Biography

Dmitry V. Strekalov

Department of Physics, Rice University
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Degrees in Physics

Ph.D. (1997) University of Maryland Baltimore County, Baltimore, Maryland. *Optics of Biphoton*.
M.S. (1994) Moscow State University, Moscow, Russia. *The Interference of Intensities of Raman-Scattered Light.*
B.S. (1992) Moscow State University, Moscow, Russia.

Practical Experience

September 2000 – now *Jet Propulsion Lab, Caltech* Senior Engineer
Organization and operating a new quantum optics lab.

1999 - 2000 *Physics Department of Rice University* Postdoctoral Researcher
BEC of Lithium. Photoassociation in cold Lithium cloud. Growth/collapse dynamics of Lithium condensate.
Techniques: Dye and diode lasers and amplifiers, their phaselocking, fibers, electrooptics, UHV, RF, Raman and FM spectroscopy, optical interferometry, optical design, environment stabilization.

1997 - 99 *Physics Department of New York University* Postdoctoral Researcher
Laser cooling and trapping of Rb atoms, building atomic beam apparatus. Atomic density and coherence gratings in traps and beams for creating of nanostructures and for phase-space imaging.
Techniques: Solid state and diode lasers, optical heterodyne detection of weak light fields, electrooptics, UHV, RF, Labview, Mathematica, FM spectroscopy, environment stabilization, optical design, electronics.

1994 - 97 *Physics Department of UMBC* Graduate Research Assistant
Two-photon interference of light produced in parametric down-conversion. EPR-Bell measurements.
Techniques: CW UV lasers, nonlinear crystals, photon counting avalanche photodetectors, optical design.

1992 - 94 *Physics Department of Moscow State University* Part-time Research Assistant
Raman and correlation spectroscopy of excitations in condenced matter.
Techniques: Optical and electronics design, lasers: Cu-vapor (built one), Ar and Cd, dielectric mirrors deposition, vacuum systems, spectroscopy, glass blowing, high voltage/high current sources.

1993 *Institute for Physics, Russian Academy of Science* Volunteer
Experimental study of properties of glass matrices dye lasers.
Techniques: Pulsed YAG laser, basic optics.

1992 *Volnotech Ltd.* Engineer
Design of an asynchronal electro motor with tunable rotation frequency.
Techniques: Mechanical and electrical design, magnetodynamics, ferromagnets.

Teaching Experience

Graduate student advising:

1998 A.V. Turlapov, MS *Atom Interferometry in Off-Resonant Optical Standing Waves* at Advanced School of General and Applied Physics, Nizhniy Novgorod State University, Nizhniy Novgorod, Russia.

Course work:

1997 *Physics Department of NYU* Adjunct
Holding recitations for an undergraduate Electricity and Magnetism class (about 10 students).

1994 *Physics Department of UMBC* Graduate Teaching Assistant
Grading homework and consulting undergraduate students on quantum mechanics and mathematics (two groups of about 25 students).

Publications in Refereed Journals[1]

