

# CURRICULUM VITAE

Anatoly A. Svidzinsky

## Present Address:

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## Education:

1988-1994, Moscow Institute of Physics and Technology, GPA=4.0  
 1994-1997, Graduate student, Moscow Institute of Physics and Technology, GPA=4.0  
 1991-1997, V.L. Ginzburg theory group, Lebedev Physical Institute, Moscow  
 1997-2000, Graduate student, Stanford University, GPA=4.0

## Degrees

1994, M.S. in Laser Physics, Summa Cum Laude, Moscow Institute of Physics and Technology, Russia  
 1997, Ph.D. in Physics, Moscow Institute of Physics and Technology, Russia  
 2001, Ph.D. in Physics, Stanford University, USA

## Appointments

Research Assistant Professor, Texas A&M University, July 2007 - present  
 Post-Doctoral Researcher, Texas A&M University, August 2003 - July 2007  
 Post-Doctoral Fellow, Bartol Research Institute, University of Delaware, February 2002 - July 2003  
 Post-Doctoral Fellow, Stanford University, January 2001 - January 2002  
 Research Assistant, Stanford University, 1997-2000  
 Teaching Assistant, Stanford University, 1998-1999  
 Teaching Assistant, Moscow Institute of Physics and Technology, 1993-1994

## Teaching experience

2010 Fall semester, lecturer of Quantum Mechanics 2 (Physics 624), Texas A&M University  
 2008 Fall semester, visiting professor, recitation and lab instructor of Physics 218, Texas A&M University  
 2003 Fall semester, visiting professor, lecturer and recitation instructor of Physics 202, Texas A&M University  
 1998-1999, Teaching assistant, Physics 61, 63, 64, 65, 66 "Advanced Freshman Physics", Stanford University.  
 1997, Lecturer of the course "Superconductivity", Moscow Institute of Physics and Technology.  
 1993-1994, Instructor, Correspondence School of MIPT.

## LIST OF PUBLICATIONS

### Theses

1. A.A. Svidzinsky, “Magnetic and transport properties of superconductors with anisotropic pairing”, Ph.D. thesis, Moscow Institute of Physics and Technology, Russia, 1997.
2. A.A. Svidzinsky, “Vortices in a trapped dilute Bose-Einstein condensate”, Ph.D. thesis, Stanford University, USA, 2000.

### Superconductivity

3. A.A. Svidzinsky, “Possible cooling effect in high temperature superconductors”, *Physical Review B* **61**, 144504 (2002).
4. Yu.S. Barash and A.A. Svidzinsky, “Comment on ”Electrical transport in junctions between unconventional superconductors: Application of the Green’s-function formalism”, *Physical Review B* **61**, 12516 (2000).
5. Yu.S. Barash and A.A. Svidzinsky, “Nonmonotonic magnetic-field dependence and scaling of the thermal conductivity for superconductors with nodes of the order parameter”, *Physical Review B* **58**, 6476 (1998).
6. Yu.S. Barash, A.A. Svidzinsky and V.P. Mineev, “Effect of impurities on the low-temperature behavior of the specific heat of anisotropic superconductors in a mixed state”, *JETP Letters* **65**, 638 (1997).
7. Yu.S. Barash, A.A. Svidzinsky and H. Burkhardt, “Quasiparticle bound states and low-temperature peaks of the conductance of NIS junctions in d-wave superconductors”, *Physical Review B* **55**, 15282 (1997).
8. Yu.S. Barash and A.A. Svidzinsky, “Current-voltage characteristics of tunnel junctions between superconductors with anisotropic pairing”, *JETP* **84**, 619 (1997).
9. Yu.S. Barash and A.A. Svidzinsky, “Josephson and quasiparticle tunneling between anisotropically paired superconductors”, in “Quasiclassical theory of superconductivity in strongly correlated systems”, eds. D. Rainer and J. Sauls, Springer-Verlag, 1996, p. 27.
10. A.A. Svidzinsky, “Anisotropy of the upper critical field in a tetragonal unconventional superconductor”, *Phystech-Journal*, **2**, 60 (1996).
11. Yu.S. Barash and A.A. Svidzinsky, “Low-temperature heat capacity of the mixed state of superconductors with anisotropic pairing”, *JETP Letters* **63**, 365 (1996).
12. Yu.S. Barash and A.A. Svidzinsky, “Low-temperature properties and specific anisotropy of pure anisotropically paired superconductors”, *Physical Review B* **53**, 15254 (1996).
13. Yu.S. Barash and A.A. Svidzinsky, “Low-temperature behavior of the thermal conductivity in pure superconductors with anisotropic pairing”, *JETP Letters* **63**, 296 (1996).
14. Yu.S. Barash and A.A. Svidzinsky, “Josephson and quasiparticle tunneling between anisotropically paired superconductors in the presence of externally applied voltage”, *Czechoslovak Journal of Physics* **46**, 1013 (1996).
15. Yu.S. Barash, A.V. Galaktionov and A.A. Svidzinsky, “Upper critical field for an unconventional superconducting film: a kink due to the boundary conditions”, *Physical Review B* **52**, 10344 (1995).
16. Yu.S. Barash, A.V. Galaktionov and A.A. Svidzinsky, “Upper critical field for an unconventional superconducting film: a kink due to the boundary conditions”, *Proceedings of the 5th International Symposium on Nonhomogeneous Electron States, Novosibirsk, September 1995*, p. 26.
17. A.A. Svidzinsky, “Current-voltage characteristics of tunnel junctions between anisotropically paired superconductors”, *Proceedings of the 39th Scientific Conference of Moscow Institute of Physics and Technology, Moscow, 1996*, p. 41.

