state absorption" | **Gottfried Strasser**, *Technical University of Wien,* "Surface emitting quantum cascade lasers" | **Loren Pfeiffer**, *Bell Laboratories*, "Design considerations of GaAs samples intended to demonstrate excitonic BEC" | **Mark Hillery**, *Hunter College, CUNY,* "Discriminating multipartite states" |
| 12:40 | **Leon Cohen**, *City University of New York (Hunter College),* "Time-Frequency Evolution of the Quantum Langevin Equation" | | | **Margaret Reid**, *University of Queensland, Australia,* "Criteria for entanglement of macroscopic superpositions" |

# Monday Evening January 3 2005

*Plenary Session*, M. Howard Lee, Chair

19:00 **William G. Unruh**, *University of British Columbia, Vancouver,* "Dumb Holes and Slow light– Testing Black Hole Physics in the Lab"

19:30 **Daniel J. Gauthier**, *Duke University,* "New techniques for ultra-low light-level nonlinear optics"

20:00 **Peter S. Pershan**, *Harvard University,* "X-ray optics of liquid surfaces"

— Break —

| | *Quantum Field Theory in Curved Space*<br>Howard Brandt, Chair | *Ultra-Low-Light Level Nonlinear Optics*<br>Daniel J. Gauthier, Chair | *Novel Optics*<br>John Howell, Chair | *Femtosecond Dynamics*<br>Zoe-Elizabeth Sariyanni, Chair |
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| 20:50 | **Leonard Parker**, *University of Wisconsin at Milwaukee,* "Cosmology and Quantum Field Theory in the Curved Spacetime of General Relativity" | **Danielle Braje**, *Stanford University,* "Nonlinear Optics Using Electromagnetically Induced Transparency in Cold Atoms" | **Kevin Lehmann**, *Princeton University,* Cavity Ring-down Spectroscopy | **Stefanie Gräfe**, *Wuerzburg University, Germany,* "Instanteneous dynamics and quantum control fields: principle and numerical applications" |
| 21:10 | **Stephen A. Fulling**, *Texas A&M University,* "Review of some recent work on acceleration radiation" | **Jeff Lundeen**, *University of Toronto,* "Applications of a nonlinear photon switch to Hardy's Paradox and Bell-state determination" | **George R. Welch**, *Texas A&M University,* "Enhanced coupling between optical and sound waves in the forward direction via ultra-slow light" | **Kazuhiko Misawa**, *Tokyo University of Agriculture and Technology,* "Real-time wave-packet dynamics and wave-packet engineering" |
| 21:30 | **Chris Adami**, *Keck Graduate Institute/Caltech,* "Black holes conserve information in curved-space quantum field theory" | **Min Xiao**, *University of Arkansas,* "All-optical switching with enhanced Kerr nonlinearity in EIT system" | **Raanan Tobey**, *University of Colorado,* "Nonlinear High-Frequency Photoacoustic Spectroscopy using EUV Light | **Jaan Laane**, *Texas A&M University,* "Spectroscopic Investigations of Molecular Structures in Electronic Excited States" |
| 21:50 | **Paul M. Alsing**, *Air Force Research Laboratory,* "Ion Trap Simulation of theUnruh Effect" | **Alex Kuzmich**, *Georgia Institute of Technology,* "Quantum networking with atomic ensembles" | **Kyungsun Na**, *University of Texas at Austin,* "Chaos Assisted STIRAP" | **Roland E. Allen**, *Texas A&M University,* "Response of benzene and dipicolinic acid to ultrafast laser pulses" |

# Tuesday Morning January 4 2005

*Plenary Session*, Olga Kocharovskaya, Chair

7:30 **Sune Svanberg**, *University of Lund, Sweden,* "Diagnostics and treatment of tumours using laser techniques"

8:00 **Gérard Mourou**, *U. of Michigan and LOA ENSTA/Ecole Polytechnique Fr.,* "Relativistic Optics"

