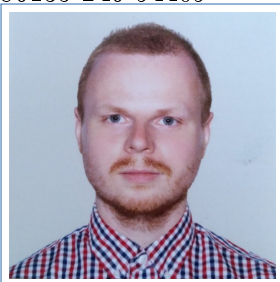


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Dr. Konstantin E. Dorfman

Curriculum Vitae

Personal profile

The background in fundamentals of many body theory and quantum/classical electronics during my education constitute a solid foundation to study the complex behavior of nonlinear systems. The combination of this knowledge with the experience in quantum optics and laser physics acquired during my postdoctoral work at Texas A&M University are key-stones to a successful scientific career in topics related to fundamental light-matter interactions, AMO physics. My postdoctoral position at University of California, Irvine on nonlinear optical spectroscopy reinforced my foundation in complex system dynamics at a microscopic level and broadened my areas of expertise to include complex biomolecular aggregates. During my postdoctoral studies I significantly contributed to this field of study by developing novel optical techniques for molecular dynamics studies that utilize quantum states of light, light range from THz to X-ray, pulse shaping and various quantum interference phenomena at a microscopic scale.

I have extensive teaching experience in both undergraduate and graduate levels with wide variety of responsibilities including lecture, laboratory and interactive learning environment. This experience taught me how to motivate my students to understand and love science and to pursue it using various teaching techniques. Being in charge of composing the qualifying exam for the AMO program allowed me to evaluate the academic strengths and weaknesses of the students and contribute to the development of the curriculum. Finally having extensive mentoring experience with diverse (multinational and multicultural) population of students provided the foundation for reinforcement of the classroom material and allowed students to obtain the practical research skills.

Education

- 2006-2009 **Ph.D. in Physics**, *Texas A&M University*, *GPA – 4.0.*
Specialized in Atomic, Molecular Physics and Optics
- 2002-2006 **B.S. in Physics**, *Nizhny Novgorod State University.*
Specialized in Relativistic Electronics and Terahertz Physics

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Ph.D. Thesis

- Title** Modern problems in statistical physics of Bose-Einstein Condensation and in electrodynamics of Free Electron Lasers
- Supervisor** Professor Vitaly V. Kocharovsky
- Description** This thesis explored theoretical problems in statistical physics and electrodynamics of Bose particles, namely, mesoscopic effects in statistics of Bose-Einstein condensate (BEC) of atoms and photon's waveguide effects of planar Bragg structures in Free Electron Lasers.

Research Experience

- 2017-Present **Professor**, STATE KEY LABORATORY OF PRECISION SPECTROSCOPY, EAST CHINA NORMAL UNIVERSITY, Shanghai, China.
- 2015-Present **Visiting Professor**, DEPARTMENT OF CHEMISTRY AND PHYSICS AND ASTRONOMY, UNIVERSITY OF CALIFORNIA, Irvine, CA.
- 2015–2017 **Scientist**, *Precision Measurement Group, Singapore Institute of Manufacturing Technology*, AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH A*STAR, Singapore.
Developing new theoretical and computational tools for Laser and Nonlinear Spectroscopy Instruments
- 2012–2015 **Senior Research Scientist/Post-Doctoral Scholar**, UNIVERSITY OF CALIFORNIA (WITH PROF. SHAUL MUKAMEL), Irvine, CA.
I am investigating fundamental aspects of light matter interactions and their applications to nonlinear multidimensional optical spectroscopy, quantum optics and information.
- 2010–2012 **Post-Doctoral Fellow**, TEXAS A&M UNIVERSITY (WITH PROF. MARLAN SCULLY), College Station, TX.
I discovered novel quantum interference effects in quantum light amplifiers, photovoltaic cells and nanoplasmonic devices.
- 2010–2012 **Visiting Post-Doctoral Scientist**, PRINCETON UNIVERSITY (WITH PROF. MARLAN SCULLY), Princeton, NJ.
I developed a new coherent four-wave-mixing process assisted by plasma modulation of the refractive index for remote atmospheric sensing.
- 2009–2010 **Post-Doctoral Research Associate**, PASSAT INC (WITH DR. ALEXANDER SPIRO), Baltimore, MD.
I investigated various aspects of light matter interaction in high energy regime with applications to ablation lithography and remote atmospheric sensing.
- 2006–2009 **Graduate Research Assistant**, TEXAS A&M (WITH PROF. VITALY KOCHAROVSKY), College Station, TX.
I developed an analytical framework for statistics and thermodynamics in interacting Bose Einstein Condensate in canonical ensemble.
- 2003–2006 **Undergraduate Research Assistant**, INSTITUTE OF APPLIED PHYSICS, RUSSIAN ACADEMY OF SCIENCE (WITH PROF. NAUM GINZBURG), Nizhny Novgorod, Russia.
I investigated various aspects of Bragg structures in classical and quantum amplifiers based on Free Electron Laser.

