6:00PM **Sunday, Jan. 5**, Evening Reception in honor of 2020 PQE heroes at Golden Cliff Room

Monday Morning January 6 2020

7:00 **Continental breakfast**

Plenary Session Olga Kocharovskaya, Chair

7:30 **Marlan Scully**, *Texas A&M University*, "A Brief History of Quantum Laser Theory"

8:00 **Donna Strickland**, *University of Waterloo*, "From Nonlinear Optics to High-Intensity Laser Physics"

8:30 **Chris Monroe**, *Institute for Quantum Information and Computer Science and University of Maryland*, "Quantum Control of Atomic-Like Systems with Light"

	Laser/PQE History	*Ultrafast Technology and Applications*	*Optical Control and Entanglement of Quantum Systems*	*Modern Problems in Quantum Electrodynamics*
	Marlan Scully, Chair	Donna Strickland, Chair	Chris Monroe, Chair	Haken Türeci, Chair
9:10	**Murray Sargent III**, *Microsoft*, "Growing up with Laser Theory"	**Franz Kärtner**, *DESY and Universität Hamburg*, "Terahertz Generation and Acceleration"	**Ania Jayich**, *TBA*, "TBA"	**Shanhui Fan**, *Stanford University*, "Thermal supercurrent in non-reciprocal near field electromagnetic heat transfer"
9:30	**Douglas Stone**, *Yale University*, "Aspects of Laser Theory in the 21st Century"	**Matthew Weidman**, *Ludwig Maximillian University and Max-Planck Institute for Quantum Optics*, "Towards Petahertz Electronics"	**Benjamin Bloom**, *Atom Computing, Inc.*, "Alkaline Earth Atom Arrays"	**Alejandro Rodriguez**, *Princeton University*, "Scattering bounds on spontaneous emission and Casimir–Polder forces in nanostructured media"
9:50	**Anatoly Svidzinsky**, *Texas A&M University*, "Master equation analysis of fluctuations in an interacting Bose gas"	**Jiahui Peng**, *Huazhong University of Science of Technology*, "Study of build-up dynamics of passive mode-locked lasers"	**James Chou**, *NIST*, "Coherent Control, High-Resolution Spectroscopy of a Single Molecular Ion, and Entanglement"	**Nicholas Roch**, *Université Grenoble Alpes*, "Observation of many-body zero-point fluctuations in superconducting circuits"
10:10	**Frank Wise**, *Cornell University*, "Spatiotemporal Mode-Locking"	**Aart Verhoef**, *Texas A&M University*, "Ultrafast fiber laser technology for high-field physics and high-speed nonlinear imaging"	**Julio Gea-Banacloche**, *NSF and University of Arkansas*, "AMO and Quantum Information Programs at The National Science Foundation"	**Hakan Türeci**, *Princeton University*, "Quantum Electrodynamics with non-Hermitian Modes"

10:30 — Break —

Plenary Session Linda Young, Chair

10:50 **Naomi Halas**, *Rice University*, "Nanomaterials and Light for Sustainability and Societal Impact"

11:20 **Olga Kocharovskaya**, *Texas A&M University*, "Quantum Optics with X-rays: Dynamical Control of Resonant Interaction"

	Plasmon-Enhanced Chemistry	*Quantum Optics with X-rays I*	*Third-Order Parametric Down-Conversion*	*Fundamentals of quantum mechanics*
	Naomi Halas, Chair	Olga Kocharovskaya, Chair	Maria Chekhova, Chair	Hichem Eleuch, Chair
12:00	**Steve Cronin**, *University of Southern California*, "Ultrafast Dynamics of Hot Electrons in Photocatalytic Nanostructures: Distinguishing the Influence on Interband and Plasmon Resonances"	**Linda Young**, *Argonne National Laboratory and The University of Chicago*, "Resonant propagation of x-rays from the linear to nonlinear regimes"	**Maria Chekhova**, *Max-Planck Institute for the Science of Light*, "Towards third-order parametric down-conversion in optical fibers"	**Leon Cohen**, *City University of New York*, "Quantum Methods Applied to Classical Systems"
12:20	**Jiming Bao**, *University of Houston*, "Production of long-chain hydrocarbons through CO_2 photothermal reduction using cobalt nanocrystals"	**Adriana Pálffy**, *Max-Planck-Institut für Kernphysik*, "Nuclear transitions for quantum control and metrology"	**Benoît Boulanger**, *Institute Néel*, "Triple photons"	**Shi-Yao Zhu**, *Zhejiang University*, "Generation of multicomponent atomic Schrödinger cat states of up to 20 qubits"
12:40	**Emiliano Cortés**, *Ludwig-Maximilians-Universität*, "Plasmonic chemical hotspots"	**Yuri Shvyd'ko**, *Argonne National Laboratory*, "Cavity-Based X-ray Free-Electron Lasers: Recent Developments"	**Christopher Wilson**, *University of Waterloo*, "Observation of Three-Photon Spontaneous Parametric Downconversion in a Superconducting Parametric Cavity"	**Godfrey Gumbs**, *Hunter College of the City University of New York*, "Many Many-Body effects on the optical absorption propertie sof α-$\mathscr{T}_3$ materials interacting with light"