8:30 **Stephen E. Harris**, *Stanford University,* "Fourier Synthesis of Optical Waveforms"

| | *Laser Medical Diagnostics*<br>Sune Svanberg, Chair | *Relativistic Optics*<br>Gérard Mourou, Chair | *Laser Optics*<br>Stephen E. Harris, Chair | *Femtosecond Dynamics*<br>Vladimir A. Sautenkov, Chair |
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| 9:10 | **Hans Hertz**, *Royal Institute of Technology, Stockholm,* "Sources and optics for table-top biomedical x-ray imaging" | **Michael Key**, *Lawrence Livermore National Laboratory,* "Physics of the fast Ignitor" | **Alexei Sokolov**, *Texas A&M University,* "Toward powerful single-cycle laser pulses" | **Manjusha Mehendale**, *Princeton University,* "All UV time resolved coherent anti-Stokes Raman scattering" |
| 9:30 | **Gordon Cates**, *University of Virginia,* "Progress using Laser Polarized Noble Gases for Magnetic Resonance in Medicine" | **Kim Ta Phuoc**, *LOA ENSTA/Ecole Polytechnique Fr.,* "Generation of X-ray beams using lasers from the accelaration of energetic electrons" | **Masayuki Katsuragawa**, *University of Electro-Communications, Japan,* "Ultrashort pulse generation using coherent molecular oscillation" | **Joseph Giordmaine**, *Princeton University,* "Slowing the dephasing of molecular coherence" |
| 9:50 | **Irving Bigio**, *Boston University,* "Optical biopsy: noninvasive detection of cancer with elastic-scattering spectroscopy" | **Frank Caroll**, *Vanderbilt U. Medical Center,* "Applications of High Intensity laser-based X-ray imaging and therapy" | **Chandrasekhar Roychoudhuri**, *University of Connecticut,* "Measuring properties of superposed light beams carrying different frequencies" | **Barak Dayan**, *Weizmann Institute of Science, Israel,* "Nonlinear interactions with entangled photons and high-power down-converted light" |

— Break —

*Plenary Session*, Kotik Lee, Chair

10:30 **Eric Mazur**, *Harvard University,* "Wrapping light around a hair"

11:00 **Lute Maleki**, *Jet Propulsion Laboratory,* "Hyper parametric oscillation and squeezing in crystalline whispering gallery mode resonators"

| | *Nanophotonics I*<br>Eric Mazur, Chair | *Relativistic Optics*<br>Gérard Mourou, Chair | *Quantum Metrology*<br>Andrey Matsko, Chair | *Microcavity enhancements in Semiconductor Lasers and LEDs*<br>Weng W. Chow, Chair |
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| 11:40 | **Naomi Halas**, *Rice University,* "Plasmonic Nanosensors" | **John Nees**, *University of Michigan,* "Relativistic Optics: A route to high intensity attosecond pulses" | **Derek Kimball**, *University of California at Berkeley,* "Can a Quantum Nondemolition Measurement Improve the Sensitivity of an Atomic Magnetometer?" | **Connie Chang-Hasnain**, *University of California at Berkeley,* "50GHz VCSEL - no speed limit in sight" |
| 12:00 | **Michal Lipson**, *Cornell University,* "Manipulating light using highly confining nanophotonic structures" | **Wim Leemans**, *Lawrence Berkeley National Laboratory,* "Laser Plasma-based accelerators: their potential for High Energy Physics" | **Eugeniy Mikhailov**, *Massachusetts Institute of Technology,* "Development of a stable low-frequency squeezed vacuum source for precision position measurement" | **Dennis G. Deppe**, *University of Texas at Austin,* "Lithographically defined all epitaxial grating confined VCSELs and their applications to quantum-optics experiments" |
| 12:20 | **Kerry Vahala**, *California Institute of Technology,* "Q $>$ 100-million optical microresonators on silicon and applications" | **Jean-Claude Kieffer**, *INRS Canada,* "Phase contrast radiography with Ultrafast laser based X-ray source alser baser" | **Alexander Korotkov**, *University of California at Riverside,* "Quantum feedback control in solid-state mesoscopics" | **Kent Choquette**, *University of Illnois,* "Vertical Cavity Photonic Crystal Lasers" |
| 12:40 | **Elinor Irish**, *University of Rochester,* "Quantum Electro-Mechanics: Cavity QED beyond the rotating-wave approximation" | | **Irina Novikova**, *Harvard Smithsonian Center for Astrophysics,* "Study of the three-photon absorption resonances as a challenger for the atomic clock" | **Ihab El-kady**, *Sandia National Laboratory,* "Thermal emission from photonic crystals: Does it exceed blackbody radiation?" |

# Tuesday Evening January 4 2005

*Plenary Session*, Robert Boyd, Chair

19:00 **Paul Brumer**, *University of Toronto*, "Coherent Control of Radiationless Transitions"

19:30 **Wolfgang Schleich**, *Universität Ulm*, "New Frontiers in General Relativity"

20:00 **Jacob Khurgin**, *Johns Hopkins University*, "Parametric Slow Light Structures"

