

Monday Morning, January 5 2009

Plenary Session, George R. Welch, Chair

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

7:30 **Bernhard W. Adams**, *Argonne National Laboratory*, “Nuclear Gamma-Ray Superradiance”

8:00 **Leonid Butov**, *University of California at San Diego*, “Indirect Excitons”

8:30 **Barry C. Sanders**, *University of Calgary*, “Complete Characterization of Quantum-Optical Processes”

Nuclear Gamma-Ray Superradiance

Bernhard W. Adams, Chair

9:10 **Ralf Röhlsberger**, *Deutsches Elektronen Synchrotron DESY*, “Directional Emission of X-rays from Rotating Matter: The Nuclear Lighthouse Effect”

9:30 **Yuri Shvyd'ko**, *Argonne National Laboratory*, “X-Ray Free Electron Laser Oscillator: a Future Fully Coherent X-ray Source”

9:50 **Jun-Tao Chang**, *Texas A&M University*, “Cooperative Spontaneous Emission of N atoms: many-body eigenstates and their decay”

10:10 **Eyob A. Sete**, *Texas A&M University*, “The Lamb Shift in Single photon Dicke Superradiance”

Exciton Condensates

Leonid Butov, Chair

Aron Pinczuk, *Columbia University*, “Quantum Hall States seen as Quantum Liquids”

Tomoyuki Horikiri, *National Institute of Informatics, Japan and Stanford University*, “Second order coherence of exciton-polariton condensates”

Rafi Bistritzer, *University of Texas at Austin*, “High Tc superfluidity in bilayer graphene”

Michael P. Lilly, *Sandia National Laboratories*, Coulomb drag in the exciton regime in electron-hole bilayers”

— Break —

Plenary Session, Alexey Belyanin, Chair

10:50 **Xiaoliang Sunney Xie**, *Harvard University*, “Single Molecule and Nonlinear Raman Microscopy for Biology and Medicine”

11:20 **Weng W. Chow**, *Sandia National Laboratories*, “Update on our understanding of semiconductor-laser gain: from quantum well to quantum dots”

Medical and Bio-Physics

Zoe-Elizabeth Sariyanni, Chair

12:00 **Szymon Suckewer**, *Princeton University*, “Flapless FemtosecLASIK”

12:20 **Markus Pollnau**, *University of Twente*, “Monitoring of DNA molecules in a lab on a chip with femtosecond laser written waveguides”

12:40 **George R. Welch**, *Texas A&M University*, “CARS and FAST-CARS detection of biological molecules such as glucose and cholesterol”

Quantum Mechanics and Number Theory

Anatoly Svidzinsky, Chair

Vincenzo Tamma, *University of Maryland, Baltimore County*, “Exponential Sums Algorithm based on Optical Interference: Factorization of arbitrary large numbers in a single run”

Mark Sadgrove, *CREST project, Japan Science and Technology Agency*, “Computing exponential sums with a Bose-Einstein condensate”

Elmar Haller, *Experimental Physik University of Innsbruck*, “From an ideal gas to the super-Tonks-Girardeau regime with tunable interactions”

Advances in Semiconductor Optics

Weng W. Chow, Chair

Alexey Belyanin, *Texas A&M University*, “Terahertz studies of collective excitations and microscopic physics in semiconductor magneto-plasmas”

Jacob Khurgin, *Johns Hopkins University*, “Interface roughness and ionized impurity broadening -is it homogeneous or not?”

Nikolai Stelmakh, *University of Texas at Arlington*, “Lateral mode structure of wide-ridge Quantum Cascade lasers”

Quantum Process Tomography

Barry C. Sanders, Chair

Masoud Mohseni, *Harvard University*, “Correlation-enhanced quantum process tomography”

Krister Shalm, *University of Toronto*, “The Symmetry of Spin-Squeezing: Quantum State Tomography on a Sphere”

Alexander Lvovsky, *University of Calgary*, “Process tomography of quantum-optical memory”

Martin Plenio, *Imperial College London*, “Measuring Measurement and Quantitative Entanglement Verification”

Quantum Coherence Effects

Dmitry Budker, Chair

Olga Kocharovskaya, *Texas A&M University*, “Quantum coherence effects in solids: New applications”

Holger Schmidt, *University of California at Santa Cruz*, “Atomic spectroscopy and quantum interference on a chip”

Ben Varcoe, *University of Leeds*, “Precision Test of Lorentz Invariance using EIT”