Monday Evening January 6 2020

Plenary Session Alexey Belyanin, Chair

19:00 **Vladimir Shalaev**, *Purdue University*, "Plasmonic Metamaterials Meet Quantum"
19:30 **Da-Wei Wang**, *Zhejiang University*, "Topological phases of quantized light"
20:00 **Gennady Shvets**, *Cornell University*, "Time–Varying Metamaterials: A New Paradigm in Nonlinear and Active Photonics"

	Flat Optics Vladimir Shalaev, Chair	*Topological Quantum Optics* Da-Wei Wang, Chair	*Designer Metamaterials and Metasurfaces for Nonlinear Optics* Gennady Shvets, Chair	*Plasmon-Enhanced Processes* Naomi Halas, Chair
20:50	**Jelena Vuckovic**, *Stanford University*, "Inverse Design of large-scale practical photonic circuits"	**Oded Zilbergerg**, *ETH Zurich*, "Dimensional reduction, topological pumps, and topological quasicrystals"	**Pierre Berini**, *University of Ottawa*, "Plasmonic heptamer-arranged nano-hole arrays"	**Prineha Narang**, *Harvard University*, "Cavity Control of Transformations in Quantum Matter"
21:10	**Bob Boyd**, *University of Ottawa*, "Functionalized metasurfaces on an epsilon-near-zero platform"	**Han Cai**, *Zhejiang University*, "Manipulate the Localization Length of Flatband in Thermal Vapor"	**Ritesh Agarwal**, *TBA*, "TBA"	**Shunping Zhang**, *Wuhan University*, "Nonlinear Nanophotonics based on Surface Plasmon Polaritons"
21:30	**Noah Rubin**, *Harvard University*, "Matrix Fourier optics and compact full-Stokes polarization imaging with metasurfaces"	**Edo Walks**, *University of Maryland*, "Topological photonics with quantum light and synthetic gauge fields"	**Augustine Urbas**, *Air Force Research Laboratory*, "Controlling nonlinear generation via multipolar interference"	**Alessandro Alabastri**, *Rice University*, "Nanoscale heating for macroscale challenges: light harvesting for water desalination"
21:50	**Andrei Faraon**, *California Institute of Technology*, "Metaoptics: from 2D and 3D"	**Zheng-Wei Zhou**, *University of Science and Technology of China*, "Simulating and manipulating topological physics in photonics synthetic dimensions"	**Natalia Lichinitser**, *TBA*, "TBA"	**Teri Odom**, *Northwestern University*, "Conformal Quantum Emitters Coupled to Plasmonic Lattices"
22:10	**Patrice Genevet**, *Université Côte d'Azur*, "Applications and integration of semiconductor-based Metasurfaces"	**Gediminas Juzeliunas**, *Vilnius University*, "Geometric phases and spin-orbit coupling for periodically driven systems"	**Hayk Harutyunyan**, *Emory University*, "Nonlinear Chiral Response of Plasmonic Hybrid Metasurfaces"	**Hongxing Xu**, *Wuhan University*, "Ultrasensing optical spectroscopy of plasmonic nanocavity"

Tuesday Morning January 7 2020

7:00 **Continental breakfast**

Plenary Session Weng Chow, Chair

7:30 **Peter Nordlander**, *Rice University*, "Plasmon-induced hot carrier generation, relaxation, and applications"
8:00 **Amnon Yariv**, *TBA*, "TBA"
8:30 **Ernst Rasel**, *TBA*, "TBA"

	Active Nanophotonics Peter Nordlander, Chair	*Applied Laser Physics* Peter Reithmaier, Chair	*Atom Optics and Interferometry I* Ernst Rasel, Chair	*Epsilon-Zero Optics* Howard Lee, Chair
9:10	**Arseniy Kuznetsov**, *Institute of Materials Research and Engineering in Singapore*, "Active and tunable dielectric metaoptics"	**Johann Peter Reithmaier**, *University of Kassel*, "Ultra-Narrow Linewidth of Quantum Dot DIstributed Feedback Lasers"	**Arnaud Landragin**, *Universite PSL and Sorbonne Universite*, "Accurate rotation rate measurements witha cold atom Interferometer"	**Eric Mazur**, *Harvard University*, "Extreme optics with zero index metamaterials"
9:30	**Koray Aydin**, *Northwestern University*, "Emerging Anisotropic 2D Layered Materials for Photonics, Plasmonics and Polaritonics"	**Gadi Eisenstein**, *Russel Berrie Nanotechnology Institute*, "Resonant and non-resonant tunneling injection in quantum dot gain media"	**Grant Biedermann**, *University of Oklahoma*, "Growing complexity in quantum metrology with neutral atom spins"	**Andrea Di Falco**, *University of St. Andrews*, "Conformable and nonlinear epsilon near zero metamaterials"
9:50	**Jason Valentine**, *Vanderbilt University*, "Compound Metaoptics For Image Processing"	**John Bowers**, *University of California Santa Barbara*, "Narrow Linewidth Widely Tunable Semiconductor Lasers on Si"	**Lucia Hackermuller**, *TBA*, "TBA"	**Yuanmu Yang**, *Tsinghua University*, "Nonlinear Up- and Down-Conversion Using Epsilon-near-zero Materials"
10:10	**Alejandro Manjavacas**, *University of New Mexico*, "Analysis of the near and far field produced by plasmonic arrays"	**Kent Choquette**, *University of Illinois*, "Control of Complex Coupling in Microcavity Laser Arrays"	**Jeffrey Lee**, *Naval Postgraduate School*, "Progress toward a magnetically sensitive atom interferometer"	**Howard Lee**, *Baylor University and Texas A&M University*, "Epsilon-near-zero Optics in Planar and Optical Fiber Platform"