### Bose-Einstein Condensation/Quantum Optics

18. A.A. Svidzinsky, “Spontaneous emission from cylindrical atomic cloud: Collective eigenstates and non-local effects”, *Optics Communications* **284**, 269 (2011).
19. A.A. Svidzinsky and M.O. Scully, “Condensation of N bosons VI: microscopic approach to fluctuations in interacting Bose gas”, to appear in *Physical Review A* (2011).
20. M.O. Scully and A.A. Svidzinsky, “The Lamb Shift—Yesterday, Today, and Tomorrow”, *Science* **328**, 1239 (2010).
21. A.A. Svidzinsky, J.-T. Chang and M.O. Scully, “Cooperative spontaneous emission of N atoms: many-body eigenstates, effect of virtual Lamb shift processes and analogy with radiation of N classical oscillators”, *Physical Review A* **81**, 053821 (2010).

22. E.A. Sete, A.A. Svidzinsky, Yu.V. Rostovtsev, S. Suckewer and M.O. Scully, "Using quantum coherence to generate gain in the XUV: Gain swept superradiance and lasing without inversion", to appear in IEEE (2011).
23. E.A. Sete, A.A. Svidzinsky, H. Eleuch, R.D. Nevels and M.O. Scully, "Correlated spontaneous emission on the Danube", *Journal of Modern Optics* **57**, 1311 (2010).
24. A.A. Svidzinsky and M.O. Scully, "On the evolution of N-atom state prepared by absorption of a single photon", *Optics Communications* **283**, 753 (2010).
25. M.O. Scully and A.A. Svidzinsky, "The Super of Superradiance", *Science* **325**, 1510 (2009).
26. A.A. Svidzinsky and M.O. Scully, "Evolution of collective N atom states in single photon superradiance: Effect of virtual Lamb shift processes", *Optics Communications* **282**, 2894 (2009).
27. Yu.V. Rostovtsev, H. Eleuch, A.A. Svidzinsky, H. Li, V. Sautenkov and M.O. Scully, "Excitation of atomic coherence using off-resonant strong laser pulses", *Physical Review A* **79**, 063833 (2009).
28. M.O. Scully and A.A. Svidzinsky, "The effects of the N atom collective Lamb shift on single photon superradiance", *Physics Letters A* **373**, 1283 (2009).
29. A.S. Sizhuk, A.A. Svidzinsky and M. O. Scully, "Fluctuations in two component interacting Bose-Einstein condensate", Middleton book (2011).
30. A.A. Svidzinsky, J.T. Chang, H. Lipkin and M.O. Scully, "Fermi's Golden Rule does not adequately describe Dicke's Superradiance", *Journal of Modern Optics* **55**, 3369 (2008).
31. M.O. Scully, Yu. Rostovtsev, A.A. Svidzinsky and J.T. Chang, "XUV Coherent Raman Superradiance", *Journal of Modern Optics* **55**, 3219 (2008).
32. A.A. Svidzinsky and J.T. Chang, Comment on: "Effects of including the counterrotating term and virtual photons on the eigenfunctions and eigenvalues of a scalar photon collective emission theory", *Physics Letters A*, **372**, 5732 (2008).
33. A.A. Svidzinsky, J.T. Chang and M.O. Scully, "Dynamical evolution of correlated spontaneous emission of a single photon from a uniformly excited cloud of N atoms", *Physical Review Letters*, **100**, 160504 (2008).
34. A.A. Svidzinsky and J.T. Chang, "Cooperative spontaneous emission as a many body eigenvalue problem", *Physical Review A*, **77**, 043833 (2008).