Monday Evening, January 5 2009

Plenary Session, Ian Osborne, Chair

19:00 **Gershon Kurizki**, *Weizmann Institute of Science*, “Ultrafast Cooling of Quantum Bits Within the Bath Memory”

19:30 **Ferdinand Schmidt-Kaler**, *Universität Ulm*, “A deterministic single ion source for nm-spatial deterministic doping of solid state devices”

20:00 **Geoffrey Duxbury**, *University of Strathclyde, Glasgow*, “Quantum cascade laser spectroscopy: Diagnostics to non-linear optics”

— Break —

Quantum Measurements, Decoherence and Dissipation

Gershon Kurizki, Chair

20:50 **Howard Carmichael**, *University of Auckland*, “Quantum teleportation of the temporal correlations of light: squeezing and bandwidth requirements”

21:10 **Hans J. Briegel**, *University of Innsbruck*, “Entanglement in biological systems? - A quantum thermodynamic perspective”

21:30 **Niels Kjaergaard**, *Niels Bohr Institute*, “Squeezing of Atomic Quantum Projection Noise”

21:50 **Nir Bar-Gill**, *Weizmann Institute of Science*, “Dynamic Decoherence Control in BEC Setups”

Cold Atoms and Solid State Physics

Ferdinand Schmidt-Kaler, Chair

(Change:)

Fedor Jelezko (talk delivered by Phil Hemmer), *University of Stuttgart*, “Manipulating single electron and nuclear spin in diamond”

József Fortágh, *University of Tübingen*, “Meissner effect in superconducting microtraps”

Björn Butscher, *University of Stuttgart*, “Observation of ultra-long-range Rydberg molecules”

Hans Peter Büchler, *University of Stuttgart*, “Quantum critical behavior in strongly interacting Rydberg gases”

Quantum Cascade Laser Spectroscopy:

Diagnostics to Non-Linear Optics

Geoffrey Duxbury, Chair

Damien Weidmann, *STFC Rutherford Appleton Laboratory*, “Broadband laser heterodyne spectroscopy using an external cavity quantum cascade laser”

Grant Ritchie, *University of Oxford*, “Applications of quantum cascade lasers in chemical kinetics and dynamics”

Rainer Martini, *Stevens Institute of Technology*, “High speed all-optical modulation of a Quantum Cascade Laser”

James F. Kelly, *DOE; Pacific Northwest National Laboratory*, “Empirical studies of swept gain effects in molecular lambda transitions”

Novel Optics

Vitaly Kocharovsky, Chair

Chan Joshi, *UCLA*, “Laser-Plasma Accelerators for Generating Directional X-ray beams”

Leon Cohen, *City University of New York (Hunter College)*, “A phase space approach to scattering”

Patrick Loughlin, *University of Pittsburgh*, “Local phase space moments of a pulse propagating with dispersion and damping”

M. Howard Lee, *University of Georgia*, “Ergodicity and Chaos in a system of harmonic oscillators”

Tuesday Morning, January 6 2009

Plenary Session, Virgil Sanders, Chair

7:30 **Marlan O. Scully**, *Texas A&M and Princeton University*, “The Lamb Shift Yesterday, Today, and Tomorrow”

8:00 **Paolo Tombesi**, *University of Camerino, Italy*, “Cooling and Entanglement in Cavity Optomechanics”

8:30 **Henry C. Kapteyn**, *JILA – University of Colorado at Boulder*, “Ultrafast Tabletop Diffractive Microscopy and Nanothermal Imaging using Coherent High Harmonic Beams”

Novel Nonlinear Optics

Vladislav V. Yakovlev, Chair

9:10 **Shaul Mukamel**, *University of California at Irvine*, “Nonlinear Spectroscopy with Entangled Photons; Manipulating Quantum Pathways of Matter”

9:30 **Kevin K. Lehmann**, *University of Virginia*, “Cavity Enhanced Absorption Spectroscopy with a Supercontinuum Source”

9:50 **Yuri Rostovtsev**, *Texas A&M University*, “Atomic coherence excited by off-resonant strong laser pulses: theory and experiment and the role of absolute phase”

Cavity Quantum Optomechanics

Paolo Tombesi, Chair

Jack Harris, *Yale University*, “Improved ‘position squared’ readout of a mechanical oscillator using degenerate cavity modes”

(Change:)