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Teaching Experience

- 2016 Fall and **Lecturer, A*STAR.**
Spring Special Physics and Engineering Colloquium Series Lectures in Quantum and Nonlinear Optics
Semester
- 2010 Fall **Substitute Lecturer, TEXAS A&M UNIVERSITY.**
Semester Graduate Course in “Quantum Mechanics 2” (Physics 624)
- 2010 Fall **Substitute Lecturer, TEXAS A&M UNIVERSITY.**
Semester Graduate Course in “Special topics in Quantum Optics and Laser Physics” (Physics 689)
- 2006-2007 **Teaching Assistant, TEXAS A&M UNIVERSITY.**
Undergraduate Courses in “College Physics” (Phys 201) and “Mechanics” (Phys 218)

Students Mentoring

- 2016 Mentoring one junior researcher and one undergraduate student in my group
- 2012-2015 Mentoring three graduate students in my postdoctoral work in the group of Prof. Shaul Mukamel
- Prasoon Saurabh. We are working on investigation of photon counting signals with entangled light.
 - Kochise Bennett. We are working on X-ray Raman scattering and X-ray diffraction.
 - Frank Schlawin. We are working on developing new types of spectroscopies with quantum fields.
- 2010-2012 I was mentoring three graduate students during my postdoctoral work in the group of Prof. Marlan Scully
- Luqi Yuan. We worked on plasma-assisted coherent backscattering for the remote sensing
 - Pankaj Jha. We worked on quantum interference effects in lasing without inversion and photovoltaics and on desorption of alkali vapors.
 - Eyob Sete. We worked on entanglement in quantum beat lasers.

Organizing the Qualifying Exam

- 2011 I was in charge of composing, organizing and grading the “AMO Undergraduate Qualifying Exam” required for all the students working at the Institute for Quantum Science and Engineering, Texas A&M University. The exam included sections on classical electrodynamics, optics, quantum mechanics, statistical mechanics and elementary mathematics.

Funding

Proposal preparation and future funding

- 2017-2022 PI on Project “Nonlinear Spectroscopy with quantum light”, Zijiang Endowed Young Scholar Fund CNY 1,500,000
- 2016-2018 PI on Project “Energy-selective X-ray damage of the DNA base for sterilization application”, SGD 311,480

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- 2016-2018 PI on Project “Improving the performance of the high harmonic generation by coherent control schemes”, SGD 383,900
- 2016-2018 Co-PI on Project “Ultrafast and Broadband Mid-OR Photonics”, SGD 615,000
- 2009-2015 During my career as a researcher I participated in preparation of over fifteen full-size research proposals that include my own results and novel ideas that were submitted and consequently funded of total exceeding USD 2,500,000 by various government agencies including: National Science Foundation, National Institutes of Health, Department of Energy, Office of Naval Research, DARPA.

Awards and Support

- 2018 Fédération Doeblin Visiting Professor, University of Côte d’Azur, France
- 2017 Zijiang Endowed Young Scholar, China
- 2012-2014 National Science Foundation
- 2012-2014 National Institutes of Health
- 2012-2014 Department of Energy
- 2010–2012 Robert A. Welch Post-doctoral Fellowship
- 2006–2009 National Science Foundation
- 2006–2009 Air Force
- 2003-2006 Dynasty Foundation undergraduate scholarship, Russia
- 2003-2006 National Foundation for basic research, Russia

Referee

- Scientific Reports
- New Journal of Physics
- Journal of the Optical Society of America B
- Optics Express
- Optics Letters
- Optics Communications
- Journal of Raman Spectroscopy
- Journal of Modern Optics
- Applied Optics
- Physica A
- Physics Letters A
- The Journal of Physical Chemistry Letters
- Physical Chemistry Chemical Physics
- Annals of Physics
- Entropy
- Central European Journal of Physics

Reviewer for Funding Agencies

- 2015 Expert evaluator, PRESTIGE Marie Curie COFUND, Research Executive Agency of the European Commission

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- 2014 Reviewer, Netherlands Organization for Scientific Research, Innovational Research Incentives Scheme Vidi 2014 N
- 2012 Member, NSF Panel for the Quantum, Molecular and High Performance Modeling and Simulation for Devices and Systems (QMHP)

Conference Organizer

- 2013 The 43rd Winter Colloquium on the Physics of Quantum Electronics (PQE), session "Quantum Mechanics and Thermodynamics"

Service to community

- Judge at The First Annual AGS Symposium, University of California, Irvine, 2014
- Judge at 33rd Annual Irvine Unified School District Science Fair, 2014
- Volunteer at Annual Physics Festival, Texas A&M University, 2006-2009, 2010-2011
- Volunteer at Annual Chemistry Open House, Texas A&M University, 2006-2009, 2010-2011

Areas of expertise

- Nonlinear optics
- Atomic, molecular physics
- Chemical physics
- Quantum optics
- Nonlinear spectroscopy
- Nanophotonics
- Many-body theory
- Semiconductor optics
- Open quantum systems

Languages

English **Fluent**
Russian **Mothertongue**

Interests

- Reading
- Soccer
- Outdoor activities
- Classical music, playing piano
- Hiking