35. D.M. Greenberger, N. Erez, M.O. Scully, A.A. Svidzinsky and M.S. Zubairy, "Planck, photon statistics and Bose-Einstein condensation", review paper, *Progress in Optics*, Ed. E. Wolf, **50**, 275-330 (2007).
36. M. Kim, A.A. Svidzinsky and M.O. Scully, "Solving open questions in the Bose-Einstein Condensation of an ideal gas via a hybrid mixture of laser and statistical physics", in *Beyond the Quantum*, Eds. T.M. Nieuwenhuizen et al., World Scientific, Singapore (2007), pp. 91-106.
37. A.A. Svidzinsky and M.O. Scully, "Condensation of N interacting bosons: Hybrid approach to condensate fluctuations", *Physical Review Letters* **97**, 190402 (2006).
38. A.N. Jordan, C.H.R. Ooi and A.A. Svidzinsky, "Fluctuation statistics of mesoscopic Bose-Einstein condensate: reconciling the master equation with the partition function to revisit the Uhlenbeck-Einstein dilemma", *Physical Review A* **74**, 032506 (2006).
39. M.O. Scully and A.A. Svidzinsky, "Condensation of N bosons IV: A simplified Bogoliubov master equation analysis of fluctuations in an interacting Bose gas", *Journal of Modern Optics*, **53**, p.2399-2418 (2006).
40. V.V. Kocharovskiy, V.I. Kocharovskiy, M. Holthaus, C.H.R. Ooi, A.A. Svidzinsky, W. Ketterle and M.O. Scully, "Fluctuations in Ideal and Interacting Bose-Einstein Condensates: From the laser phase transition analogy to squeezed states and Bogoliubov quasiparticles", review paper, *Advances in Atomic, Molecular and Optical Physics*, V. **53**, 293-412 (2006).
41. A.A. Svidzinsky, S.T. Chui "Insulator-Superfluid transition of spin-1 bosons in an optical lattice in magnetic field", *Physical Review A* **68**, 043612 (2003).
42. A.A. Svidzinsky and S.T. Chui, "Normal modes and stability of phase-separated trapped Bose-Einstein condensates", *Physical Review A* **68**, 013612 (2003).
43. A.A. Svidzinsky, S.T. Chui, "Symmetric-Asymmetric transition in mixtures of Bose-Einstein condensates", *Physical Review A* **67**, 053608 (2003).
44. D.L. Feder, A.A. Svidzinsky, A.L. Fetter, and C.W. Clark, "Anomalous modes drive vortex dynamics in confined Bose-Einstein condensates", *Physical Review Letters* **86**, 564 (2001).
45. A.L. Fetter and A.A. Svidzinsky, "Vortices in a trapped dilute Bose-Einstein condensate", *Journal of Physics: Condensed Matter* **13**, p. R135-R194 (2001).
46. A.A. Svidzinsky and A.L. Fetter, "Dynamics of a vortex in a trapped Bose-Einstein Condensate", *Physical Review A* **62**, 063617 (2000).
47. A.A. Svidzinsky and A.L. Fetter, "Stability of a vortex in a trapped Bose-Einstein Condensate", *Physical Review Letters* **84**, 5919 (2000).
48. A.A. Svidzinsky and A.L. Fetter, "Vortex state structure of a Bose condensate in an asymmetric trap", *Physica B* **284-288**, 21 (2000).

49. A.A. Svidzinsky and A.L. Fetter, “Normal modes of a vortex in a trapped Bose-Einstein condensate”, *Physical Review A* **58**, 3168 (1998).
50. A.L. Fetter and A.A. Svidzinsky, “Stability of a vortex in a rotating trapped Bose-Einstein condensate”, *Proceedings of the Conference on quantized vortex dynamics and superfluid turbulence*, The Newton Institute, Cambridge, England, August 14-18, 2000.