Simon Gröblacher, *IQOQI, Austrian Academy of Sciences*, “Laser-Cooling of Micromechanical Resonators in a Cryogenic Cavity”

Antoine Heidmann, *Laboratoire Kastler Brossel, CNRS*, “Optomechanical correlations between light and mirrors”

Attosecond Physics

Henry C. Kapteyn, Chair

John Miao, *University of California at Los Angeles*, “Lensless Diffraction Microscopy: Seeing the Invisible with Computational Algorithms”

Carmen Menoni, *Colorado State University*, “Nanometer scale imaging with extreme ultraviolet lasers”

Alexander A. Zholents, *Lawrence Berkeley National Laboratory*, “Array of free electron lasers for science with soft x-rays”

Novel Optics

Dmitry Strekalov, Chair

Aaron Leanhardt, *University of Michigan*, “An Electron Electric Dipole Moment Search in the 3 Δ 1 Ground State of Tungsten Carbide Molecules”

Anatoliy Savchenkov, *OEWaves Inc.*, “Low repetition rate all-optical frequency comb”

Eugeny Mikhailov, *The College of William & Mary*, “Low-frequency vacuum squeezing in Rb vapor”

— Break —

Plenary Session, Edward S. Fry, Chair

10:30 **Kohzo Hakuta**, *University of Electro-Communications, Japan*, “Manipulating Atoms and Photons Using Optical Nanofibers”

11:00 **Robin Kaiser**, *INLN, CNRS, UNSA*, “Quantum Multiple Scattering”

Nano-Quantum Optics

Kohzo Hakuta, Chair

11:40 **Dieter Meschede**, *University of Bonn*, “Controlling neutral atoms for quantum information processing in a 1D optical lattice”

12:00 **Misha Sumetsky**, *OFS Labs*, “Optical microcoil resonator”

12:20 **Takao Aoki**, *California Institute of Technology*, “Strong coupling between one atom and a microtoroidal resonator”

12:40 **Michal Bajcsy**, *Harvard University*, “All-optical switch inside a hollow-core photonic-crystal fiber”

Quantum Multiple Scattering

Robin Kaiser, Chair

Mark Havey, *Old Dominion University*, “Near-resonance light scattering in high density and ultracold 87Rb”

Thomas F. Gallagher, *University of Virginia*, “Superradiance in the Frozen Rydberg Gas”

Sebastian Slama, *University of Tübingen, Germany*, “Collective light scattering from ultracold atoms in optical cavities”

John Page, *University of Manitoba*, “Localization of ultrasonic waves in a three-dimensional elastic network”

Attosecond Recollision and Gating

Alexei Sokolov, Chair

Ladan Arissian, *Texas A&M University*, “Intracavity phase measurement, sensor based on carrier to envelope frequency (CEO)”

Eugene Frumker, *Texas A&M University*, “Two-dimensional phase-only spatial light modulators for dynamic phase and amplitude pulse shaping”

Carlos Trallero, *National Research Council, Canada*, “Multiphoton transitions in the strong field limit: From atoms to molecules”

David Grojo, *National Research Council, Canada*, “Multiphoton Ionization and Nanoscale Modifications inside Transparent Solids”

Quantum Information

Philip Hemmer, Chair

Margaret Reid, *Swinburne University of Technology*, “EPR, Steering and Bell inequalities”

Hannes Hübel, *University of Vienna*, “Entanglement based Quantum Cryptography: From intra city links to inter island quantum communication”

Michael Mehring, *Universität Stuttgart*, “Phase Control of Quantum States”

Edward S. Fry, *Texas A&M University*, “Do Experimental Violations of Bell Inequalities Imply a Non-Local Interpretation of Quantum Mechanics?”

Tuesday Evening, January 6 2009

Plenary Session, Margaret Murnane, Chair

19:00 **John Thomas**, *Duke University*, “Fermi Gases with Tunable Interactions”

19:30 **Eric Akkermans**, *Yale university and Technion-Israel*, “Dicke superradiance and Anderson localization of photons”

20:00 **Jorge J. Rocca**, *Colorado State University*, “Phase-coherent injection-seeded soft x-ray lasers”

— Break —

Interacting Fermi Gases

John Thomas, Chair

20:50 **Aurel Bulgac**, *University of Washington*, “The incredible many facets of a unitary Fermi gas”

21:10 **Peter D. Drummond**, *Swinburne University of Technology*, “Theory of strongly interacting Fermi gases”

