

Institute for Quantum Science and Engineering Workshop

(Organized by M. O. Scully)

TAMU, College Station, Texas, January 13-14, 2015

Tuesday 01/13/2015

Session (Location)	I. (IQSE 5th Floor) Chair: Anatoly Svidzinsky
7:30 a.m. - 8:00 a.m.	Breakfast
8:00 a.m. - 8:05 a.m.	<i>Marlan Scully, Welcome</i>
8:05 a.m. - 8:10 a.m.	<i>Dean H. Joseph Newton, Opening Remarks</i>
8:10 a.m. - 8:50 a.m.	Norbert Kroo, Hung. Acad. Sci. "Some experimental evidences for SPO assisted room temperature superconductivity"
8:50 a.m. - 9:10 a.m.	Aleksei Zheltikov, TAMU "Ultrafast nonlinear optics in the mid-infrared"
9:10 a.m. - 9:30 a.m.	Alexei Sokolov, TAMU "Applications of Molecular Coherence"
9:30 a.m. - 9:50 a.m.	Da-Wei Wang, TAMU "Single-photon Superradiance: Yesterday, Today, and Tomorrow"
9:50 a.m. - 10:10 a.m.	Anatoly Svidzinsky, TAMU "QASER: from radio frequencies to optical domain"
10:10 a.m. - 10:30 a.m.	Olga Kocharovskaya, TAMU "Coherent control of the gamma-photon waveforms: gamma-photon time-bin qudits"
10:30 a.m. -10:50 a.m.	BREAK/Poster Session
10:50 a.m. - 11:10 a.m.	David Lee, TAMU "Dynamic Nuclear Polarization of H and D Atoms Embedded in Crystals of Hydrogen Isotopes"
11:10 a.m. - 11:30 a.m.	Yuri Rostovtsev, UNT/TAMU "Temporal and Spatial Coherence and its Applications"
11:30 a.m. - 11:50 a.m.	Gershon Kurizki, Weizmann Institute of Science "Quantum Heat Machines: How Does Quantumness Help?"
11:50 a.m. - 12:10 p.m.	Wolfgang Niedenzu, Weizmann Institute of Science "Power enhancement of heat engines via correlated thermalisation in multilevel systems"
Lunch 12:10 p.m. - 12:50 p.m.	IQSE 5th Floor (Catered by Jason's Deli)
Session (Location)	II. (IQSE 5th Floor) Chair: Phil Hemmer
12:50 p.m. - 1:30 p.m.	Yuri Shvyd'ko, Argonne National Laboratory "X-Ray Free-Electron Laser Oscillators: Feasibility Studies"
1:30 p.m. - 2:10 p.m.	Bernhard Adams, Argonne National Laboratory "Coherence Conversion for fs X-ray Spectroscopy with ns X-rays and a Slow Detector"
2:10 p.m. - 2:30 p.m.	Imran Mirza, University of Oregon, TBA
2:30 p.m. - 2:50 p.m.	Alexander Cerjan, Yale "General theory of the quantum limited laser linewidth"
2:50 p.m. - 3:10 p.m.	Hans Schuessler, TAMU "The HFS of the halo nucleus $^{11}\text{Be}^+$ by laser-microwave spectroscopy of stored ions"
3:10 p.m. - 3:30 p.m.	BREAK/Poster Session
3:30 p.m. - 4:10 p.m.	Naomi Halas, Rice University "Molecular Plasmonics"
4:10 p.m. - 4:50 p.m.	Peter Nordlander, Rice University "Plasmon-induced hot carrier science"

OTHER Planned Activities

January 13: 5:30 PM Reception and Dinner (in honor of Norbert Kroo), College Station Hilton, Ballroom 1
(801 University Drive East, College Station, Texas 77840, Phone: 979-693-7500)