— Break —

| | *New Directions in Coherent Control*<br>Paul Brumer, Chair | *Relativity and Optics*<br>Wolfgang Schleich, Chair | *Slow Light Applications*<br>Jacob Khurgin, Chair | *Nanophotonics II*<br>Nikolai Kalugin, Chair |
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| 20:50 | **Ioannis Thanapoulos**, *University of British Columbia and*, "Coherent Control of Nucleotide Base Pair Mutations" | **Ernst Rasel**, *Universität Hannover*, "Atom optics on ground and in space" | **Yifu Zhu**, *Florida International University*, "Nonlinear wave mixing with EIT in cold atoms" | **Evgenii E. Narimanov**, *Princeton University*, "Chaotic Microlasers Based on Dynamical Anderson Localization" |
| 21:10 | **Matthais Wollenhaupt**, *Universität Kassel*, "Quantum Control Using Intense Shaped Pulses" | **Ignazio Ciufolini**, *Universita' di Lecce, Italy*, "Accurate measurement of frame-dragging using the LAGEOS satellites and the GRACE Earth gravity models" | **Art Smirl**, *University of Iowa*, "Stopping, Trapping and Releasing Light in Doubly-Resonant Nanostructures" | **Viktor A. Podolskiy**, *Oregon State University*, "Nanostructured non-magnetic left-handed composites" |
| 21:30 | **Victor S. Batista**, *Yale University*, "Creating and Manipulating Electronic Coherences in Functionalized Seminconductor Nanostructures" | **Francis Everitt**, *Stanford University*, "Gravity Probe B On-Orbit: Processing the Science Data" | **De-Kui Qing**, *Texas A&M University*, "Delay-Time-Bandwidth Product in Slow Light" | **Jean-Pierre Leburton**, *University of Illinois at Urbana-Champaign*, "Charge stability and exchange engineering in coupled quantum dots" |
| 21:50 | **Petr Kral**, *University of Illinois at Chicago*, "Control of catalytic activity of proteins in vivo" | **Ulrich Schreiber**, *Universität Essen*, "Beyond the 6th decimal – High Precision Sagnac Interferometry" | **Alexander Gaeta**, *Cornell University*, "Slow Light in Optical Fibers" | **Sang-Kee Eah**, *The University of Chicago and Argonne*, "Scattered light interference of a single metal nanoparticle and its mirror image" |

# Wednesday Morning January 5 2005

*Plenary Session,* Linda Reichl, Chair

7:30 **Vladimir M. Shalaev**, *Purdue University,* "Plasmonic Nanophotonics: Coupling Light to Nanoscale via Plasmons"

8:00 **John Pendry**, *Imperial College,* "Metamaterials Open New Vistas in Optics"

8:30 **Mike Romalis**, *Princeton University,* "High-density alkali-metal magnetometers and their applications"

| | *Plasmonic Nanophotonics*<br>John Pendry, Chair | *Electron Waveguides*<br>Jonathan P. Dowling, Chair | *Magnetometry*<br>Dmitry Budker, Chair | *Biophysics and Biochemistry*<br>Gerard Wysocki, Chair |
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| 9:10 | **Gennady Shvets**, *University of Texas at Austin,* "Band engineering using electrostatic resonances: applications to super-lensing" | **Linda Reichl**, *University of Texas at Austin,* "Electron waveguide quantum computers" | **Peter Schwindt**, *NIST, Boulder,* "Microfabricated Atomic Magnetometers" | **James Weaver**, *Massachusetts Institute of Technology,* "Transport, sources and sinks: A multiscale, modular approach to modeling systems in biology and medicine" |
| 9:30 | **Harry Atwater**, *California Institute of Technology,* "Strong Coupling in Plasmonic Materials" | **Jonathan Bird**, *SUNY at Buffalo,* "Electron Waveguides for Quantum Computing: Spin & Wave-Based Approaches" | **Frank Narducci**, *Naval Air Systems Command,* "Atomic Magnetometry with Laser-Trapped Atoms" | **Timothy F. Havel**, *Massachusetts Institute of Technology,* "Some Connections between Protein NMR Spectroscopy and NMR Quantum Computing" |
| 9:50 | **Ildar Gabitov**, *University of Arizona,* "Nonlinear electrodynamics of ultrashort pulses in a medium with negative refractive index" | **Charles Stafford**, *University of Arizona,* "Spontaneous formation of nanoscale electron waveguides" | **Chris Hovde**, *Southwest Sciences,* "Earth-Field Atomic Magnetometry with Frequency-Modulated Light" | **Eric O. Potma**, *Harvard University,* "Biology seen through the window of CARS" |