10:30 — Break —

Plenary Session Mark Saffman, Chair

10:50 **Peter Zoller**, *University of Innsbruck and Austrian Academy of Sciences*, "Cross–Platform Verification of Intermediate Scale Quantum Devices"
11:20 **Warwick Bowen**, *Univesity of Queensland*, "Superfluid thin-film optomechanics: Coherent vortex dynamics, cooling and Brillouin lasing"

	Programmable Quantum Simulators and Quantum Sensors Peter Zoller, Chair	*Strongly-Interacting Superfluids* Warwick Bowen, Chair	*Quantum Optics with X-rays II* Jörg Evers, Chair	*Quantum and Spin Photonics* Zubin Jacob, Chair
12:00	**Adam Kaufman**, *JILA*, "Atom arrays of ultracold strontium: new tools for many-body physics and metrology"	**Jack Harris**, *Yale University*, "Single-phonon quantum optomechanics experiments in a superfluid-filled cavity"	**David Reis**, *Stanford PULSE Institute*, "Nonequlibrium lattice dynamics measurements"	**Andrew Weiner**, *Purdue University*, "Frequency Bin Photonic Entanglement: Characterization and Control"
12:20	**Hannes Pichler**, *Caltech*, "Quantum Algorithms with Rydberg atom arrays"	**John Davis**, *University of Alberta*, "Can a superfluid break translational symmetry?"	**Christian Ott**, *Max-Planck-Institut für Kernphysik*, "Strongly driving resonant transitions with intense XUV pulses"	**Zubin Jacob**, *Purdue University*, "Spin-1 Maxwellian Phases of Matter"
12:40	**Mark Saffman**, *University of Wisconsin–Madison*, "Quantum computing in 2D atomic arrays"	**David Schuster**, *TBA*, "TBA"	**Davide Bleiner**, *Swiss Federal Laboratories for Materials & Technology and University of Zurich*, "Table-top two-color soft X-ray laser by means of Ni-like plasmas"	**Hong Tang**, *Yale University*, "Integrated photon sources and detectors on $\chi(2)$ waveguide platform"

Tuesday Evening January 7 2020

Plenary Session Ron Folman, Chair

19:00 **Ralf Röhlsberger**, *BESY*, "When X-rays go Quantum: From Cavity QED to Quantum Imaging"
19:30 **Nikolay Zheludev**, *University of Southampton and Nanyang Technological University*, "Optical super-resolution beyond $\lambda/100$ through artificial intelligence"
20:00 **Dana Anderson**, *ColdQuanta, Inc. and University of Colorado*, "Coherent Matterwave Emission from an Atomtronic Transistor Oscillator"

	X-ray and Nuclear Quantum Optics Ralf Röhlsberger, Chair	*Artificial Intelligence and Nanophotonics* Nikolay Zheludev, Chair	*Atomtronics* Dana Anderson/Barry Garraway, Chair	*Quantum Photonics* Peter Nordlander, Chair
20:50	**Jörg Evers**, *Max Planck Institute for Nuclear Physics*, "Towards fast adaptive resonant X-ray optics"	**Alexandra Boltasseva**, *Purdue University*, "Advancing Photonic Device Design with Machine Learning"	**Mark Edwards**, *Georgia Southern University*, "Mechanism for smooth flow production in atom circuits by stirring"	**Jennifer Dionne**, *TBA*, "TBA"
21:10	**Lars Bocklage**, *DESY*, "X-ray quantum phase control with transient magnons"	**Daniel Brunner**, *CNRS and FEMTO-ST*, "Towards scalable Photonic Neural Networks"	**Malcolm Boshier**, *Los Alamos National Laboratory*, "Atomtronic Rotation Sensors"	**Tigran Shahbazyan**, *Jackson State University*, "Transition to strong coupling regime for quantum emitters coupled to a plasmonic resonator"
21:30	**Christina Bömer**, *European X-ray Free Electron Laser*, "Systematic Investigation of X-rays Quantum Frequency Conversion into Visible and Ultraviolet Photons"	**Claudio Conti**, *National Research Council and University Sapeinza*, "Wave complexity and computation"	**Ron Folman**, *Ben-Gurion University of the Negev*, "A T^3 Stern-Gerlach matterwave interferometer on the atom chip"	**Stephen Gray**, *Argonne National Laboratory*, "Energy Propagation in Strongly Coupled Quantum Dot/Lattice Plasmon Systems"
21:50	**Joachim von Zanthier**, *University of Erlangen*, "Quantum imaging with incoherently scattered light from Free-Electron Lasers"	**Junsuk Rho**, *Pohang University of Science and Technology*, "Nanophotonics and deep-learning"	**Barry Garraway**, *University of Sussex*, "Dressing ultra-cold atoms for circuits, shells and lattices"	**Javier Aizpurua**, *San Sebastian (CSIC-UPV/EHU) and DIPC*, "Subfemtosecond Electron Transport in a Nanoscale Gap"
22:10	**Bernhard Adams**, *Quantum Optics Applied Research*, "Hanbury Brown–Twiss Astronomy with Ultrafast Imaging Photon Detectors to Measure the Hubble Constant"	**Nader Engheta**, *Univeristy of Pennsylvania*, "Photonic Mathemtatics with Metastructures and Mach-Zehnder Interferometers (MZIs)"	**John Howell**, *Hebrew University of Jerusalem*, "Towards a White Hole: An Optics Approach to Radiative Cooling"	**Henry Everitt**, *U.S. Army Combat Capabilities Development Command Aviation and Missile Center and Duke University*, "Widely tunable compact terahertz gas lasers"