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List of publications

H-index: 19, total number of citations: 1178

Articles in Referred Journals

56. K.E. Dorfman, R. Sawant, G. Briere, and P. Genevet, "Controlled-NOT quantum gate with dual phase gradient topological metasurfaces", submitted (2019).
55. S. Asban, K.E. Dorfman and S. Mukamel, "Quantum phase-sensitive diffraction and imaging using entangled photons", PNAS, **116**, 11673 (2019).
54. K.E. Dorfman, S. Asban, L. Ye, J.R. Rouxel, D. Cho and S. Mukamel, "Monitoring Spontaneous Charge-density Fluctuations by Single-molecule Diffraction of Quantum Light", J. Phys. Chem. Lett. **10**, 768 (2019).
53. K.E. Dorfman, P. Wei, J. Liu, and R. Li, "Quantum interference and collisional dynamics in excited bound states revealed by time-resolved pump-High-Harmonic-Generation-probe spectroscopy", Optics Express **27**, 7147 (2019).
52. F. Schlawin, K.E. Dorfman, and S. Mukamel, "Entangled Two-Photon Absorption Spectroscopy", Acc. Chem. Res. **51**, 2207 (2018).
51. P. Wei, M. Qin, K.E. Dorfman, X. Yuan, C. Liu, Z. Zeng, X. Ge, X. Zhu, Q. Liang, B. Yao, Q. Wang, H. Li, J. Liu, Y. Zhang, S.Y. Jeong, G.S. Yun, D.E. Kim, P. Lu, and R. Li, "Probing electron-atom collision dynamics in gas plasma by high-order harmonic spectroscopy", Optics Letters **43**, 1970 (2018).
50. K.E. Dorfman, D. Xu, J. Cao, "Efficiency at maximum power of a laser quantum heat engine enhanced by noise-induced coherence", Phys. Rev. E, **97**, 042120 (2018).
49. Z. Zhang, P. Saurabh, K.E. Dorfman, A. Debnath, and S. Mukamel, "Monitoring polariton dynamics in the LHClI photosynthetic antenna in a microcavity by two-photon coincidence counting", J. Chem. Phys. **117**, 074302 (2018).
48. K.E. Dorfman and S. Mukamel, "Multidimensional photon correlation spectroscopy of cavity polaritons", PNAS **115**, 1451 (2018).
47. M. Kowalewski, B.P. Fingerhut, K.E. Dorfman, K. Bennett, and S. Mukamel, "Simulating Coherent Multidimensional Spectroscopy of Nonadiabatic Molecular Processes: From the Infrared to the X-ray Regime", Chemical Reviews, **117**, 12165 (2017).
46. K.E. Dorfman, Yu Zhang, and S. Mukamel, "Coherent Control of Long-range Photoinduced Electron Transfer by Stimulated X-ray Raman Processes", PNAS, **113**, 10001 (2016).
45. K.E. Dorfman, F. Schlawin, and S. Mukamel, "Nonlinear optical signals and spectroscopy with quantum light", accepted to Review of Modern Physics, **88**, 045008 (2016).

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44. K.E. Dorfman, S. Mukamel, "Time-and-frequency gated photon coincidence counting: a novel multidimensional spectroscopy tool", arXiv:1602.03241, Phys. Scr. **91**, 083004 (2016). **The article has been selected for the cover of Phys. Scr.**
43. G. Fumero, G. Batignani, K.E. Dorfman, S. Mukamel, and T. Scopigno, "Probing ultrafast processes by fifth order Stimulated Raman Scattering", J. Phys.: Conf. Ser. **689**, 012023 (2016).
42. F. Schlawin, K.E. Dorfman, and S. Mukamel, "Pump-probe spectroscopy using quantum light with two-photon coincidence detection", Phys. Rev. A **93**, 023807 (2016).
41. G. Fumero, G. Batignani, K.E. Dorfman, S. Mukamel, and T. Scopigno, "On the Resolution Limit of Femtosecond Stimulated Raman Spectroscopy: Modelling Fifth-Order Signals with Overlapping Pulses", Chem. Phys. Chem. **16**, 3533 (2015).
40. M. Kowalewski, K. Bennett, K.E. Dorfman, and S. Mukamel, "Catching conical intersections in the act: Monitoring transient electronic coherences by attosecond stimulated X-ray Raman signals", arXiv:1510.02997v1 [physics.chem-ph], Phys. Rev. Lett. **115**, 193003 (2015).
39. K.E. Dorfman, K. Bennett, and S. Mukamel, "Detecting electronic coherence by multidimensional broadband stimulated X-ray Raman signals", arXiv:1506.08226 [physics.chem-ph], Phys. Rev. A **92**, 023826 (2015).
38. S. Mukamel, and K.E. Dorfman, "Nonlinear fluctuations and dissipation in matter revealed by quantum light", arXiv:1505.00894 [quant-ph], Phys. Rev. A **91**, 053844 (2015).
37. B.K. Agarwalla, K.E. Dorfman, and S. Mukamel, "Evaluation of optical probe signals from nonequilibrium systems", arXiv:1503.08252 [quant-ph], Phys. Rev. A **91**, 052501 (2015).
36. R. Glenn, K. Bennett, K.E. Dorfman, and S. Mukamel "Photon-Exchange Induces Optical Nonlinearities in Harmonic Systems", J. Phys. B: At. Mol. Opt. Phys. **48**, 065401 (2015).
35. B.K. Agarwalla, H. Ando, K.E. Dorfman, and S. Mukamel, "Stochastic Liouville equations for impulsive transient absorption and stimulated Raman spectroscopy", arXiv:1503.08387 [quant-ph], J. Chem. Phys. **142**, 024115 (2015).
34. Y. Zhang, J.D. Biggs, W. Hua, K.E. Dorfman, and S. Mukamel, "Three-Dimensional Attosecond Resonant Stimulated X-Ray Raman Spectroscopy of Electronic Excitations in Core-ionized Glycine", Phys. Chem. Chem. Phys. **16**, 24323 (2014).
33. H. Ando, B.P. Fingerhut, K.E. Dorfman, J.D. Biggs, and S. Mukamel "Femtosecond stimulated Raman spectroscopy of the cyclobutane thymine dimer repair mechanism: A computational study", J. Am. Chem. Soc. **136**, 14801 (2014).
32. K.E. Dorfman, F. Schlawin, and S. Mukamel "Stimulated Raman Spectroscopy with Entangled Light: Enhanced Resolution and Pathway Selection", arXiv:1407.3332 [quant-ph], The J. Phys. Chem. Lett. **5**, 2843 (2014).
31. K. Bennett, J. D. Biggs, Y. Zhang, K.E. Dorfman, and S. Mukamel "Time-, Frequency-, and Wavevector-Resolved X-Ray Diffraction from Single Molecules", arXiv:1405.4039 [physics.chem-ph], J. Chem. Phys. **140**, 204311 (2014).