— Break —

*Plenary Session,* Marlan O. Scully, Chair

10:30 **Award Lamb Medal**, "The presentation of the 2005 Willis E. Lamb medal for Laser Science and Quantum Optics"

11:00 **Mark Raizen**, *University of Texas at Austin,* "Quantum Dynamics and Transport in Low-Dimensional Bose Gases"

| | *Plasmonic Nanophotonics*<br>Vladimir M. Shalaev, Chair | *Low Dimensional Quantum Gases*<br>Mark Raizen, Chair | *Magnetometry and Quantum Metrology*<br>Frank Narducci, Chair | *Laser Microtexturing*<br>Eric Mazur, Chair |
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| 11:40 | **Mikhail Noginov**, *Norfolk State University,* "Effect of silver nanoparticles on luminescence of Eu3+ ions in organic and inorganic materials" | **David S. Weiss**, *Pennsylvania State University,* "Observation of a 1D Tonks-Girardeau gas" | **Antoine Weis**, *Université de Fribourg,* "The human heart beat seen by cesium magnetometers" | **Andreas Ostendorf**, *Laser Zentrum Hannover,* "Patterning of silicon surfaces by ps and fs laser pulses" |
| 12:00 | **Mark I. Stockman**, *Georgia State University,* "Coherent, nonlinear, and quantum nanoplasmonics" | **Maxim Olshanii**, *University of Southern California,* "Interatomic Interactions and Interference" | **Andrey Matsko**, *Jet Propulsion Laboratory,* "Magnetometer based on the opto-electronic microwave oscillator" | **Peter Herman**, *University of Toronto,* "Ultrafast laser processing: controlling heat accumulation effects with variable repetition rate" |
| 12:20 | **Sergey Bozhevolnyi**, *University of Aalborg, Denmark,* "Polaritonics: photonics based on surface plasmon polaritons" | **Daniel J. Heinzen**, *University of Texas at Austin,* "Superfluid and insulating states of a Bose gas in an optical lattice" | **Dmitry Budker**, *University of California at Berkeley,* "Selective addressing and applications of high-order atomic polarization moments" | **Stephen Jesse**, *Oak Ridge National Lab / UTK,* "Modelling the evolution of surface micro-structures on laser irradiated silicon" |
| 12:40 | **Michael Scalora**, *U.S. Army Aviation and Missile Command,* "Negative Refraction of Ultrashort Electromagnetic Pulses" | **Peter Drummond**, *University of Queensland, Australia,* "Atoms in optical lattices and the Fermi sign problem" | **Dmitry V. Strekalov**, *Jet Propulsion Laboratory,* "Quantum-correlation metrology with biphotons: where is the limit?" | **Steve Yalisove**, *University of Michigan,* "Ultrafast laser interaction with Si-SiO2 interfaces" |

## Wednesday Evening January 5 2005

*Plenary Session,* Paul Corkum, Chair

19:00 **Peter D. Keefe**, *Keefe & Associates,* "Does the Adiabatic First Order Phase Transition of a Type I Superconductor Particle Pose a Quantum Limit to the Second Law?"

19:30 **Olga Kocharovskaya**, *Texas A&M University,* "Laser manipulations of nuclear transitions"

20:00 **James Franson**, *Johns Hopkins University,* "Linear Optics Quantum Computing"