21:30 **Ken O’Hara**, *The Pennsylvania State University*, “Experiments with an ultracold three-component Fermi gas”

21:50 **Cheng Chin**, *University of Chicago*, “Novel Quantum Phases and Scalable Quantum Control of Two Atomic Species in Optical Lattices”

Superradiance

Eric Akkermans, Chair

Eugene M. Chudnovsky, *CUNY Lehman College and Graduate Center*, “Cooperative Effects and Possibility of Superradiance in Crystals of Molecular Magnets”

Anatoly Svidzinsky, *Texas A&M University*, “Cooperative spontaneous emission of N atoms: effect of virtual photons and classical analogy with N harmonic oscillators”

Matthew Hastings, *Los Alamos National Laboratory*, “Synchronization and Dephasing of Many-Body States”

Karyn Le Hur, *Yale University*, “Entanglement and Decoherence of Two level Systems in a Boson bath: A unified Approach for solid-state devices, cold atomic systems, and photons”

Advances in Coherent Soft X-ray Sources

Jorge J. Rocca, Chair

Margaret Murnane, *JILA – University of Colorado at Boulder*, “Observing the Coupled Motions of Electrons and Atoms in Polyatomic Molecules”

Matthew Zepf, *Queen’s University Belfast*, “High harmonics from relativistically oscillating plasma surfaces – a high brightness attosecond source at keV photon energies”

Anne Sakdinawat, *University of California, Berkeley*, “X-ray Imaging with Specialized Diffractive Optics”

John Arthur, *SLAC*, “Startup of the LCLS Free Electron Laser and plans for soft X-ray science in 2009”

Ghost Imaging

Jon P. Davis, Chair

Yan Hua Shih, *University of Maryland at Baltimore County*, “Thermal ghost imaging: What is quantum? What is classical?”

Baris I. Erkmen, *NASA Jet Propulsion Laboratory*, “Unified theory of classical and quantum ghost imaging”

Shi-Yao Zhu, *Hong Kong Baptist University*, “Hanbury Brown-Twiss effect and thermal light ghost imaging”

Ronald Meyers, *Army Research Laboratory*, “Thermal Ghost Imaging Experiments”

Wednesday Morning, January 7 2009

Plenary Session, Yan Hua Shih, Chair

7:30 **Norbert Kroó**, *Hungarian Academy of Sciences*, “Nonlinear plasmonics and some applications”

8:00 **Robert W. Boyd**, *University of Rochester*, “Slow and Fast Light: Fundamentals and Applications”

8:30 **Robert L. Byer**, *Stanford University*, “Laser Compression and Acceleration of Electrons”

Surface Plasmons
Norbert Kroó, Chair

Slow Light

Robert W. Boyd, Chair

Laser Acceleration

Robert L. Byer, Chair

9:10 (*Changed:*)

Anatoly Zayats (talk delivered by **Viktor Podolskiy**), *The Queen's University of Belfast*, “Controlling Surface Plasmons on Nanostructured Surfaces”

John Howell, *University of Rochester*, “Applications of Slow And Stopped Light”

Ronald D. Ruth, *Lyncean Technologies, Inc. and SLAC*, “Accelerator-Laser Compton X-rays for medical applications”

9:30 **Francesco Intravaia**, *Universität Potsdam*, Surface Plasmons and the Casimir Effect”

Daniel J. Gauthier, *Duke University*, “Room-Temperature Spectral Hole Burning via SBS”

Eric R. Colby, *SLAC National Accelerator Laboratory*, “The E-163 Advanced Accelerator Research Program at SLAC”

9:50 **Peter Dombi**, *Hungarian Research Inst. for Solid-State Physics and Optics*, “Surface Plasmon Enhanced Electron Acceleration with Few-Cycle Laser Pulses”

Irina Novikova, *The College of William & Mary*, “Optimal control of light pulse storage and retrieval in atomic vapor”

Christopher McGuinness, *Stanford University*, “Accelerating Electrons with Lasers and Photonic Crystals”

— Break —

Plenary Session, Marlan O. Scully, Chair

10:30 **Lamb Award**, “The presentation of the 2009 Willis E. Lamb Award for Laser Science and Quantum Optics”

11:00 **Dan Stamper-Kurn**, *University of California at Berkeley*, “Magnetic phases of a dipolar spin-1 quantum gas”