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30. [K.E. Dorfman](#), and S. Mukamel "Multidimensional spectroscopy with entangled light; loop vs ladder delay scanning protocols", arXiv: 1402.0496 [quant-ph], New Journal of Physics **16**, 033013 (2014)
29. [K.E. Dorfman](#), and S. Mukamel "Indistinguishability and correlations of photons generated by quantum emitters undergoing spectral diffusion", Scientific Reports **4**, 3996 (2014).
28. B.P. Fingerhut, [K.E. Dorfman](#), and S. Mukamel "Probing the Conical Intersection Dynamics of the RNA Base Uracil by UV-Pump Stimulated-Raman-Probe Signals; Ab-Initio Simulations", J. Chem. Theory Comput. **10**, 1172 (2014).
27. [K.E. Dorfman](#), B.P. Fingerhut, and S. Mukamel "Time-resolved broadband Raman spectroscopies: A unified six-wave-mixing representation", arXiv: 1305.5291[quant-ph], J. Chem. Phys. **139**, 124113 (2013).
26. [K.E. Dorfman](#), P.K. Jha, D.V. Voronine, P. Genevet, F. Capasso, and M.O. Scully "Quantum-Coherence-Enhanced Surface Plasmon Amplification by Stimulated Emission of Radiation", arXiv:1212.5237v2 [quant-ph], Physical Review Letters **111**, 043601 (2013).
25. [K.E. Dorfman](#), B.P. Fingerhut, and S. Mukamel "Broadband infrared and Raman probes of excited-state vibrational molecular dynamics; Simulation protocols based on loop diagrams", arXiv: 1305.5291[quant-ph], Phys. Chem. Chem. Phys. **15**, 12348 (2013).
24. [K.E. Dorfman](#) and S. Mukamel "Collective resonances in $\chi^{(3)}$; a QED study", arXiv:1305.6994[quant-ph], Phys. Rev. A **87**, 063831 (2013).
23. B.P. Fingerhut, [K.E. Dorfman](#), and S. Mukamel "Monitoring Nonadiabatic Dynamics of the RNA Base Uracil by UV Pump-IR Probe Spectroscopy", The J. Phys. Chem. Lett. **4**, 1933 (2013).
22. [K.E. Dorfman](#), K. Bennet, Y. Zhang, and S. Mukamel "Nonlinear light scattering in molecules induced by impulsive X-ray Raman processes", arXiv:1303.3550v2 [quant-ph], Phys. Rev. A **87**, 053826 (2013).
21. F. Schlawin, [K.E. Dorfman](#), B. Fingerhut, and S. Mukamel "Suppression of population transport and control of exciton distributions in photosynthetic complexes by entangled photons", Nature Communications **4**, 1782 (2013).
20. [K.E. Dorfman](#), A.A. Svidzinsky and M.O. Scully "Increasing photovoltaic power by noise induced coherence between intermediate band states", Coherent Optical Phenomena **1**, pp. 42-49 (2013).
19. [K.E. Dorfman](#), D.V. Voronine, S. Mukamel, and M.O. Scully "Photosynthetic reaction center as a quantum heat engine", PNAS, **110**, 2746 (2013). **The article has been featured in PhysOrg News. See the commentary article by Peter Nalbach and Michael Thorwart.**
18. A.A. Svidzinsky, [K.E. Dorfman](#), and M.O. Scully, "Enhancing photocell power by Fano induced coherence", Coherent Optical Phenomena, **1**, pp. 7-24 (2012).
17. [K.E. Dorfman](#) and S. Mukamel "Nonlinear spectroscopy with time- and frequency-gated photon counting; A superoperator diagrammatic approach", Phys. Rev. A **86**, 013810 (2012).