— Break —

| | *Plasmonic Nanophotonics*<br>Mikhail Noginov, Chair | *Gamma-ray Optics*<br>James J. Carroll, Chair | *Quantum Crypto/Comp*<br>James Franson, Chair | *Novel Optics*<br>Peter D. Keefe, Chair |
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| 20:50 | **Mark Brongersma**, *Stanford University,* "Towards CMOS Compatible Nanophotonics and Plasmonics" | **Esen E. Alp**, *Argonne National Laboratory,* "Inelastic X-Ray Scattering Techniques and Their Applications" | **Jonathan P. Dowling**, *Louisiana State University,* "Quantum Optical Sensing, Imaging, and Computing" | **Xinyong Fu**, *Shanghai Jiao Tong University,* "Realization of Maxwell's Hypothesis" |
| 21:10 | **Vladimir P. Drachev**, *Purdue University,* "Nonlinear Spectroscopy of Metal Quantum Dots" | **David Reis**, *University of Michigan,* "Picosecond resolved x-ray scattering" | **Todd B. Pittman**, *Johns Hopkins University,* "Heralding single photons from pulsed down-conversion" | **Marlan O. Scully**, *Texas A&M University,* "Using Quantum Mechanics to Exorcise Maxwell's Demon" |
| 21:30 | **Peter G. Kik**, *CREOL, University of Central Florida,* "Resonant near-field excitation of surface plasmons for applications in imaging and optical interconnects" | **Ian McNulty**, *Argonne National Laboratory,* "X-ray coherence and microscopy" | **Howard Brandt**, *ARL,* "Design for a Quantum Cryptographic Entangling Probe" | **Goong Chen**, *Texas A&M University,* "Generalized Two-Centered Orbitals in the Modeling of Diatomic Molecules and Relevant Asymptotics" |
| 21:50 | **Karl L. Kompa**, *Max-Planck Institut für Quantenoptik,* "Molecules as Nanoscopic Information Devices" | **John Miao**, *University of California at Los Angeles,* "Coherent Imaging and Its Applications" | **Philip Hemmer**, *Texas A&M University,* "VLSI quantum computer in diamond" | **Mark D. Havey**, *Old Dominion University,* "Mesoscopic Wave Dynamics in Ultracold Atomic Rb" |

# Thursday Morning January 6 2005

*Plenary Session*, Richard Miles, Chair

7:30 **Szymon Suckewer**, *Princeton University*, "X-Ray Lasers via Optical Field Ionization"

8:00 **Joseph W. Haus**, *University of Dayton*, "Nanophotonics"

8:30 **Vitaly Kocharovsky**, *Texas A&M University*, "Interband Nonlinear Mixing Lasers for Mid/Far-Infrared Generation"

| | *What's New in Field of X-Ray Lasers*<br>Szymon Suckewer, Chair | *Nanophotonics III*<br>Joseph W. Haus, Chair | *Semiconductor Optoelectronics*<br>Vitaly Kocharovsky, Chair | *Entanglement, Correlations, and Complementarity*<br>George R. Welch, Chair |
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| 9:10 | **Jorge Rocca**, *Colorado State University*, "High repetition rate table-top and desk-top size soft x-ray lasers" | **Edward (Ted) Sargent**, *Univeristy of Toronto*, "Infrared Colloidal Quantum Dots: Electroluminescent, Photovoltaic, and Modulation Devices" | **Henryk Temkin**, *Texas Tech University*, "Semiconductor Light Sources for the Ultraviolet" | **Vincenzo Savona**, *Swiss Federal Institute of Technology-Lausanne*, "Quantum complementarity of microcavity polaritons" |
| 9:30 | **Jonathan S. Wurtele**, *University of California at Berkeley*, "Ultra-high intensity femtosecond laser via Raman Amplification for X-Ray Lasers" | **Steve Blair**, *University of Utah*, "Molecular detection and nonlinear optics with metallic nanocavities" | **Junichiro Kono**, *Rice University*, "Optical Signatures of the Aharonov-Bohm Phase in Carbon Nanotubes" | **Arthur Dogariu**, *NEC Laboratories America*, "Correlated photons via cascaded four-wave mixing in microstructured fiber" |
| 9:50 | **Yoav Avitzour**, *Princeton University*, "Possibility for compact recombination XRLs using Optical Field Ionization" | **Mark Baldo**, *Massachusetts Institute of Technology*, "Molecular circuits from Photosynthetic complexes" | **Scott Crooker**, *Los Alamos National Laboratory*, "Imaging electron spin flows in semiconductors in the presence of electric, magnetic, and strain fields" | **Edward S. Fry**, *Texas A&M University*, "Nonlocality in Quantum Mechanics" |

— Break —

*Plenary Session*, Phillip Szuromi, Chair

10:30 **Richard Miles**, *Princeton University*, "Spectral Methods for Imaging High-Speed Fluid Flow"

11:00 **Wolfgang Kiefer**, *Wuerzburg University, Germany*, "Femtosecond coherent four-wave mixing spectroscopy and applications"