Surface Plasmons

Norbert Kroó, Chair

Slow Light

Daniel J. Gauthier, Chair

Ultra-cold Dynamics

Dan Stamper-Kurn, Chair

Raman Route to Attoseconds

Ladan Arissian, Chair

11:40 **Miklos Lenner**, *Hungarian Research Inst. for Solid-State Physics and Optics*, “Nonlinear STM Plasmonics”

David A. B. Miller, *Stanford University*, “Limits to Dispersive and Slow Light Optical Devices”

Han Pu, *Rice University*, Dynamics of vector solitons in two-species atomic condensate”

Alexei Sokolov, *Texas A&M University*, “Novel Light Sources Utilizing Maximal Quantum Coherence in Molecular Gasses and Solids”

12:00 **Abdulahkem Y. Elezzabi**, *University of Alberta*, “Spinplasmonics: Controlling Plasmon Propagation via Electron Spin”

Herbert G. Winful, *University of Michigan*, “Tunneling time in photonic structures”

Peter Schmelcher, *University of Heidelberg*, “Correlated Tunneling and Interferences in Strongly Interacting Low-Dimensional Bosonic Systems”

Masayuki Katsuragawa, *University of Electro- Communications, Japan*, “Octave-spanning Raman comb stabilized to an optical frequency standard”

12:20 **Viktor A. Podolskiy**, *Oregon State University*, “Eliminating Losses and Out-of-Plane Scattering of Surface Plasmon Polaritons with Active Metamaterials”

Deniz Yavuz, *University of Wisconsin at Madison*, “Refractive index enhancement with vanishing absorption in an atomic vapor”

Lincoln Carr, *Colorado School of Mines*, “Many Body Entangled Quantum Dynamics of Ultracold Molecules”

Andy Kung, *Academia Sinica, Taiwan*, “Controlling the carrier-envelope phase of Raman generated single-cycle pulses”

12:40 (*Changed:*)

Andrey Krayev, *AIST-NT Inc.*, “SPM+Raman - Integrated Solution for Modern Photonics and Plasmonics”

Michelle Povinelli, *University of Southern California*, “Trapping Light in Optical Microcavities via Dynamic Tuning”

Hui-Chun Chien, *Stanford University*, “Observation of the Superfluid Deconfinement Crossover From 2D Berezinskii-Kosterlitz-Thouless Layers to a 3D Anisotropic Superfluid”

Fetah Benabid, *University of Bath*, “What Hollow-Core Photonic Crystal Fiber brought to Coherent Stimulated Raman Scattering”

Wednesday Evening, January 7 2009

Plenary Session, Vladislav V. Yakovlev, Chair

19:00 **Galina Khitrova**, *University of Arizona*, “Nonperiodic Nanophotonics”

19:30 **Alan Migdall**, *NIST Gaithersburg*, “Fiber-Based Entangled Photon Source Progress and Applications (a 2500 year history)”

20:00 **Hiro-o Hamaguchi**, *The University of Tokyo*, “Can Raman spectroscopy measure and quantify life?”

— Break —

Nonperiodic Nanophotonics

Galina Khitrova, Chair

20:50 **Alexandra Ledermann**, *Institute of Nanotech., Forschungszentrum Karlsruhe*, “Optical properties of three-dimensional photonic quasicrystals and their periodic approximants”

21:10 **Joshua R. Hendrickson**, *The University of Arizona*, “Exciton Polaritons in 1D Fibonacci Quasicrystals”

21:30 **Dagmar Gerthsen**, *University of Karlsruhe*, “Transmission Electron Microscopy of Nonperiodic InGaAs/GaAs Quantum Well Structures”

21:50 **Alexander N. Poddubny**, *Ioffe Physical-Technical Institute of the RAS*, “Theory of Light Coupled Exciton Polaritons in Nonperiodic Quantum Wells”

Quantum Information Processing

Alan Migdall, Chair

Alexander Korotkov, *University of California at Riverside*, “Quantum uncollapsing: theory and experiment”

John M. Myers, *Harvard University*, “Contingent choice of states to simplify a quantum decision problem of light detection”

Patrick Rebentrost, *Harvard University*, “The role of quantum coherence in excitonic energy transfer in photosynthetic complexes”

Howard Brandt, *U.S. Army Research Laboratory*, “Quantum computational geodesics”

Condensate Physics

Mark Havey, Chair

Vitaly Kocharovsky, *Texas A&M University*, “Mesoscopic BEC phase transition”