Wednesday 01/14/2015

Session (Location)	III. (IQSE 5th Floor) Chair: Alexei Sokolov
7:30 a.m. - 8:00 a.m.	Breakfast
8:00 a.m. - 8:10 a.m.	<i>President Mark Hussey, Opening Remarks</i>
8:10 a.m. - 8:20 a.m.	<i>Regent Jim Schwertner, Opening Remarks</i>
8:20 a.m. - 9:00 a.m.	Sune Svanberg, Lund University "Laser spectroscopy applied to environmental and ecological research"
9:00 a.m. - 9:40 a.m.	Katarina Svanberg, Lund University Hospital, "Photonics to meet some medical challenges"
9:40 a.m. - 10:00 a.m.	Marlan Scully, TAMU "Quantum Biophotonics"
10:00 a.m. - 10:20 a.m.	Dmitri Voronine, TAMU "Towards tip-enhanced nanoscale bio-imaging"
10:20 a.m. - 10:50 a.m.	BREAK/Poster Session
10:50 a.m. - 11:10 a.m.	Raimund Ober, TAMU "Single molecule microscopy: Resolution, localization and 3D tracking in live cells"
11:10 a.m. - 11:30 a.m.	Duane Kraemer and Nara Altangerel, TAMU "Raman spectroscopic study of plant stress in vivo"
11:30 a.m. - 12:00 p.m.	Peter Rentzepis, TAMU "Bacteria: Inactivation in plasma and detection"
Lunch 12:00 p.m. - 12:40 p.m.	IQSE 5th Floor (Catered by Jason's Deli)
Session (Location)	IV. (IQSE 5th Floor) Chair: Vlad Yakovlev
12:40 p.m. - 1:20 p.m.	Gennady Shvets, UT-Austin "Emulating Quantum Mechanical Phenomena with Metamaterials: From Fano Resonances to Topological Insulators"
1:20 p.m. - 2:00 p.m.	Vincenzo Tamma, TAMU "Multi-Boson Correlation Interferometry with Thermal Sources"
2:00 p.m. - 2:20 p.m.	Phil Hemmer, TAMU "Bio-sensing and super-resolution with color centers in diamond"
2:20 p.m. - 2:40 p.m.	Jeremy Kunz, Baylor "Detection of plant stress using LIB spectroscopy"
2:40 p.m. - 3:00 p.m.	Robert Nevels, TAMU "A decomposition and interpretation of plasma and plasmonic waves"
3:00 p.m. - 3:20 p.m.	Hua Xia, TAMU/Princeton "Probing near the zero susceptibility wavelength in high density Rubidium vapor"
3:20 p.m. - 3:50 p.m.	BREAK/Poster Session
3:50 p.m. - 4:10 p.m.	Vitaly Kocharovskiy, TAMU "Fundamental equations for the BEC phase transition"
4:10 p.m. - 4:30 p.m.	Vladislav Yakovlev, TAMU "Seeing thing in a new light"
4:30 p.m. - 4:50 p.m.	Brett Hokr, TAMU "Random lasing via a Raman transition"

OTHER Planned Activities

**January 14: 5:30 PM Reception and Dinner (in honor of Jim Schwertner), College Station Hilton, Ballroom 1
(801 University Drive East, College Station, Texas 77840, Phone: 979-693-7500)**

	Presenter		Poster Title
1	Timur Akhmadzhanov	TAMU	Train of ultrashort pulses formation via switching of the resonant interaction between XUV radiation and atoms by tunnel ionization
2	Gombojav O. Ariunbold	TAMU	Raman Spectroscopic Study of Metastatic Porcine Skin Tumors
3	Jonathan Ben-Benjamin	City University of New York	Multi mode Wigner approximation
4	Blake Birmingham	Baylor University	Kinetics of Ag islands on Ag(111) studied via scanning tunneling microscopy
5	Han Cai	TAMU	Collective Lamb Shift induced Quantum Tunneling in High Order Nonlinearity
6	Cheng-Wei Huang	TAMU	Proposal of a new type of optical parametric amplifier for efficient X-ray generation
7	Barnabas Kim	TAMU	Thermodynamics in Bose Gas
8	Zeyang Liao	TAMU	Single photon modulation by the collective many-body effects
9	Zachary Liege	Baylor University	Investigation of SERS mechanisms using AFM/Raman imaging
10	Chuanhong Liu	TAMU	Resolving Spectral Congestion in Time-Resolved SECARS using Compressive Sensing
11	Xiaohan Liu	TAMU	Resonance Effects in Surface -Enhanced Coherent Raman Spectroscopy
12	Robert Nevels	TAMU	A decomposition and interpretation plasma and plasmonic waves
13	Robert Scully	TAMU	Agri-Bio-Photonics
14	Yujie Shen	TAMU	Single-beam coherent anti-Stokes scattering with spectral hole
15	Anton Shutov	TAMU	All-collinear FAST CARS on gases
16	Maria Shutova	TAMU	Synthesis of optical vortices in multi-order Raman sideband generation
17	Jonathan Thompson	TAMU	Fighting scattering with phase beam shaping
18	Philip A. Vetter	TAMU	Single photon superradiance revisited: Expanding the analysis of subradiat states
19	Dmitri Voronine	TAMU	Biological quantum heat engines
20	Luojia Wang	TAMU	Parametric generation of high frequency light in negative index material
21	Hui Xia	TAMU	Probing near the zero susceptibility wavelength in high density rubidium vapor
22	Zhenhuan Yi	TAMU	Towards cooperative resonance effects in rubidium vapor
23	Yiyu Zhou	TAMU	Quantum-Coherence-Controlled Nanolaser Dynamics