1. *Two-Photon Interferometry for High-Resolution Imaging*, D.V. Strekalov and J. P. Dowling, to appear in the Special Issue of Journal of Modern Optics (2001).
2. *Photodesorption of charged impurities from a transparent crystal surface*, V. N. Strekalov and D. V. Strekalov, Physical Review A **63**, 032901 (2001).
3. *Direct observation of growth and collapse of a Bose-Einstein condensate with attractive interactions*, J. M. Gerton, D. Strekalov, I. Prodan, R. G. Hulet, **Nature 408** Number 6813 Page 692 - 695 (2000).
4. *Experimental Study of A Subsystem in An Entangled Two-Photon State*, D.V. Strekalov, Yoon-Ho Kim and Y.H. Shih, Physical Review A, **60** 2685-88 (1999).
5. *Phase Space Imaging of Trapped Atoms Using Magnetic Sublevels Coherence*, D.V. Strekalov, A.V. Turlapov, A. Kumarakrishnan, S.B. Cahn and Tycho Sleator, SPIE proc. **3736**, 26-37 (1999): *Quantum Optics, Interference Phenomena in Atomic Systems and High-Precision Measurements*, A.V.Andreev, S.N.Bagayev, A.S.Chirkin, V.I.Denisov, Eds.
6. *Atomic Interference in Pulsed Standing Wave Fields*, A. Turlapov, D.V. Strekalov, A. Kumarakrishnan, S. B. Cahn and T. Sleator, SPIE proc. **3736**, 26-37 (1999): *Quantum Optics, Interference Phenomena in Atomic Systems and High-Precision Measurements*, A.V.Andreev, S.N.Bagayev, A.S.Chirkin, V.I.Denisov, Eds.
7. *Why two-photon but not two photons?*, Shih Y.H., Strekalov D.V., Pittiman T.B and Rubin M.H., Fortschritte der physik-progress of physics **46**, 627-641 (1998).
8. *What Can We Learn About Single Photons in a Two-Photon Experiment*, D.V. Strekalov, T.B. Pittman, and Y.H. Shih, Physical Review A, **57**, 567 (1998).
9. *Interference Effects in Spontaneous Two-Photon Parametric Scattering from Two Macroscopic Regions*, A.V. Burlakov, M.V. Chekhova, D.N. Klyshko, S.P. Kulik, A.N. Penin, Y.H. Shih, and D.V. Strekalov, Physical Review A, **56**, 3214 (1997).
10. *Two-Photon Geometrical Phase*, D.V. Strekalov and Y.H. Shih, Physical Review A, **56**, 3129 (1997).
11. *Can Two-Photon Interference be Considered the Interference of Two Photons?*, T.B. Pittman, D.V. Strekalov, A. Migdall, M.H. Rubin, A.V. Sergienko, and Y.H. Shih, Physical Review Letters, **77**, 1917 (1996).
12. *Postselection-Free Energy-Time Entanglement*, D.V. Strekalov, T.B. Pittman, A.V. Sergienko, Y.H. Shih, and P.G. Kwiat, Physical Review A, **54**, R1 (1996).
13. *Two-Photon Geometric Optics*, T.B. Pittman, D.V. Strekalov, A.V. Sergienko, M.H. Rubin, D.N. Klyshko, and Y.H. Shih, Physical Review A, **53**, 2804 (1996).
14. *Optical Imaging by Means of Two-Photon Quantum Entanglement*, T.B. Pittman, Y.H. Shih, D.V. Strekalov, and A.V. Sergienko, Physical Review A, **52**, 3429 (1995).
15. *Observation of Two-Photon Ghost Interference and Diffraction*, D.V. Strekalov, A.V. Sergienko, D.N. Klyshko, Y.H.Shih, Physical Review Letters, **74**, 3600 (1995).
16. *Forming of Polariton-like States by Optical Longitudinal Phonons*, D.V. Strekalov, Soviet Solid State Physics **36**, 10, 2896 (1994).

Professional Organizations, Services, Awards, Etc.

Since 1997: Refereeing papers for *Physical Review A* and *Physical Review Letters*.

1999: Robert A. Welch Foundation Postdoctoral Fellowship, Department of Physics, Rice University.

Member of American Physical Society and Optical Society of America.

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[1] Citation index 141 as of April 2001.