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16. F. Schlawin, K.E. Dorfman, B. Fingerhut, and S. Mukamel “Manipulating two-photon fluorescence spectra of chromophore aggregates with entangled photons: A simulation study”, arXiv:1204.4490v1 [quant-ph]. Phys. Rev. A **86**, 023851 (2012).
15. K.E. Dorfman and S. Mukamel “Photon counting in parametric down-conversion: Interference of field-matter quantum pathways”, Phys. Rev. A **86**, 023805 (2012).
14. P.K. Jha, K.E. Dorfman, Z. Yi, L. Yuan, V. Sautenkov, Y.V. Rostovtsev, G.R. Welch, A.M. Zheltikov, and M.O. Scully, “Ultralow-power local laser control of the dimer density in alkali-metal vapors through photodesorption”, arXiv:1112.4115v1[physics.atom-ph], Applied Physics Letters, **101**, 091107 (2012).
13. L. Yuan, K.E. Dorfman, A.M. Zheltikov, and M.O. Scully, “Plasma Assisted Coherent Backscattering for Stand-off Spectroscopy”, Optics Letters **37**, pp. 987-989 (2012).
12. K.E. Dorfman, A.A. Svidzinsky, and M.O. Scully “Increasing Photocell Power by Quantum Coherence Induced by External Source”, Phys. Rev. A **84**, 053829 (2011).
11. A.A. Svidzinsky, K.E. Dorfman, and M.O. Scully, “Increasing photovoltaic power by Fano induced coherence”, Phys. Rev. A **84**, 053818 (2011).
10. E. Sete, K.E. Dorfman, and J.P. Dowling, “Phase-controlled entanglement in a quantum-beat laser: application to quantum lithography”, J. Phys. B: At. Mol. Opt. Phys. **44**, 225504 (2011). **The article has been selected for the cover of J. Phys. B.**
9. K.E. Dorfman, P.K. Jha, and S. Das, “Quantum-interference-controlled resonance profiles from lasing without inversion to photo-detection”, arXiv:1108.1567v1[physics.atom-ph], Phys. Rev. A **84**, 053803 (2011).
8. M.O. Scully, K. Chapin, K.E. Dorfman, M. Kim, and A.A. Svidzinsky, “Quantum Heat Engine Power Can be Increased by Noise Induced Coherence”, PNAS **108**, pp. 15097-15100, (2011). **The article has been featured in ScienceNews.**
7. L. Yuan, A.A. Lanin, P.K. Jha, A.J. Traverso, D.V. Voronine, K.E. Dorfman, A.B. Fedotov, G.R. Welch, A.V. Sokolov, A.M. Zheltikov, and M.O. Scully, “Coherent Raman Umklappscattering”, Laser Physics Letters, **8**, pp. 736-741, (2011).
6. K.E. Dorfman, M. Kim, and A.A. Svidzinsky, “Canonical statistics and thermodynamics of weakly interacting Bose gas: Recursion relation approach”, Phys. Rev. A **83**, 033609, (2011).
5. K.E. Dorfman, “Modern problems in statistical physics of Bose-Einstein Condensation and in electrodynamics of Free Electron Lasers”, Ph.D. thesis, Texas A&M University, USA, (2009).
4. V.V. Kocharovsky, VI.V. Kocharovsky, and K.E. Dorfman. “Origin and universal structure of non-Gaussian statistics of Bose-Einstein condensate in a mesoscopic perfect gas”, Radiophys. Quantum Electronics, vol. **52**, pp. 422-434, (2009).
3. K.E. Dorfman, N.S. Ginzburg, A.M. Malkin, and A.S. Sergeev. “FEL amplifiers based on planar Bragg waveguides”, PJTPH, No. 12, vol. **35**, pp. 9-17, (2009).
2. K.E. Dorfman, N.S. Ginzburg, A.M. Malkin, and A.S. Sergeev. “Open Planar Bragg Waveguides for Mode Selection in Quantum and Classical Amplifiers”, Laser Physics, No. 5, vol. **17**, pp. 665-671, (2007).

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1. V.R. Baryshev, K.E. Dorfman, N.S. Ginzburg, A.M. Malkin, N.Yu. Peskov, R.M. Rozental, A.S. Sergeev, and V.Yu. Zaslavsky. “The use of planar Bragg structures for generation and amplification of coherent radiation from spatially-extended active media”, *Izvestiya VUZ: Prikladnaya Nelineynaya Dinamika (Applied Nonlinear Dynamics)*, vol. **14**, pp. 43-70, (2006), ISSN 0869-6632.