Wednesday Morning January 8 2020

7:00 **Continental breakfast**

Plenary Session George Welch, Chair

7:30 **William Unruh**, *University of BC and Texas A&M University*, "Time Gravity and Quantum Mechanics"

8:00 **Alexei Sokolov**, *Texas A&M University*, "Applications of molecular coherence — from stand-off detection to nano-sensing — from ultrafast physics to biophotonics"

8:30 **Yoshihisa Yamamoto**, *NTT Research*, "Quantum Neural Network — connecting Quantum and Brain with Optics"

	Molecular Coherence Phenomena	*2-D Materials*	*Architectures and Materials for Photonic Networks*	*Atom Optics and Interferometry II*
	Deniz Yavuz, Chair	Alexandra Boltasseva, Chair	Yoshi Yamamoto, Chair	Frank Narducci, Chair
9:10	**Masayuki Katsuragawa**, *University of Electro-Communications*, "Designing nonlinear optical processes: Attractive rout to high resolution laser spectroscopy in the vacuum ultraviolet region"	**Susanne Yelin**, *University of Connecticut and Harvard*, "Quantum-level applications of 2D dipole arrays"	**Helmut Katzgraber**, *Microsoft*, "Quantum-driven classical optimization"	**Frank Narducci**, *Naval Postgraduate School*, "Asymmetry and coherence in continuous-beam atom interferometers"
9:30	**Benjamin Strycker**, *BRIC and Texas A&M University*, "Stimulated Raman Backscattering Amplification in Plasmas and Gases"	**Alexey Belyanin**, *Texas A&M University*, "Optical Hall effect and extreme anisotropy of surface polaritons in Weyl semimetals"	**Ryan Hamerly**, *MIT*, "Towards Large-Scale Photonic Accelerators for Deep Learning"	**Mark Havey**, *Old Dominion University*, "Raman Scattering and Atom Counting in Cold Rudibium Gas"
9:50	**Fetah Benabid**, *Université de Limoges*, "In-fiber gas-phase nanostructuring and dispersion control for non-classical light sources"	**Dimitri Voronine**, *University of South Florida*, "Quantum Biosensing with 2D Materials"	**Marty Fejer**, *Stanford University*, "Ultrabroadband Nonlinear Optics in Nanophotonic Periodically Poled Lithium Niobate Waveguides"	**Zhifan Zhou**, *Ben-Gurion University of the Negev*, "An experimental test of the geodesic rule proposition for the non-cyclic geometric phase"
10:10	**Volker Deckert**, *Leibniz Institute of Photonic Technology*, "Plasmon Enhanced Probe Spectroscopies Structural Investigation of Nanoscale Objects"	**Jha Pankaj**, *California Institute of Technology*, "Building a Quantum Hardware with Color Centers in Atomically Thin Crystals"	**Matthew Pelton**, *University of Maryland*, "Coupled Quantum-Dot/Plasmonic Nanoparticle Assembles for Low-Power Optical Nonlinearities"	**Michael Manicchia**, *Naval Postgraduate School*, "Dual continuous cold atom beam accelerometer/gyroscope"

10:30 — Break —

Plenary Session Virgil Sanders, Chair

10:50 **Marlan Scully**, *TAMU, Baylor, Princeton*, "Presentation of the 2020 Willis E. Lamb Award for Laser Science and Quantum Optics"

11:20 **Mikhail Lukin**, *Harvard University*, "New frontier of quantum science and engineering"