Conference Presentations

1. *Two-Photon Interferometry for High-Resolution Imaging*, D.V. Strekalov and J. P. Dowling, Physics of Quantum Electronics January 7-11, Snowbird, Utah (2001).
2. *Two-Photon Interferometry for High-Resolution Imaging*, D.V. Strekalov and J. P. Dowling, SquInT, Pasadena, CA, March 2-4 (2001)
3. *Quantum Lithography*, D.V. Strekalov, J. P. Dowling and Y.H. Shih, Nanospace-2001, Galveston, TX, March 12-16 (2001).
4. *Hyper Parametric Scattering: A Next Generation Source of Entangled Photons*, D.V. Strekalov, J. P. Dowling and D. Jackson, QUIST, Greenbelt, MD, October 23-24 (2000).
5. *Producing Ultracold Lithium Dimers*, D. Strekalov, J. Gerton, I. Prodan, R. Hulet, DAMOP Annual meeting, Storrs, CT, June 14-17 (2000).
6. *Vibrational Relaxation in Magnetically trapped Lithium Dimers*, J. Gerton, D. Strekalov, I. Prodan, R. Hulet, QELS, San Fransisco, CA, May 8-14, (2000).
7. *Phase Space Imaging of Trapped Atoms Using Magnetic Sublevels Coherence*, D.V. Strekalov, A.V. Turlapov, A. Kumarakrishnan, S.B. Cahn and Tycho Sleator, Centennial Meeting of the American Physical Society, Atlanta, Georgia, March 20-26, (1999).
8. *Sub-optical wavelength atomic gratings generated in a time-domain interferometer*, A.V. Turlapov, D.V. Strekalov, A. Kumarakrishnan, S.B. Cahn and Tycho Sleator, Centennial Meeting of the American Physical Society, Atlanta, Georgia, March 20-26, (1999).
9. *Phase Space Imaging of Trapped Atoms Using Magnetic Sublevels Coherence*, D.V. Strekalov, A.V. Turlapov, A. Kumarakrishnan, S. B. Cahn, U. Shim and Tycho Sleator, DAMOP Annual Meeting, Santa Fe, New Mexico, May 27-30, (1998).
10. *Atomic Interference in Spatially Separated Laser Fields*, A. Kumarakrishnan, A. Karpf, Z. Khaliq, D.V. Strekalov, A.V. Turlapov and Tycho Sleator, DAMOP Annual Meeting, Santa Fe, New Mexico, May 27-30, (1998).
11. *Measurement of Phase Space Density of Trapped Atoms Using Magnetic Sub Level Coherence*, D.V. Strekalov, A. Kumarakrishnan, S. B. Cahn, U. Shim and Tycho Sleator, Optical Society of America Annual Meeting, Long Beach, California, October 12-17, (1997).
12. *Single Detector Measurement of a Two-photon State*, D.V. Strekalov, Y.H. Shih, Fundamental Problems in Quantum Theory, Baltimore, Maryland, August 4 -7, (1997).
13. *Why a Biphoton but not Two Photons?*, Y.H. Shih, D.V. Strekalov and T.B. Pittman, Fundamental Problems in Quantum Theory, Baltimore, Maryland, August 4 -7, (1997).
14. **Invited** *Why a Biphoton but not Two Photons?*, D.V. Strekalov, T.B. Pittman, M.H. Rubin, and Y.H. Shih, 26th Winter Colloquium on the Physics of Quantum Electronics, January 12-15, Snowbird, Utah (1997).
15. *Three-phase Biphoton Interference*, D.V. Strekalov, Y.H. Shih, D.N. Klyshko and S.P. Kulik, Quantum Electronics and Laser Science, Baltimore, Maryland, May 18-23 (1997).
16. *Why Biphoton But Not Two Photons?*, D.V. Strekalov, T.B. Pittman, M.H. Rubin and Y.H. Shih, Quantum Electronics and Laser Science, Baltimore, Maryland, May 18-23 (1997).
17. *Why Two-Photon But Not Two Photons?*, Y.H. Shih, D.V. Strekalov, and T.B. Pittman, International Conference on Quantum Optics and Laser Physics, Hong Kong, January 3-8 (1997).
18. *Two-Photon Interference and Indistinguishability*, D.V. Strekalov, T.B. Pittman, M.H. Rubin, and Y.H. Shih, Optical Society of America Annual Meeting, October 20-24, Rochester, New York (1996).
19. *Two-Photon Interference With Postponed Compensation and Quantum Vernier Effect*, A.V. Sergienko, T.B. Pittman, D.V. Strekalov, M.H. Rubin, Y.H. Shih, A. Migdall, R. Datla, Optical Society of America Annual Meeting, October 20-24, Rochester, New York (1996).
20. *Demonstration of the Violation of Local Realism in a Four-Photon Interference Experiment*, D.V. Strekalov, T.B. Pittman, M.H. Rubin, A.V. Sergienko, and Y.H. Shih, Adriatico Research Conference on Quantum Interferometry II, March 4 - 8, Trieste, Italy (1996).
21. *Postponed Compensation and Indistinguishability in Two-Photon Interference Experiments*, T.B. Pittman, D.V. Strekalov, A. Migdall, M.H. Rubin, A.V. Sergienko, and Y.H. Shih, Adriatico Research Conference on Quantum Interferometry II, March 4 - 8, Trieste, Italy (1996).
22. *Experimental Demonstration of Geometrical Imaging and "Ghost" Interference - Diffraction by Means of Two-Photon Entangled States*, A.V. Sergienko, Y.H. Shih, M.H. Rubin, T.B. Pittman, D.V. Strekalov, and D.N. Klyshko. Adriatico Research Conference on Quantum Interferometry II, March 4 - 8, Trieste, Italy (1996).