Selected Conference Proceedings

4. F. Schlawin, K.E. Dorfman, B.F. Fingerhut, and S. Mukamel. “Nonlinear Spectroscopy of Chromophore Aggregates with Entangled Photon Pulses”, *Proc. of the XVIIIth International Conference on Ultrafast Phenomena In Ultrafast Phenomena XVI*, Editors, M. Chergui, S. Cundiff, E. Riedle and R. Schoenlein, (Springer-Verlag, Berlin), **41**, 12006 (2013).
3. K. Dorfman, K. Chapin, A. Svidzinsky, and M. Scully, “On Quantum Coherence Effects in Photo and Solar Cells”, arXiv: 1012.5321.v2[physics.atom-ph] (2010). Later revised version published as “Quantum Thermodynamics of Photo and Solar Cells”, *Second Law of Thermodynamics: Status and Challenges*, AIP Conf. Proc., pp. 256-264 (2011).
2. K.E. Dorfman, N.S. Ginzburg, A.M. Malkin, and R.M. Rozental. “Selective properties of a planar Bragg waveguide”, *Proc. of Joint 31st International Conference on Infrared Millimeter Waves and 14th International Conference on Terahertz Electronics*, p. 403, Shanghai, China, September 18-22 (2006).
1. K.E. Dorfman, N.S. Ginzburg, A.M. Malkin, and R.M. Rozental. “A FEL amplifier based on planar Bragg waveguides”, *Proc. of 28th International Free Electron Laser Conference (FEL 2006)*, pp. 393-396, Berlin, Germany, Aug 27 - Sep 1 (2006).





Plenary Presentations

2. “Quantum coherence in Quantum Heat Engines: Photovoltaics, Photosynthesis and Multidimensional Raman Spectroscopy” plenary talk presented at The 3rd Workshop on Coherent Energy Transport and Optimization in Photosynthesis, Nanyang Executive Center, NTU, Singapore, May 3, 2015
1. “Quantum Heat Engines: Past, Present and Future” plenary talk and “Pulse shaping control of the collective resonances in nonlinear transmission of broadband pulses” poster presented at the 43rd Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 6-11, 2013.

Invited Presentations





67. “Quantum optics in the time domain: ultrafast nonlinear spectroscopy and imaging with quantum light” talk presented at the Department of Physics Colloquium, University of North Texas, Denton, TX, USA, January 22, 2019.

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66. "Ultrafast diffraction imaging with quantum light" talk presented at the TAMU - PQE Follow-on Workshop, Institute for Quantum Science and Engineering, Texas A&M University, College Station, TX, USA, January 15, 2019.
65. "Ultrafast diffraction imaging with quantum light: phase-sensitive linear signals" talk presented at the 49th Winter Colloquium on the Physics of Quantum Electronics (PQE2019), Snowbird, Utah, USA, January 8, 2019.
64. "Ultrafast diffraction imaging with quantum light: enhanced resolution and spontaneous charge density fluctuations", talk presented at International Symposium on Nonlinear Optical Spectroscopy (ISNOS), Hefei, China, January 6, 2019.
63. "Quantum optics of complex systems: spectroscopic studies and imaging of molecules with quantum light" talk presented at International Conference on Quantum and Atomic Optics, ICQAO-18, IIT Patna, Patna, India, December 18, 2018.
62. "Quantum optics beyond qubits: molecular spectroscopy and imaging with quantum light. Part II" talk presented at Baylor Research and Innovation Collaborative (BRIC) Colloquium, Baylor University, Baylor, TX, November 29, 2018.
61. "Quantum optics beyond qubits: molecular spectroscopy and imaging with quantum light. Part I" talk presented at Institute for Quantum Science and Engineering Colloquium, Texas A&M University, College Station, TX, November 27, 2018.
60. "Ultrafast diffraction imaging with quantum light: enhanced resolution and spontaneous charge density fluctuations", talk presented at the Symposium on Ultrafast Laser and Electron Sources: Opening a New Window on the Primary Processes of Matter, Beijing, China, November 19, 2018.
59. "Quantum optics beyond qubits: molecular spectroscopy and imaging with quantum light" talk presented at the Department of Physics, Zhejiang University, Hangzhou, China, October 12, 2018.
58. "Quantum coherence in heat conversion: efficiency at maximum power, true steady state and strong coupling regime" talk presented at CSRC workshop on Quantum Coherence in Energy Transfer and Conversion, Beijing, China, September 20, 2018.
57. "Topological quantum optics with metasurfaces; subwavelength manipulation of light statistics", talk presented at CNRS-CRHEA, Sofia-Antipolis, France, September 7, 2018.
56. "Nonlinear spectroscopy with quantum light: Raman entanglement, and quantum squeezing in multi-wave mixing spectroscopy" talk presented at 8th International Multidisciplinary Conference on Optofluidics (IMCO 2018), Shanghai, China, August 6, 2018.
55. "Quantum interference and collisional dynamics in excited bound states revealed by time-resolved pump-High-Harmonic-Generation-probe spectroscopy" talk presented at The Fourth National Symposium on Ultrafast Spectroscopy (NSUS 2018), Shanghai, China, July 16, 2018.
54. "Quantum heat engines: quantum effects in system-environment interactions" talk presented at APCTP-KIAS Workshop on Motors and Engines, Seoul, South Korea, June 26, 2018.