## Chemical Physics

51. A.A. Svidzinsky, G. Chen, S.A. Chin, M. Kim, D. Ma, R.K. Murawski, A. Sergeev, M.O. Scully and D.R. Herschbach, “Bohr model and dimensional scaling analysis of atoms and molecules”, *International Reviews in Physical Chemistry*, **27**, 665-723 (2008).
52. A.A. Svidzinsky, S.A. Chin and M.O. Scully, “Model of molecular bonding based on the Bohr-Sommerfeld picture of atoms”, *Physics Letters A* **355**, 373 (2006).
53. A.A. Svidzinsky, M.O. Scully, and D.R. Herschbach, “Simple and surprisingly accurate approach to the chemical bond obtained from dimensional scaling analysis”, *Physical Review Letters* **95**, 080401 (2005). The paper has been highlighted by *Science* v. 309, 2 September 2005, p. 1459.
54. A.A. Svidzinsky, M.O. Scully, and D.R. Herschbach, “Bohr’s 1913 molecular model revisited”, *PNAS* **102**, 11985 (2005). The paper has been highlighted by *Nature* 25 August 2005 .
55. M.O. Scully, R.A. Allen, Y. Dou, K.T. Kapale, M. Kim, G. Chen and A.A. Svidzinsky, “Molecular calculations with two-center correlated orbitals”, *Chemical Physics Letters* **389**, 385 (2004).
56. G. Chen, S.A. Chin, Y. Dou, K.T. Kapale, M. Kim, A.A. Svidzinsky, K. Urtekin, H. Xiong, M.O. Scully, ”The two-electron molecular bond revisited: from Bohr orbits to two-center orbitals”, review paper, *Advances in Atomic, Molecular and Optical Physics*, v. **51**, Edited by H.H. Stroke, Elsevier (2005), pp. 93-238.
57. R.K. Murawski and A.A. Svidzinsky, “Quantum number dimensional scaling analysis for excited states of multielectron atoms”, *Physical Review A* **74**, 042507 (2006).

## Astrophysics

58. A.A. Svidzinsky, “Radiation of neutron stars produced by superfluid core”, *Astrophysical Journal*, **590**, 386 (2003).
59. A.A. Svidzinsky, “Intrinsically faint quasars: evidence for meV axion dark matter in the Universe”, *Proceedings of the 5th International Conference on Dark Matter in Astro and Particle Physics DARK 2004*, College Station, 3-9 October, 2004, Eds. H.V. Klapdor-Kleingrothaus and R. Arnowitt, Springer, p. 523 (2005).
60. A.A. Svidzinsky, “Quasars as bubbles of dark matter: evidence for axion and tachyon matter in the Universe”, astro-ph/0409064.
61. A.A. Svidzinsky, “Oscillating axion bubbles as alternative to supermassive black holes at galactic centers”, *Journal of Cosmology and Astroparticle Physics* **10** (2007) 018. The paper has been highlighted by *New Scientist*, v. 191 No 2561, 22 July 2006, p. 11.
62. A.A. Svidzinsky, “Vector theory of gravity in Minkowski space-time: flat Universe without black holes”, eprint arXiv:0904.3155 (2009).

## Awards and Honors

Stanford Graduate Fellowship, 1997-2000  
 Fellowship of the President of the Russian Federation, 1996-1997  
 George Soros Graduate Fellowship, 1995-1996  
 Landau Fellowship from Forschungszentrum Jülich, 1994-1996  
 Fellowship of the Lebedev Physical Institute, 1994  
 2nd place, Physical Olympiad of Moscow Institute of Physics and Technology, 1991  
 6th place, Mathematical Olympiad of Moscow Institute of Physics and Technology, 1989  
 2nd place, International tournament of young physicists, Moscow, 1988

1st place, Physical Olympiad of Kiev city, Ukraine, 1988

1st place, Physical and Mathematical Olympiad of Moscow Institute of Physics and Technology, 1988