Randall G. Hulet, *Rice University*, “Exploring transport of a weakly-interacting BEC in a random potential”

Moochan Kim, *Texas A&M University*, “Condensation and Fluctuation for the weakly interacting N-Boson System”

Ron Folman, *Ben-Gurion University, Israel*, “Atomchips: where material engineering meets atom optics”

Raman Spectroscopy

Hiro-o Hamaguchi, Chair

George J. Thomas, *University of Missouri - Kansas City*, “Mechanisms of Virus Assembly Probed by Raman Spectroscopy”

Jaan Laane, *Texas A&M University*, “Spectroscopic investigations and potential functions for pyridine and 1,3-butadiene in ground and excited electronic states”

Lawrence Ziegler, *Boston University*, “Barcoding bacteria by surface enhanced Raman microscopy: rapid pathogen detection at the single cell level”

Vladislav V. Yakovlev, *University of Wisconsin at Milwaukee*, “Stimulated Raman scattering: old physics, new applications”

Thursday Morning, January 8 2009

Plenary Session, Eric Mazur, Chair

7:30 **Ofir E. Alon**, *Heidelberg University*, “Quantum Dynamics of Attractive Bose Gases”

8:00 **Mark Raizen**, *University of Texas at Austin*, “Maxwell’s Demon near Maximal Efficiency”

8:30 **Pierre Pillet**, *Laboratoire Aimé Cotton, CNRS, Univ Paris-Sud*, “Broadband laser for detection and cooling of molecules.”

Optical Lattices
Ofir E. Alon, Chair

Measurement, Cooling, and Maxwell’s Demon

Quantum Coherence Effects
Pierre Pillet, Chair

Novel Optics
Hichem Eleuch, Chair

9:10 **Ian Spielman**, *NIST, Gaithersburg*, “Realization of the Bose-Hubbard model in non-standard lattice potentials: tools, experiments, and a simple model”

Mark Raizen, Chair
Daniel Steck, *University of Oregon*, “All-Optical One-Way Barrier for Alkali Atoms”

Dmitry Budker, *University of California at Berkeley*, “The joy and utility of high-order atomic and nuclear polarization moments”

Kent D. Choquette, *University of Illinois*, “Decimated Cavity Photonic Crystal Membrane Laser”

9:30 **Congjun Wu**, *University of California at San Diego*, “Novel quantum phases in orbital systems with cold atom optical lattices”

Irfan Siddiqi, *University of California at Berkeley*, “Non-linear Dispersive Measurement with Superconducting Circuits”

Chris O’Brien, *Texas A&M University*, “Coherent Enhancement of Refractive Index in Solids using Excited State Absorption”

V. Ara Apkarian, *University of California at Irvine*, “Nonlocal mechanics, environment induced coherence, and decoherence free states of an oscillator strongly coupled to the bath”

9:50 **W. Vincent Liu**, *University of Pittsburgh*, “Crystalline superfluidity of cold atoms in lattice p-bands”

Nathaniel J. Fisch, *Princeton University Plasma Physics Laboratory*, “Cooling Particles with Waves: from 10^6 eV to 10^5 eV or from 10^{-8} eV to 10^{-9} eV”

Philippe Goldner, *Ecole Nationale Supérieure de Chimie*, “Rare earth doped crystals for quantum memories”

Eric Mazur, *Harvard University*, “Optically hyperdoped semiconductors”

10:10 **Nimrod Moiseyev**, *Technion, Israel*, “Photo induced conical intersections in molecular optical lattices: the phenomenon and its consequence”

Zoe-Elizabeth Sariyanni, *JILA / University of Colorado at Boulder*, “Exorcizing Maxwell’s Demon via Quantum Mechanics”

John J. L. Morton, *University of Oxford*, “Solid state quantum memory using nuclear spins”

Koryun Oganessian, *Yerevan Physics Institute, Armenia*, “Detection of Casimir Photons with Electrons”

— Break —

Plenary Session, Selim Shahriar, Chair

10:50 **Martin Richardson**, *Townes Institute, College of Optics, UCF*, “Playing with plasmas”

11:20 **Frank A. Narducci**, *Naval Air Systems Command*, “Useful Diagnostics in the construction of a Gradient Magnetometer Atom Interferometer”

Novel Nonlinear Optics
Martin Richardson, Chair

12:00 **Jason Fleischer**, *Princeton University*, “Nonlinear Self-Filtering via Dynamical Stochastic Resonance”