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53. "Multidimensional spectroscopy in optical cavities based on photon correlations" talk presented at the APS March Meeting, Los Angeles, CA, USA, March 9, 2018.
52. "Ultrafast photon counting spectroscopy for studies of the cavity polariton dynamics" talk presented at the International Conference on Quantum and Nonlinear Optics, Kuala Lumpur, Malaysia, February 4, 2018.
51. "Studies of molecular polaritons in cavities by photon counting spectroscopy" talk presented at the International Workshop on Nonlinear Optical Spectroscopy and Dynamics of Complex Systems, University of Science and Technology, Hefei, China, December 9, 2017.
50. "Time-and-frequency gated photon counting spectroscopy of molecular polaritons in optical cavities" talk presented at the 12th National Optical Frontier Symposium, Chongqing, China, November 19, 2017.
49. "Quantum thermodynamics of small devices and ultrafast phenomena studied with quantum light sources" talk presented at the Center for Quantum Technologies, Beijing Institute of Technology, Beijing, China, November 6, 2017.
48. "Tracking the ultrafast dynamics of cavity polaritons by time-and-frequency gated photon correlations. Application to LHCII photosynthetic antenna", talk presented at the 3rd Symposium on the Frontier of AMO Physics in Shanghai, Shanghai University of Science and Technology, Shanghai, China, October 28, 2017.
47. "Quantum heat engines and quantum coherence effects in system-environment interactions", talk presented at the 3rd KIAS Workshop on Quantum Information and Thermodynamics, Korean Institute of Advanced Studies, Seoul, Korea September 19, 2017.
46. "Quantum effects at nanoscale in dynamics and thermodynamics of complex systems and their detection using nonclassical light and extreme wavelengths" talk presented at Department of Physics, Université CÔte d'Azur, Nice, France, July 20, 2017.
45. "Quantum-boosted light harvesting and generation devices. Theoretical analysis based on heat engine approach and characterization using multidimensional Raman Spectroscopy" talk presented at CNRS-CRHEA, Nice, France, July 17, 2017.
44. "Quantum Heat Engine Enhanced by Coherence: Efficiency at Maximum Power and Chambadal-Novikov-Curzon-Ahlborn Limit" talk presented at Frontiers of Quantum and Mesoscopic Thermodynamics (FQMT'17) , Prague, Czech Republic, July 14, 2017.
43. "Using nonclassical light, photon counting detection and extreme wavelengths techniques to investigate complex systems" talk presented at Max Born Institute for Nonlinear Optics, and Short Pulse Spectroscopy, Berlin, November 4, 2016.
42. "Nonlinear optical spectroscopy with nonclassical light, photon counting detection and extreme wavelength techniques" talk presented at Max Planck Institute for Structure and Dynamics of Matter, Hamburg, November 2, 2016.
41. "Quantum and nonlinear optical studies of complex systems, nonclassical light and extreme wavelengths" talk presented at the Department of Physics, East China Normal University, Shanghai, September 12, 2016.

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40. "Quantum Heat Engine Enhanced by Coherence: Is it possible to go beyond Chambadal-Novikov-Curzon-Ahlborn Limit" talk presented at Center for Quantum Technologies, National University of Singapore, August 29, 2016.
39. "Quantum Heat Engine Enhanced by Coherence: Revisiting Chambadal-Novikov Efficiency" talk presented at Symposium Limits to the Second Law of Thermodynamics held at 97th Annual Meeting of AAAS Pacific Division, San Diego, California, June 17, 2016.
38. "Controlling complex systems with quantum light and attosecond X-ray pulses" talk presented at School of Physical and Mathematical Sciences, Nanyang Technological University, February 1, 2016.
37. "Investigating advanced materials with quantum light and attosecond X-ray pulses" talk presented at the Department of Physics, University of Alabama, Birmingham, January 21, 2016.
36. "Characterizing quantum coherence enhanced Quantum Heat Engines by multidimensional Raman Spectroscopy" talk presented at the Quantum Thermodynamics: Coherence, Flux, and Heat Engine Efficiency Symposium, MIT, October 11, 2015.
35. "Steady state and dynamical coherence effects in Photovoltaic, Photosynthetic and Laser Quantum Heat Engines and their detection by Stimulated Raman Spectroscopy" talk presented at the Singapore University of Technology and Design, May 12, 2015.
34. "Multidimensional optical spectroscopy with quantum light", talk presented at the Chemistry/Physics Seminar, Nanyang Technological University, May 11, 2015.
33. "Multidimensional X-ray Raman spectroscopy: probing and controlling electron dynamics in complex systems", talk presented at the Singapore Institute of Manufacturing Technology, May 7, 2015.
32. "Ultrafast quantum photonics studies of complex systems", talk presented at the Department of Physics, National University of Singapore, May 5, 2015.
31. "Using Quantum Photonics To Investigate Complex Systems" talk presented at the Max Planck Society, Berlin, Germany, February 12, 2015.
30. "Using Quantum Photonics To Investigate Complex Systems" talk presented at the Max Planck Science of Light Institute, Erlangen, Germany, February 11, 2015.
29. "Using Quantum Photonics To Investigate Complex Systems" talk presented at the Department of Physics, University of Nevada, Reno, February 2, 2015.
28. "Using Quantum Photonics To Investigate Complex Systems" talk presented at the Department of Physics, Rochester Institute of Technology, June 20, 2014.
27. "Broadband infrared and Raman probes of excited-state vibrational dynamics in time and frequency domain measurements with classical and quantum light" talk presented at the Department of Chemistry, University of Rochester, June 19, 2014.
26. "Merging nonlinear spectroscopy with interferometry by manipulating single photons" talk presented at 2nd Princeton Workshop on Classical, Semi-classical and Quantum Noise, Princeton University NJ, March 21-23, 2014.