	Quantum Physics	*Quantum Optics with X-rays III*	*Nonlinear optics and optical frequency combs in microresonators*	*Novel Optics*
	Mikhail Lukin, Chair	David Reis, Chair	Tobias Kippenberg, Chair	Volker Dekert, Chair
12:00	**Luiz Davidovich**, *Federal University of Rio de Janeiro*, "Quantum Metrology of Open Systems: Exact solutions"	**Barry Walker**, *University of Delaware*, "Ultrafast K-shell Hole Creation from Strong and Ultrastrong Laser REscattering: optimized Wavelength and Intensity Yields for Lithium to Uranium"	**Tobias Kippenberg**, *EPFL*, "Photonic-chip based soliton microcombs"	**Jian Zi**, *Fudan University*, "Bound states in-the-continuum in periodic photonic systems: observations and polarization-state manipulations"
12:20	**János Bergou**, *Hunter College of the City University of New York*, "90 years after the Bohr-Einstein debate: Complementarity revisited"	**Wen-Te Liao**, *National Central University*, "Control and production of nuclear excitations, from free space to a cladding x-ray waveguide"	**Xinhao Li**, *Massachusetts Institute of Technology*, "Modeling Colloidal-Quantum-Dot Plasmonic Laser as Excitable Spike Neuron"	**Zhenrong Zhang**, *Baylor University*, "Nano-focusing of light with optical fiber-plasmonic hybrid probe"
12:40	**Giacomo Torlai**, *TBA*, "Enhancing quantum simulators with neural networks"	**Uwe Thumm**, *Kansas State University*, "Ro-vibrational dynamics and stabilization of laser-excited $O_2{}^+$"	**Takasumi Tanabe**, *Keio University*, "Generation of clustered comb with dispersion controlled high-Q crystalline whispering gallery mode microcavity fabricated with mechanical machining"	**Eugeniy Mikhailov**, *William & Mary University*, "Tuning laser frequency response from low to high with dispersion"

Wednesday Evening January 8 2020

Plenary Session Václav Špička, Chair

19:00 **Mercedeh Khajavikhan**, *TBA*, "TBA"
19:30 **Hui Cao**, *Yale University*, "Physics and Application of Complex Lasers"
20:00 **Jorge Rocca**, *Colorado State University*, "Relativistic nanophotonics: creating extreme plasma conditions and fields with ultrafast lasers"

	Physics of Semiconductor Nanolasers Mercedeh Khajavikhan, Chair	*Physics and Applications of Complex Lasers* Hui Cao, Chair	*Ultra-Intense Laser/Matter Int + X-ray Lasers* Jorge Rocca, Chair	*Harris Fest: Current Research by Steve's Former Students* Alexei Sokolov, Chair
20:50	**Markus Lindemann**, *Rhur-University Bochum*, "Ultrafast Spin-Lasers"	**Ortwin Hess**, *Imperial College London and Trinity College Dublin*, "Spatio-Temporal Near-Field and Multi-Mode Dynamics of Large-Area and Disordered Semiconductor Lasers"	**Matthias Fuchs**, *University of Nebraska–Lincoln*, "Enhanced performance and controllability of compact laser-driven high-brightness X-ray sources"	**Andy Kung**, *National Tsing Hua University*, "Single-cycle pulses — from molecular modulation to multi-plate pulse compression"
21:10	**Hui Deng**, *University of Michigan*, "Coherent Light-Matter Interactions in 2D Semiconductors"	**Marc Sciamanna**, *CentraleSupélec*, "Collective dynamics of semiconductor laser modes"	**Felicie Albert**, *TBA*, "TBA"	**Deniz Yavuz**, *University of Wisconsin*, "Toward Continuous-Wave Molecular Modulation Using Glass Microresonators"
21:30	**Alejandro Yacomotti**, *Université Paris*, "Towards few photon bifurcations in coupled nanolasers"	**Fan-Yi Lin**, *National Tsing Hua University*, "Generations of chaos-modulated pulses for 3D pulsed chaos lidars"	**Carmen Menoni**, *Colorado State University*, "Optical interference coatings for high performance peta-watt class lasers"	**Danielle Braje**, *MIT Lincoln Laboratory*, "Solid State Magnetometers Designed for Deployability"
21:50	**Stephan Reitzenstein**, *Technische Universität Berlin*, "Micropillar Lasers with Site-controlled Quantum Dots as Active Medium"	**Delphine Wolfersberger**, *CentraleSupélec*, "Emerging applications from photorefractive nonlinear photonics"	**Cameron Geddes**, *Lawrence Berkeley National Laboratory*, "Compact ultrafast accelerators and photon sources using laser-plasma acceleration"	**Shengwang Du**, *Hong Kong University of Science and Technology*, "Narrowband Biphotons: Generation, Manipulation, and Applications"
22:10	**Weng Chow**, *Sandia National Laboratories*, "Mode locking in a single-section semiconductor laser: theory and experiment"	**Simon Mahler**, *Weizmann Institute of Science*, "Solving combinatorial problems with coupled lasers"	**Bedros Afeyan**, *Polymath Research Inc.*, "Challenges in the Nonlinear Optics of High Energy Density Plasmas: Memory and Self-Organization, Control, Inverse Problems and Machine Learning"	**Sharon Shwartz**, *Bar Ilan University*, "Observation of strong nonlinear interactions in parametric downconversion of X-rays into ultraviolet radiation"

Thursday Morning January 9 2020

7:00 **Continental breakfast**

Plenary Session Frank Narducci, Chair

7:30 **Gershon Kurizki**, *Weizmann Institute of Science*, "Machines Powered by Heat and Information: Is Quantumness an Advantage?"
8:00 **Federico Capasso**, *Harvard University*, "Multifunctional Flat Optics: High Performance Components to Cameras"
8:30 **Wolfgang Schleich**, *Universität Ulm*, "Hawking radiation and the logarithmic phase singularity"