### Conferences and Invited Talks

1. 38th Scientific Conference of Moscow Institute of Physics and Technology, Moscow, Russia, November 1994.
2. 5th International Symposium on Nonhomogeneous Electron States, Novosibirsk, Russia, September 1995.
3. International Conference "Superconductivity: Physical aspects", Kharkov, Ukraine, September 1995.
4. Summer School on Condensed Matter Physics "Symmetry of the order parameter in high temperature superconductors", Ankara, Turkey, June 1996.
5. 39th Scientific Conference of Moscow Institute of Physics and Technology, Moscow, Russia, November 1996.
6. Invited talk "Current-voltage characteristics of tunnel junctions in anisotropically paired superconductors", V. L. Ginzburg Moscow seminar, February 19, 1997.
7. Invited talk "Magnetic and transport properties of high temperature superconductors", Moscow State Engineering Physics Institute, April, 1997.
8. 22nd International Conference on Low Temperature Physics, Helsinki, Finland, August 4-11, 1999.
9. March Meeting of the American Physical Society, Minneapolis, USA, March 20-24, 2000.
10. Workshop on Bose-Einstein condensation, Lorentz Center, Leiden University, the Netherlands, April 22 – June 9, 2000.
11. Workshop "Rotating Bose-Einstein Condensates", European Centre for Theoretical Studies in Nuclear Physics and Related Areas, Trento, Italy, June 11-13, 2000.
12. Invited talk "Vortices in Bose superfluids and radiation of neutron stars", San Jose State University, April 18, 2001.
13. Workshop on "Fundamental Issues of Quantum Gases", Aspen Center for Physics, Aspen, USA, June 17-July 8, 2001.
14. Invited talk "Radiation of neutron stars produced by superfluid core", University of Delaware, April, 2002.
15. International Conference "Cooling 2002", Visby, Sweden, June 8-12, 2002.
16. Invited talk "Radiation of neutron stars produced by superfluid core" presented at the International workshop "Effective Summer in Berkeley", Lawrence-Berkeley National Laboratory, July 7- August 1, 2003.
17. Invited talk "Intrinsically faint quasars: evidence for meV axion dark matter in the Universe", Fifth International Heidelberg Conference on DARK MATTER IN ASTRO AND PARTICLE PHYSICS", Texas A&M University, 3-9 October, 2004.
18. 35th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 2-6, 2005.
19. "Bohr model analysis of diatomic molecules", talk given at Quantum Optics Symposium, Texas A&M University, January 10-12, 2005.
20. "Bohr model and dimensional scaling analysis of diatomic molecules", talk given at JSPS-PRISM-TAMU Symposium on Quantum Materials Science, Princeton University, February 21-22, 2005.
21. "Constrained Bohr model description of molecular bonding", "Fluctuations in finite N particle Bose-Einstein condensates: Canonical versus Grand Canonical statistics", talks presented at Casper Workshop on Quantum Optics and Chemical Physics, Casper College, Wyoming, August 15-19, 2005.
22. "Faint quasars as Bose-Einstein condensate of axions", "Hybrid techniques for calculating BEC fluctuations", talks presented at Princeton-TAMU BEC Symposium, Princeton, October 14-15, 2005.
23. "Bohr model and dimensional scaling analysis of atoms and molecules", talk given at Condensed Matter Seminar, Texas A&M University, November 2, 2005.
24. "D-scaling, Bohr model and Chemical Physics", Plenary talk given at the 36th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 2-6, 2006.