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25. "Quantum and nonlinear optics of the complex systems" talk presented at the Department of Physics and Engineering Physics, Tulane University, New Orleans LA, March 17, 2014.
24. "Loop vs ladder delay scanning protocols in multidimensional spectroscopy with entangled light" talk presented at APS March Meeting, Denver, CO, March 6, 2014.
23. "Detecting excited-state vibrational dynamics by broadband infrared or Raman probes; A unified picture based on loop diagrams" talk presented at APS March Meeting, Baltimore MD, March 22, 2013.
22. "Microscopic approach to parametric down conversion" talk given at TAMU/Princeton Workshop on Quantum Science and Engineering, Casper, WY, July 16-20, 2012.
21. "Noise induced quantum effects in photosynthetic complexes" talk given at APS March Meeting, Boston MA, March 1, 2012.
20. "Quantum mechanics of photosynthesis" talk given at Quantum Optics/AMO Physics Seminar, Texas A&M University, January 24, 2012.
19. "Photosynthetic reaction center quantum heat engine" talk given at TAMU Physics of Quantum Electronic Follow-on Workshop, Texas A&M University, January 11, 2012.
18. "Quantum effects in photosynthetic complexes under natural conditions" talk given at the 42nd Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 2-6, 2012.
17. "Theory of Single Photon Gain Swept Superradiance" talk given at Quantum Optics/AMO Physics Seminar, Texas A&M University, November 22, 2011.
16. "Noise induced coherence. Photovoltaics vs Photosynthesis. Theory and Experiment" talk given at Dudley Herschbach "Insight Club", Texas A&M University, October 6, 2011.
15. "Quantum Solar Cells" talk given at Princeton/TAMU Workshop, Princeton, NJ, September 1, 2011.
14. "Quantum Photovoltaics Enhanced by Noise Induced Coherence" talk given at TAMU/Princeton Workshop on Quantum Science and Engineering, Jackson, WY, July 24-29, 2011.
13. "Quantum Heat Engine Power Can be Increased by Noise Induced Coherence" talk given at Symposium The Second Law of Thermodynamics: Status and Challenges held at 92nd Annual Meeting of AAAS Pacific Division, San Diego, California, June 14, 2011.
12. "Coherent Quantum Photovoltaics" talk given at Workshop in honor of prof. Charles Townes, Texas A&M University, May 12, 2011.
11. "Quantum photovoltaics via Coherent Drive" talk given at APS March Meeting, Dallas TX, March 21, 2011.
10. "Coherence in quantum photovoltaics" talk given at Institute of Quantum Science and Engineering Workshop, Texas A&M University, January 12, 2011.

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9. "Cooperative spontaneous emission of N atoms in spheroidal geometry" poster presented at the 41st Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 2-6, 2011.
8. "Reducing the collisional dephasing in B plasma by strong electric field" talk given at Special topics in Quantum Optics and Laser Physics lectures (Phys 689), Texas A&M University, November 22, 2010.
7. "Reducing the collisional dephasing by partially separating electrons and ions in plasma by strong electric field", presented at TAMU/Princeton Workshop on XUV LWI, Princeton, NJ, November 19, 2010.
6. "Quantum photovoltaics via coherent drive", "Quantum photovoltaic via Fano interference" talks given at Special topics in Quantum Optics and Laser Physics lectures (Phys 689), Texas A&M University, November 9, 2010.
5. "Fluctuations in Mesoscopic Weakly-Interacting Bose-Einstein Condensate", "Solar cell Physics. From basic concepts to quantum coherence" talks given at TAMU/Princeton Workshop on Quantum Science and Engineering, Casper, WY, July 18-30, 2010.
4. "Mesoscopic BEC and Solar Cell Technologies", talk given at Special Atomic and Molecular Optics Seminar, Texas A&M University, December, 18 2009.
3. "Two-level trap model of Bose-Einstein Condensation in an ideal gas", presented at the Conf. 2009 Spring Meeting of the Texas Sections of the APS, AAPT, and SPS, Stephenville, TX, April 2009.
2. "Mesoscopic effects in Bose-Einstein Condensate fluctuations of a weakly interacting gas in a box", presented at the Texas & Four Corners Sections American Physical Society Joint Meeting, El Paso, TX, October 2008 (Books of abstracts p. 21).
1. "Mode selection and amplification in open waveguides with planar Bragg structures", presented at the Conf. Coherent Control of the Fund. Proc. in Opt. and X-ray Opt., Inst. Of Appl.Phys. RAS. N. Novgorod, Russia, July 2006.

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