	Quantum Thermodynamic Machines	*MetaQuantum*	*Atom Optics and Interferometry III*	*Rydberg Physics with Applications to Quantum Information Science*
	Gershon Kurizki, Chair	Federico Capasso, Chair	Wolfgang Schleich, Chair	Svetlana Malinovskaya, Chair
9:10	**Özgür Müstecaplioğlu**, *Koç University*, "Quantum Fules for Quantum Machines"	**Mark Brongersma**, *TBA*, "TBA"	**Robert Thompson**, *TBA*, "TBA"	**Svetlana Malinovskaya**, *Stevens Institute of Technology*, "Chirped pulse entanglement of Rydberg atoms"
9:30	**Nir Bar-Gill**, *Hebrew University*, "Enhanced polarization transfer and many-body dynamics in spin ensembles in diamond"	**Xingjie Ni**, *Pennsylvania State University*, "Nonreciprocal Light Propagation with a Time-Varying Metasurface"	**Naceur Gaaloul**, *Leibniz University of Hanover*, "Atom optics experiments in space with the Cold Atom Laboratory facility"	**Alexey Gorshkov**, *NIST/University of Maryland*, "Nondestructive cooling of an atomic quantum register via state-insensitive Rydberg Interactions"
9:50	**Fred Jendrzejewski**, *Universität Heidelberg*, "Quantized refrigerator for an atomic cloud"	**Marko Lončar**, *Harvard University*, "Photonic and Phononic Interfaces for Diamond Spin Qubits"	**Jason Williams**, *California Institute of Technology*, "Maturing Space-Based Precision Metrology with Atom Interferometer Studies Aboard the ISS"	**Irina Novikova**, *William & Mary University*, "Optical Quantum States Control via Four-wave Mixing in Rb vapor"
10:10	**Eilon Poem**, *Weizmann Insitute of Science*, "Experimental demonstration of quantum effects in the operation of microscopic heat engines"	**Andrea Alu**, *TBA*, "TBA"	**Matthias Meister**, *Ulm University*, "The Space Atom Laser: An isotropic source for ultracold atoms aboard the International Space Station"	**Robin Côté**, *University of Massachusetts Boston*, "Rydberg electrons as a sensitive proble"

10:30 — Break —

Plenary Session Luiz Davidovich, Chair

10:50 **Mark Raizen**, *University of Texas*, "Zooming in on Brownian Motion with Einstein's Speed Demon"
11:20 **Chao-Yang Lu**, *University of Science and Technology of China*, "Scalable photonic quantum technologies"

	Measurement of Physical Forces on the Nanoscale	*Photonic Quantum Computing*	*Open Systems*	*Optical Resonators: Physics and Applications*
	Mark Raizen, Chair	Chao-Yang Lu, Chair	Yuri Rostovtsev, Chair	Lan Yang, Chair
12:00	**Paulo Maia Neto**, *Universidade Federal do Rio de Janeiro*, "Probing the screening of the Casimir interaction with optical tweezers"	**Richard Warburton**, *TBA*, "TBA"	**Václav Špička**, *Academy of Sciences of the Czech Republic*, "Dynamics of open systems and quantum transport theory"	**Frank Vollmer**, *University of Exeter*, "Single-Molecule Sensing: Light waves meet molecular machines"
12:20	**Giorgio Gratta**, *Stanford University*, "Measuring gravity at short distances and other fun tricks with levitated microspheres"	**Glenn Solomon**, *TBA*, "TBA"	**Peter Keefe**, *University of Detroit Mercy*, "Thermodynamics of Mesoscopic Superconductors"	**Tal Carmon**, *TBA*, "TBA"
12:40	**Jeremy Munday**, *University of California*, "Casimir forces and torques"	**Li-Ping Yang**, *Purdue University*, "Single-Photon Detection Using Quantum Phase Transitions"	**Roland Allen**, *Texas A&M University*, "An ideal dark matter scenario and the experimental evidence supporting it"	**Lan Yang**, *Washington University*, "Explore Chiral Modes at Exceptional Points in Whispering-Gallery-Mode Resonators"

17:30 **Poster Session and Buffet Dinner — Ballrooms 2 & 3**

Thursday Evening January 9 2020

Plenary Session Vanderlei Bagnato, Chair

19:00 **Mete Atature**, *TBA*, "TBA"
19:30 **Ren-Bao Liu**, *The Chinese University of Hong-Kong*, "Quantum Sensing, sensing quantum"
20:00 **Ron Folman**, *Ben-Gurion University of the Negev*, "TBA"