Measurements With Cold Atoms
Frank A. Narducci, Chair

Fredrik Fatemi, *Naval Research Laboratory*, “Imaging magnetic fields using stimulated Raman transitions in a cold atom cloud”

Quantum Coherence Effects
Olga Kocharovskaya, Chair

Selim Shahriar, *Northwestern University*, “Putting Superluminescence to Work: From Data Buffering to Ultraprecise Magnetometry”

Novel Optics
Yuri Rostovtsev, Chair

Andrii Sizhuk, *Texas A&M University*, “Fluctuations of Particle Number in Two-component Interacting Bose-Einstein Condensate”

12:20 **Alberto M. Marino**, *NIST*, “Entangled Images from Four-Wave Mixing”

Anthony Miller, *Stanford University*, “Magnetometry with Cold Atomic Ensembles”

Yifu Zhu, *Florida International University*, “Atomic coherence and interference in a coupled atom-cavity system”

Rina Kanamoto, *Ochanomizu University, Japan*, “Quantum phase transition, symmetry breaking, and entanglement in one-dimensional Bose gas”

12:40 **Douglas Stone**, *Yale University*, “Ab Initio Theory of Novel Micro and Nano Lasers”

Andy Geraci, *NIST*, “Cold atoms coupled to a magnetic micro-cantilever”

Dmitry Strekalov, *JPL/Caltech*, “Optical combs via cascaded four-wave mixing in a bichromatically pumped whispering gallery mode resonator”

Sabine Wölk, *Universität Ulm*, “Factorization with Gauss sums”

Thursday Evening, January 8 2009

Plenary Session, Anatoly Svidzinsky, Chair

19:00 **Andreas Volkmer**, *Universität Stuttgart*, “Coherent Raman microscopy: Exploring the chemical and physical structure of individual biopolymers, living cells, and tissue”

19:30 **Ernst M. Rasel**, *Leibniz Universität Hannover*, “Bose-Einstein condensates in extended free fall”

20:00 **Thomas Becker**, *Max Planck Institute for Quantum Optics*, “Cavity QED and Spectroscopy with Rydberg Atoms”

— Break —

Challenges in Imaging
Andreas Volkmer, Chair

Gravity and Relativity
Ernst M. Rasel, Chair

Quantum Nucleonics and Atomic-Nuclear Interactions

Atom-Photon Interactions
Thomas Becker, Chair

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| <u>20:50</u> | Gopalakrishnan Balasubramanian , <i>Universität Stuttgart</i> , “Super-resolution imaging using single spins in diamond” | Jason Hogan , <i>Stanford University</i> , “Precision gravimetry and test of the Equivalence Principle with a 10-meter atomic fountain” | Jonathan Wurtele, Chair
James J. Carroll , <i>Youngstown State University</i> , “Search for induced depletion of nuclear isomers” | Alexei Ourjountsev , <i>Max Planck Institute for Quantum Optics</i> , “Two-photon gateway in one-atom cavity quantum electrodynamics” |
| <u>21:10</u> | Keith Kastella , <i>SRI International</i> , “Selective detection of entangled photons” | Arnaud Landragin , <i>SYRTE-Observatoire de Paris</i> , “Inertial sensors with cold atoms” | Marc Litz , <i>U.S. Army Research Laboratory</i> , “Potential of electron-beam ionization for accelerated decay of radioisotopes” | Barak Dayan , <i>Weizmann Institute of Science</i> , “Routing single photons with single atoms coupled to chip-based microcavities” |
| <u>21:30</u> | Philip Hemmer , <i>Texas A&M University</i> , “Practical limits to sub-wavelength imaging” | Pacôme Delva , <i>ESA/ACT</i> , “Atom interferometric detection of gravitational waves on ground and in space” | Nino R. Pereira , <i>Ecopulse</i> , “Cost Estimates for Power or Energy from Nuclear Isomers” | Sanjit Karmakar , <i>University of Maryland, Baltimore County</i> , “Can two-photon interference of thermal light be considered as statistical correlation or anti-correlation of intensity fluctuations?” |
| <u>21:50</u> | Alexander A. Goyadinov , <i>University of Pennsylvania</i> , “Phaseless 3D Optical Tomography with Subwavelength Resolution” | Holger Müller , <i>University of California at Berkeley</i> , “Large area atom interferometry” | | |