

## CURRICULUM VITAE of Yan Soibelman

**PERSONAL:** Born 15 April 1956, Kiev, USSR; widowed, 1 child

**ADDRESS:** Department of Mathematics  
Kansas State University  
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### RESEARCH INTERESTS:

Deformation theory, quantum groups, algebraic geometry,  
topology, symplectic geometry, representation theory,  
non-commutative geometry, differential equations,  
mathematical physics, string theory

### LANGUAGES SPOKEN:

English, Russian, Ukrainian

### DEGREES:

M.S., 1978, Mathematical Department, Rostov University, USSR

Ph.D., 1985, Mathematical Department, Rostov University, USSR

### EXPERIENCE:

1984-1990 Rostov University, USSR, Researcher and Assistant Professor,  
Department of Mathematics

1991 Cambridge University, UK, Visiting Professor,  
Department of Applied Mathematical Theoretical Physics

1991 Scuola Normale Superiore, Pisa, Italy, Visiting Professor

1991 Research Institute of Mathematical Sciences,  
Kyoto, Japan, Visiting Scholar

1991 Massachusetts Institute of Technology, Cambridge, MA,  
Visiting Scholar, Department of Mathematics

1992 Institute de Hautes Etude de Science, Bures-Sur-Yvette, France,  
Visiting Scholar

1992 Mathematical Sciences Research Institute, Berkeley, CA,  
Visiting Scholar

1992-1993 Harvard University, Cambridge, MA, Visiting Scholar,  
Department of Mathematics

1993 Max-Planck Institute für Mathematik, Bonn, Germany, Visiting Scholar

1993-1994 Institute for Advanced Study, Princeton, NJ, Visiting Member

1994-current Kansas State University, Manhattan, KS, Professor,  
Department of Mathematics

1994 Max-Planck Institute für Mathematik, Bonn, Germany,  
Visiting Professor

1995 University of York, York, UK, Visiting Professor

1995 IHES, Bures-Sur-Yvette, France, Visiting Scholar

1996 Harvard University, Boston, MA, Visiting Professor

1996 IHES, Bures-Sur-Yvette, France, Visiting Scholar

1997 Max-Planck Institute of Mathematics, Bonn, Visiting Scholar

1998 IHES, Bures-Sur-Yvette, France, Visiting Scholar

1999, Max-Planck Institute of Mathematics, Bonn, Visiting Scholar

2003,2005 Max-Planck Institute of Mathematics, Bonn, Visiting Scholar

1999-2006 IHES, Bures-Sur-Yvette, France, Visiting Scholar

1999-2000 Clay Mathematics Institute Fellow

2003-2004 Clay Mathematics Institute Fellow

### GRANTS AND AWARDS:

1. Sloan Foundation grants in 1991, 1992, and 1993; (visiting at MIT and Harvard University)
2. NSF grant in 1992; (visiting at Mathematical Research Science Institute at Berkeley)
3. NSF and the grant from the Institute for Advanced Study at Princeton, 1993-1994; (visiting at IAS)
4. Fellowship from the Max-Planck Institute für Mathematics in Bonn, Germany; (visiting at MPI)
5. SERC grant (United Kingdom) in 1991; (visiting at Cambridge University)
6. Grant from the Research Institute of Mathematical Sciences (Kyoto University) in 1991
7. SERC National Fellowship (United Kingdom) in 1992
8. Grant from the International Congress in Mathematical Physics (Paris) in 1994
9. Grant from the International Congress of Mathematicians (Zurich) in 1994
10. NSF grant (1996-1999), "Quantum Kac-Moody groups and related questions"
11. NSF and ICM-98 grant in 1998
12. Clay Mathematics Institute Fellowship 1999-2000, 2000-2001 CMI Emissary Fellowship), 2003-2004
13. CRDF grant, 2000-2001
14. NSF and ICM-2002 grant in 2002
15. NSF grant "Affine structures, non-archimedean analytic geometry and mirror symmetry", 2005-2008.

**HONORARY/PROFESSIONAL SOCIETIES:** American Mathematical Society

### PROFESSIONAL SERVICE:

Referee for the Communications in Mathematical Physics  
Referee for Advances in Mathematics  
Referee for the Letters in Mathematical Physics  
Referee for the Annals of Mathematics  
Referee for the Duke Journal of Mathematics  
Referee for the Mathematical Reviews  
Referee for Contemporary Mathematics  
Referee for Asian mathematical Journal  
Referee for Inventiones Mathematicae  
Referee for National Science Foundation  
Referee for Journal of Differential Geometry  
Referee for Journal of Algebra  
Referee for Journal of Pure and Applied Algebra  
Referee for Communications in Algebra  
Referee for Publications IHES  
Referee for National Science Foundation and National Security Agency

### LIST OF COURSES TAUGHT:

**Undergraduate:** Calculus, Algebra, Differential Equations, Mathematical Physics, Topology, Differential Geometry

**Graduate:** Quantum Groups, K-theory, Homological Algebra, Microlocal Analysis, Representations of Lie Groups, Kac-Moody Lie Algebras, D-modules, Higher Algebra, Deformation Theory, Algebraic Geometry, Mirror Symmetry, Moduli Spaces of Curves and Operads, Rigid Analytic Geometry, Mathematical Structures of Quantum Field Theory and String Theory