	Semiconductor Quantum Optics Mete Atature, Chair	*Diamond Quantum Sensing* Ren-Bao Liu, Chair	*Quantum Informatics* Ron Folman, Chair	*Atom Optics and Interferometry IV* Wolfgang Schleich, Chair
20:50	**Janik Wolters**, *German Aerospace Center*, "Vapor Cell memories for single photons"	**Quan Li**, *THe Chinese University of Hong Kong*, "Measuring soft matters using nanodiamond based orientation sensing"	**Peter Drummond**, *Swinburne University of Technology*, "Dynamics of cat-states and quantum tunneling in quantum circuits"	**Lisa Wörner**, *University of Bremen*, "Quantum Gases Aboard the ISS-the BECCAL Project"
21:10	**Florian Katsch**, *Technische Universität Berlin*, "Theory of ultrafast excitonic dynamics in TMDCs: Exciton scattering induced dephasing and pump-probe spectroscopy"	**Peter Maurer**, *THe University of Chicago*, "Diamond quantum nanosensors for probing complex biological processes"	**Vanderlei Bagnato**, *University of São Paulo*, "Turbulent BEC: Demonstration of Nonthermal States and Universal Scaling Properties"	**Denys Bondar**, *Tulane University*, "When is it easier for a quantum particle to unnel through than to fly above a barrier?"
21:30	**Marcelo Davanco**, *NIST*, "Heterogeneous integrated silicon photonic circuits with deterministically fabricated single quantum dot single-photon sources"	**Jean-Francois Roch**, *TBA*, "TBA"	**Vladimir Malinovsky**, *US Army Research Laboratory*, "Universal pulse shapes of beam splitter and mirror for arbitrary large area atom interferometer"	**Gary Rozenman**, *Tel-Aviv University*, "Black Hole Physics, Kennard Phase and Surface Gravity Water Waves"
21:50	**Frank Jahnke**, *University of Bremen*, "Quantum-dot-like states and excited-carrier effects in atomically thin transition metal dichalcogenide semiconductors"	**Philip Hemmer**, *Texas A&M University*, "Color-center engineering in diamond"	**Alexey Akimov**, *Texas A&M University*, "Toward quantum simulation with Thulium atom"	**Paulo Nussenzveig**, *Universidade de São Paulo*, "Challenging conventional wisdom with Optical Parametric Oscillators"
22:10	**Yue Luo**, *Harvard University*, "Plasmonic cavity enhanced single photon emission from low-dimensional materials"	**David Simpson**, *University of Melbourne*, "Bio-Sensing and imaging with diamond quantum probes"	**Barnabas Kim**, *Texas A&M University*, "Correlation inside Canonical Ensemble through the investigation on Ideal Bose Gas"	**Philippe Bouyer**, *CNRS–IOGS*, "Atom interferometry for advanced geodesy an gravitational wave observation"

Friday Morning January 10 2020

7:00 **Continental breakfast**

Plenary Session Peter Keefe, Chair

7:30 **Paul Corkum**, *University of Ottawa*, "Combining vector beams and coherent control to generate large THz magnetic field transients"
8:00 **Leonid Butov**, *University of California at San Diego*, "Condensation of indirect excitons"
8:30 **Franco Nori**, *RIKEN and University of Michigan*, "Quantum Nonlinear Optics without Photons, how to excite two or more atoms simultaneously with a single photon, and other unusual properties of ultra-strongly-coupled QED systems."

	Controlling Light to Control Materials Paul Corkum, Chair	*Exciton Condensation* Leonid Butov, Chair	*Quantum Superpositions* Franco Nori, Chair	*Photon Physics* Vladimir Malinovsky, Chair
9:10	**Peter Hommelhoff**, *Universität Erlangen*, "Ultrafast physics in graphene and across graphene-SiC interface"	**Peter Abbamonte**, *University of Illinois at Urbana-Champaign*, "Suppression of the exciton Bose condensate in $TiSe_2Cu_x$ by electron doping"	**Margaret Reid**, *Swinburne University of Technology*, "Macroscopic realism, time and the Q-function model of reality"	**Andrei Afanasev**, *George Washington University*, "Angular Momentum and Polarization Transfer from Twisted Light to Atoms"
9:30	**Shima Mirzaeimoghader**, *University of Central Florida*, "Symmetry and High Harmonic Generation from Crystalline Solids"	**Jie Shan**, *Cornell University*, "Interlayer exciton condensation in atomic double layers"	**John Reintjes**, *KeyW Corp*, "Temporal Resolution in Photon Correlations"	**Hichem Eleuch**, *Abu dhabi University*, "Harmonic-Like Potentials: New Classes of Potentials with Exact Energies and Eigenfunctions"
9:50	**Guilio Vampa**, *SLAC National Accelerator Laboratory*, "Beating absorption in solid-state high harmonics"	**Luis Jauregui**, *University of California at Irvine*, "Interlayer Excitons and Magneto-Exciton Condensation in van der Waals Heterostructures"	**Byoung Ham**, *Gwangju Institute of Science and Technology*, "Understanding of quantum superposition for unconditional security in classical key distribution"	**Edward Fry**, *Texas A&M University*, "High Sensitivity Optical Absorption Studies"
10:10	**Ravi Bhardwaj**, *University of Ottawa*, "Spatially controlled nanostructuring of silicon with light"	**Philippe St-Jean**, *Université Paris-Saclay*, "Measuring topological invariants in polaritonic lattices"	**Sergey Polyakov**, *NIST*, "Energy efficient classical communication via a quantum-measurement-inspired protocol"	**Fu-li Li**, *Xi'an Jiaotong University*, "Efficient tomography of orbital angular momentum states of photons"