23. *Spatial Correlations of the Biphoton and Two-Photon Optics*, M.H. Rubin, T.B. Pittman, D.V. Strekalov, Y.H. Shih, and A.V. Sergienko, Adriatico Research Conference on Quantum Interferometry II, March 4 - 8, Trieste, Italy (1996).
24. *Observation of the Four-Photon Interference*, D.V. Strekalov, Y.H. Shih, A.V. Sergienko, T.B. Pittman, and M.H. Rubin, Optical Society of America Annual Meeting, September 10-15, Portland, Oregon (1995).
25. *Geometric Optic Imaging by means of Einstein-Podolsky-Rosen-like Quantum Correlations*, T.B. Pittman, D.V. Strekalov, A.V. Sergienko,D.N. Klyshko, M.H. Rubin, and Y.H. Shih, Optical Society of America Annual Meeting, September 10-15, Portland, Oregon (1995).
26. *Observation of Two-Photon "Virtual" Interference and Diffraction*, D.V. Strekalov, D.N. Klyshko, Y.H. Shih, A.V. Sergienko, Technical Digest of the 15th International Conference on Nonlinear Optics, June 27-31, St. Petersburg, Russia (1995).
27. *Observation of "Ghost" Image and Diffraction-Interference Effects*, Y.H. Shih, A.V. Sergienko, T.B. Pittman, D.V. Strekalov, and D.N. Klyshko, Proceedings of the New York Academy of Sciences Conference on Fundamental Problems In Quantum Theory, June 18-22, Baltimore, Maryland (1994).
28. *Multiparticle Interferometry based on Double Entangled States*, T.B. Pittman, Y.H. Shih, D.V. Strekalov, A.V. Sergienko, and M.H.Rubin, Proceedings of The Fourth International Conference on Squeezed States and Uncertainty Relations, June 5-8, Taiyuan, China (1995).
29. *Two-Photon "Ghost" Image and Interference-Diffraction*, Y.H. Shih, A.V. Sergienko, T.B. Pittman, D.V. Strekalov, and D.N. Klyshko, Proceedings of The Fourth International Conference on Squeezed States and Uncertainty Relations, June 5-8, Taiyuan, China (1995).
30. *Demonstration of Inconsistency of Local Realism Using Double-entangled Photons*, D.V. Strekalov, T.B. Pittman, M.H. Rubin, and Y.H. Shih, Quantum Electronics and Laser Science Conference, June 2-7, Anaheim, California, (1995).
31. *Two-Photon "Ghost" Image and Quantum "Cryptofax"*, Y.H. Shih, T.B. Pittman, A.V. Sergienko, and D.V. Strekalov, Technical Digest of the Quantum Electronics and Laser Science Conference, May 21-26, Baltimore, Maryland, 16, 52 (1995).
32. *Multiparticle Interferometry based on Double Entangled States*, T.B. Pittman, D.V. Strekalov, A.V. Sergienko, Y.H. Shih, and M.H.Rubin, Joint Meeting of the American Physical Society and the American Society of Physics Teachers, April 18-22, Washington, D.C., A.P.S. Bulletin 40.2, 943 (1995).
33. *Two-Photon ``Ghost" Image and Interference-Diffraction*, Y.H. Shih, A.V. Sergienko, T.B. Pittman, and D.V. Strekalov, Joint Meeting of the American Physical Society and the American Society of Physics Teachers, April 18-22, Washington, D.C., A.P.S. Bulletin 40.2, 943 (1995).
34. *Two-Photon "Ghost" Image and Interference-Diffraction*, Y.H. Shih, A.V. Sergienko, T.B. Pittman, and D.V. Strekalov, 25th Winter Colloquium on Quantum Electronics, Snowbird, Utah (1995).