| | *What's New in Field of X-Ray Lasers*<br>Szymon Suckewer, Chair | *Nanophotonics III*<br>Steve Blair, Chair | *Femtosecond Spectroscopy*<br>Wolfgang Kiefer, Chair | *Quantum Imaging*<br>Edward S. Fry, Chair |
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| 11:40 | **Claudio Pellegrini**, *University of California at Los Angeles*, "Status of development of X-Ray FEL and some new ideas" | **Michael E. Crenshaw**, *US Army RDECOM*, "Quantum Electrodynamic Foundations of Continuum Electrodynamics" | **Torsten Siebert**, *Wuerzburg University, Germany*, "Optimizing population-transfer to excited vibrational states in femtosecond time-resolved coherent anti-stokes Raman Scattering for enhanced molecular recognition" | **Robert Boyd**, *University of Rochester*, "Progress in Quantum Lithography and Ghost Imaging" |
| 12:00 | **Marlan O. Scully et al.**, *Texas A&M University*, "Charge-Exchange X-Ray Lasers" | **Edo Waks**, *Stanford University*, "Single Photon Sources" | **Vladimir A. Sautenkov**, *Texas A&M University*, "UV coherent absorption spectroscopy for anthrax" | **Giuliano Scarcelli**, *UMBC*, "Quantum imaging using thermal and Raman photon pairs" |
| 12:20 | | **Geoffrey Hunter**, *York University*, "Experimental Confirmation of the Photon as an Ellipsoidal Soliton" | **Yuri Rostovtsev**, *Texas A&M University*, "Electromagnetically Induced Coherent Scattering (EICS) in Backward Direction" | **Fuli Li**, *Texas A&M University*, "Coherence induced entanglement" |
| 12:40 | | **Nan Yu**, *Jet Propulsion Laboratory*, "Ultra-low noise optical pulse generation through regenerative Q of the mode-locked laser" | **Guy Beadie**, *Naval Research Laboratory*, "CARS Detection: How Can We Optimize Sensitivity?" | **Manfred Kleber**, *Technische Universität München*, "Imaging Atoms with Evanescent Waves" |

## Thursday Evening January 6 2005

*Plenary Session,* Philip Hemmer, Chair

19:00 **Gerd Leuchs**, *University of Erlangen, Germany,* "Continuous Variable Quantum Algorithms"

19:30 **Norbert Kroó**, *Hungarian Academy of Sciences,* "Near field microscopy with surface plasmons and their statistical properties"

20:00 **Paul Corkum**, *National Research Council of Canada,* "Attosecond Imaging: Using a Molecule's own Electrons to Image Molecular Orbitals"

— Break —

| | *Quantum Algorithms*<br>Gerd Leuchs, Chair | *Gamma-ray Optics*<br>Esen E. Alp, Chair | *Novel Optics*<br>Norbert Kroó, Chair | *CARS Spectroscopy*<br>Yuri Rostovtsev, Chair |
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| 20:50 | **Oliver Gloeckl**, *University of Erlangen, Germany,* "From phase measurements on intense light beams to entanglement generation by spatial separation of quantum sidebands" | **James J. Carroll**, *Youngstown University,* "An experimental perspective on releasing energy from nuclear isomers" | **Gerard Wysocki**, *Rice University,* "Quantum cascade laser based trace-gas sensors for human breath analysis" | **Zoe-Elizabeth Sariyanni**, *Texas A&M University,* "Femtosecond CARS on molecules: Gaining Insight from a Theoretical Analysis" |
| 21:10 | **Julien Niset**, *Ecole Polytechnique and Universite Libre de Bruxelles,* "Quantum cloning with continuous variables" | **Douglas Cline**, *University of Rochester,* "Nuclear structure studies of nuclear isomers and implications for controlled energy release" | **Fam Le Kien**, *University of Electro-Communications, Japan,* "Atom traps and waveguides using evanescent light fields around subwavelength-diameter fibers" | **Robert Lucht**, *Purdue University,* "Nonperturbative Modeling of Coherent Anti-Stokes Raman Scattering with Ultrafast Lasers" |
| 21:30 | **Matt Eisaman**, *Harvard University,* "Quantum Control of Single Photons using Electromagnetically Induced Transparency" | **Roman Kolesov**, *Texas A&M University,* "Influence of electromagnetic radiation on the Mossbauer spectra through co-dopants." | **Anil K. Patnaik**, *Texas A&M University,* "Raman Photon Pair Correlations Via the Onsager Regression Theorem" | **Dmitry Pestov**, *Texas A&M University,* "Femtosecond CARS on organic molecules" |
| 21:50 | | **Petr Anisimov**, *Texas A&M University, "* "Magic-angle" technique for suppression of inhomogeneous broadening of Mossbauer spectra" | **Michel de Haan**, *Université Libre de Bruxelles,* "Field theory reformulated without self-energy parts" | **Chong H. (Raymond) Ooi**, *Texas A&M University,* "Enhanced Nonlinear CARS Backscattering via Quantum Coherence for Remote Detection of Anthrax Spores" |