25. “D-scaling, Bohr model and Chemical Physics”, poster presented at DARPA/TAMU workshop on anthrax detection, January 23, 2006.
26. “Bose-Einstein condensation: fundamental concepts and fluctuations”, Colloquium given at Texas A&M University, College Station, Texas, January 26, 2006.
27. “Fluctuations in Bose-Einstein condensate”, poster presented at Wheelerfest, Princeton University, February 24-25, 2006.
28. “Molecular physics from Bohr and QCD: Dimensional scaling analysis”, talk presented at Princeton-TAMU Molecular Physics Symposium, Princeton University, May 18-19, 2006.
29. “Hybrid approach to fluctuations in mesoscopic interacting Bose-Einstein condensate”, talk presented at the International Conference “Coherent Control of the Fundamental Processes in Optics and X-ray-Optics (CCFP’2006)”, Nizhny Novgorod, Russia, June 29 - July 3, 2006.
30. “Gravity, supermassive ”black holes” at galactic centers and dark matter problem”, talk given at the Joint Nuclear Physics and Astrophysics Colloquium, Texas A&M University, October 24, 2006.
31. “Master equation analysis of fluctuations in interacting BEC”, talk given at the 37th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 2-6, 2007.
32. “Recent thoughts on non-equilibrium BEC: Hybrid approach to fluctuations in mesoscopic interacting Bose-Einstein condensate”, talk given at TAMU molecular physics and quantum optics symposium, January 9-10, 2007.
33. “Interface between AMO, quantum optics and many body theory: Dimensional scaling analysis of molecules, BEC statistics and correlated spontaneous emission of N atoms”, talk given at the Physics Colloquium, Texas A&M University, January 16, 2007.
34. “Bohr’n again”, talk given at the Princeton-TAMU Fundamental Aspects of Quantum Mechanics Symposium, Princeton University, February 16-17, 2007.
35. “Superradiance as an Eigenvalue Problem”, talk given at the Princeton-TAMU Symposium on Quantum Coherence and Laser Spectroscopy, Princeton University, March 16-17, 2007.
36. “Hybrid approach to fluctuations in mesoscopic interacting BEC”, talk given at the Princeton-TAMU Symposium on Quantum Mechanics, Informatics and Control, Princeton University, April 6-7, 2007.
37. “Bohr model and dimensional scaling analysis of atoms and molecules”, talk presented at Casper Workshop on Quantum Optics and Chemical Physics, Casper College, Wyoming, July 15-21, 2007.
38. “Fluctuations in Bose-Einstein condensate”, talk given at the Middleton Meeting on Classical, Semiclassical and Quantum Noise, Princeton University, November 2-3, 2007.
39. “Hybrid approach to fluctuations in mesoscopic interacting Bose-Einstein condensate”, talk presented at the 38th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 6-10, 2008.
40. “Cooperative spontaneous emission as a many body eigenvalue problem”, talk given at TAMU Physics of Quantum Electronics Symposium, College Station, Texas, January 15-16, 2008.
41. “Cooperative spontaneous emission of N atoms: effect of virtual photons and classical analogy with N harmonic oscillators”, talk presented at the 39th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 4-8, 2009.
42. “Cooperative spontaneous emission of N atoms: many-body eigenstates and their decay”, talk given at TAMU Physics of Quantum Electronics Symposium, College Station, Texas, January 13-14, 2009.
43. “Superradiance as many-body eigenvalue problem”, talk given at Condensed Matter Seminar, Texas A&M University, February 11, 2009.
44. “Evolution of collective N atom states in single photon superradiance: effect of virtual Lamb shift processes”, talk given at TAMU mini-workshop on the Lamb shift and Dicke superradiance, Texas A&M University, April 13, 2009.
45. “Evolution of collective N atom states in single photon superradiance: effect of virtual Lamb shift processes”, talk given at TAMU/Princeton Workshop on Quantum Science and Engineering, Jackson Hole, WY, August 2-8, 2009.
46. “Vector Theory of Gravity in Minkowski Space-Time: Flat Universe Without Black Holes”, talk given at Applied Math Seminar, Texas A&M University, November 9, 2009.
47. “Design of a quantum well (dot) solar energy convertor utilizing broad solar spectrum”, talk presented at the 40th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January 4-7, 2010.
48. “Design of a quantum well (dot) solar energy convertor utilizing broad solar spectrum”, talk given at TAMU Physics of Quantum Electronics Workshop, College Station, Texas, January 12-13, 2010.
49. “Cooperative spontaneous emission of N atoms: effect of virtual photons and analogy with radiation of N classical oscillators”, talk presented at XIII International Conference on Quantum Optics and Quantum Information, May 28 – June 1, 2010, Kyiv, Ukraine.

50. “Cooperative spontaneous emission of N atoms: many-body eigenstates, effect of virtual photons and analogy with radiation of N classical oscillators”, talk given at Fifth International Workshop “Relaxed, nonlinear and acoustic optical processes and materials”, June 1-5, 2010, Lutsk and Lake “Svityaz”, Ukraine.

51. “Lasing without inversion in transient regime”, “Bohr model and dimensional scaling analysis of atoms and molecules”, talks given at TAMU/Princeton Workshop on Quantum Science and Engineering, Casper, WY, July 18-30, 2010.

52. “Collective spontaneous emission of N atoms: eigenstates, effect of virtual photons and analogy with radiation of classical oscillators”, talk given at the “Mathematics, Analysis and Control in Chemical Physics and Related Systems” conference, University of Nevada, Las Vegas December 14-17, 2010.

### **Conference organization**

Co-chair of JSPS-PRISM-TAMU Symposium on Quantum Materials Science, Princeton University, February 21-22, 2005.

Co-chair of Princeton-TAMU Symposium on Quantum Mechanics, Informatics and Control, Princeton University, April 6-7, 2007.

### **Editorial Activities**

Referee, Physical Review Letters, Physical Review A, Physical Review B, Physics Letters A, Journal of Modern Optics.