10:30 — Break —

Plenary Session Bob Boyd, Chair

10:50 **Girish Agarwal**, *Texas A&M University*, "Magnons: New Platform for Quantum Optics and Quantum Information Science"
11:20 **Harry Atwater**, *California Institute of Technology*, "Laser Lightsails"

	Macroscopic Magnon Systems Girish Agarwal, Chair	*Radiation Pressure Manipulation and Propulsion* Harry Atwater, Chair	*Novel Detection Systems* Fu-li Li, Chair	*Quantum Sensors for Fundamental Physics* Kater Murch, Chair
12:00	**Can-Ming Hu**, *University of Manitoba*, "Unidirectional Invisibility in Cavity Magnonics"	**Grover Swartzlander**, *Rochester Institute of Technology*, "Radiation Pressure and Beam Riding with a Space Variant Grating"	**Yuri Rostovtsev**, *University of North Texas*, "A novel resonant single frequency molecular detection with high sensitivity and selectivity for gas mixtures"	**Shimon Kolkowitz**, *University of Wisconsin – Madison*, "Searching for new physics with differential optical lattice clock comparisons"
12:20	**Yasunobu Nakamura**, *University of Tokyo and RIKEN Center for Emergent Matter Science*, "Quantum magnonics in a millimter-scale ferromagnetic sphere"	**Kevin Webb**, *Purdue University*, "Enhanced Optical Force with Nanostructured Material"	**Narangerel Altangerel**, *Texas A&M University*, "Applied Raman spectroscopy: Analyzing animal characteristics by their feces"	**Igor Pikovski**, *Stockholm University and Stevens Institute of Technology*, "Quantum optics in the presence of time dilation"
12:40	**Michael E. Tobar**, *University of Western Australia*, "Implementations of Cavity-Magnon Polariton Systems: from Ultra Strong Coupling to Applications in Precision Measurement and Fundamental Physics"	**Mikhail Kats**, *University of Wisconsin-Madison*, "Engineering of optical forces and thermoregulation of laser sails for light spacecraft"	**Zhedong Zhang**, *Texas A&M University*, "Quantum cooperativity in Living Matter"	**Andrew Jayich**, *UC Santa Barbara*, "Radium: a platform for precision measurement"

Friday Evening January 10 2020

Plenary Session Marlan Scully, Chair

19:00 **Vanderlei Bagnato**, *University of São Paulo*, “Microbiological control with photodynamic action: new hope against resistant bacterias”
19:30 **Vladislav Yakovlev**, "from Quantum Physics To Quantum Chemistry and Quantum Biology
20:00 **Shaul Mukamel**, *TBA*, “TBA”

	Quantum mechanics in curved and living platforms William Unruh, Chair	*Non-Classical Biophysics and Imaging* Vladislav Yakovlev, Chair	*Quantum Molecular Physics* Shaul Mukamel, Chair	*Coherent and Enhanced AMO* Anatoly Svidzinsky, Chair
20:50	**Jonathan Ben-Benjamin**, *Texas A&M University*, "The Unruh and Moore effects, and equivalence between accelerating frames"	**Leonid Krivitsky**, *Institute of Materials Research and Engineering*, “Infrared metrology with visible light”	**Christian Bressler**, *European XFEL*, “Femtosecond X-Ray Experiments at European XFEL”	**Zhenhuan Yi**, *Texas A&M University*, “Enhancing Coherent Anti-Stokes scattering with IR”
21:10	**Arash Azizi**, *Texas A&M University*, “TBA”	**Konstantin Dorfman**, *East China Normal University*, “Four-wave mixing spectroscopy with squeezed light”	**Wei Xiong**, *UC San Diego*, “Ultrafast Nonlinear Dynamics and Coupling between Molecular Polaritons in Different Cavities”	**Yogesh Patil**, *TBA*, “Measuring the Topological Structure Around a Triple Exceptional Point”
21:30	**Tuguldur Begzjav**, *Texas A&M University*, “TBA”	**Joel Bixler**, *TBA*, “TBA”	**Pavel Polynkin**, *The University of Arizona*, “Spectral interference in short-wave and mid-wave infrared laser filaments in gases”	**Zhe He**, *Texas A&M University*, “Tip enhanced chemical mapping of DNA/RNA at single-molecule resolution”
21:50	**TBA**, *TBA*, “TBA”	**Wolfgang Losert**, *TBA*, “TBA”	**Luca Argenti**, *University of Florida*, “Circular Holographic Ionization-Phase Meter”	**Mariia Shutova**, *Texas A&M University*, “Nanoantennas for chiral single-molecule spectroscopy”
22:10	**TBA**, *TBA*, “TBA”	**Dmitry Kurouski**, *Texas A&M University*, “Observation of Hot-Carrier Driven Chemical Reaction by TERS”	**Arvinder Sandhu**, *University of Arizona*, “Probing electronic couplings with XUV transient spectroscopy”	**Kai Wang**, *Texas A&M University*, “Studies of Atomic Hydrogen Superfluorescence in Flames Using Femtosecond Pump-Probe Spectroscopy”