## CONFERENCES AND LECTURES:

1. International semester in quantum groups and integrable models, St. Petersburg, Russia. October 1990, Invited speaker (1 hour talk)
2. International congress in mathematical physics, Moscow, Russia. 1990, Invited speaker (30 min. talk).
3. International conference, *Geometry and Physics*, Srni, Czechoslovakia. January 1991, Invited speaker (40 min. talk)
4. International semester in *Infinite- dimensional Lie algebras*, Pisa, Italy. April 1991, Invited speaker (1 hour talk)
5. International school *Infinite analysis*, Kyoto, Japan. July-August 1991, Invited speaker (1 hour talk)
6. Mid-Atlantic Algebraic conference, Wake Forest, USA. October 1991, Invited speaker (30 min. talk)
7. Colloquium speaker, Northeastern University, Boston, December 1991
8. Colloquium speaker, Institute Henri Poincare, Paris, February 1992
9. Colloquium speaker, Ecole Normale, Paris, February 1992
10. Colloquium speaker, University Paris VI, Paris, March 1992
11. Colloquium speaker, University of North Carolina, Chapel Hill, April 1992
12. Conference in topology and quantum groups, UC- California at Berkeley. May 1992, Invited speaker (1 hour talk)
13. European School of Group Theory, Enschede, Netherlands. August 1992, Invited lecturer (course of 8 lectures)
14. Meeting of the American Mathematical Society, Dayton, Ohio. October 1992, Invited speaker (30 min. talk)
15. International conference in quantum groups, Bielefeld, Germany. July 1994, Invited speaker (1 hour talk)
16. International conference, *Topology, Strings, and Integrable Systems*, Paris, France. July 1994, Invited speaker (30 min. talk)
17. Colloquium speaker, Kings College, London, 1991
18. Colloquium speaker, University of Liverpool, England, February 1991
19. Colloquium speaker, Mathematical Institute at Warwick University, England, February 1991
20. Colloquium speaker, University of Osaka, Japan, July 1991
21. Colloquium speaker, University of Michigan at Ann Arbor, 1992
22. Colloquium speaker, University of Cincinnati, Ohio, October 1992
23. Colloquium speaker, Kansas State University, 1992
24. Colloquium speaker, Institute for Advanced Study, Princeton, October 1993 and May 1994
25. Colloquium speaker, SUNY at Stony Brook, May 1994
26. Colloquium speaker, Ohio State University, Columbus, 1994
27. Colloquium speaker, University of Oregon, Eugene, 1994
28. Colloquium speaker, University of Iowa, Iowa City, 1995
29. Colloquium speaker, Wichita State University, Wichita, 1995
30. Conference, "Groups and deformations", Ecole Polytechnique, France. May 1996
31. Conference, "Automorphic forms and representation theory", University Paris-7, France. June 1996
32. AMS meeting in Columbia - invited address. October 1996
33. Penn State University Workshop "Quantization" - invited talk. April 1997
34. International workshop in quantum groups, Institute Henri Poincare, Paris. June 1998
35. Colloquium talk at the tri-city (Bern-Strasbourg-Freiburg) algebra seminar, Freiburg. June 1999
36. Colloquium talk at the Max-Planck Institute of Mathematics, Bonn. April 1999
37. Invited talk at Ecole Polytechnique, Paris. January 2000
38. Invited talk at the University Paris-11, Orsay. March 2000
39. Invited talk at the workshop on "Non-commutative geometry", MSRI, Berkeley. February 2000
40. Colloquium talk at the Max-Planck Institute of Mathematics, Bonn. March 2000
41. Invited talk at the workshop on non-commutative geometry, Oberwolfach. March 2000

42. Colloquium talk at the University of Rennes, Rennes. April 2000
  43. Invited talk, Euroconference Moshe Flato, Dijon, September 2000
  44. Invited talk, International conference on non-commutative geometry, Max-Planck Institute, Bonn, September 2000
  45. Arbeitstagung 2003 (MPI), June 2003
  46. Colloquium talk at the University of Oregon, October 2001
  47. International conference Moduli spaces, Lie theory and physics Rome, Italy, 2003
  48. International conference Higher Categories-1,2 Nice (France), September 2001, May 2003
  49. International conference on non-commutative geometry, IHP, Paris, 2003
  50. Workshop on Symplectic geometry, UCLA, May 2003
  51. Colloquium talk at the University of Oklahoma, October 2001
  52. Drinfeld's seminar at the University of Chicago, January 2002
  53. Colloquium talk at the University of Utah, October 2002
  54. Colloquium talk at the University of Toulouse, France, April 2004
  55. International workshop "Journey on quantum groups", IHP, Paris, France, 2001,2003
  56. Colloquium talk at Rutgers University, October 2001
  57. Colloquium talk at the University of Rennes, France, December 2004
  58. Invited talk to the "Strings 2005" workshop at the University of Toronto, February 2005
  59. Invited lecture course "Modern Deformation Theory", University of Copenhagen, Denmark, October 2004
  60. Colloquium talk at the University of Florida, Gainesville, April 2005
  61. Invited lecture course "Mirror Symmetry" at the satellite to Abel Prize conference, Norway, May 2005
  62. Invited talk at the "Non-commutative geometry" workshop at Mittag-Leffler Institute, Sweden, May 2004
  63. Invited lectures "Commutative and non-commutative geometry of mirror symmetry", Vanderbilt University, October 2005
  64. Invited speaker at the workshop "Mathematical questions of String Theory", KITP UC Santa Barbara, November 2005
  64. Invited lectures (including a colloquium talk) at the University of Miami, Florida, February 2006
  65. Colloquium and seminar talk at the University of Toronto and Fields Mathematical Institute, March 2006
  66. Invited talk at the international workshop "Tropical Geometry", American Institute of Mathematics, Palo Alto, April 2006
  67. Colloquium talk at the University of Strasbourg, France, June 2006
  68. Invited lecture at the international workshop "Homological Mirror Symmetry", Vienna, Austria, June 2006
  69. Invited talk at the international conference "Affine Hecke algebras, Matrix Models and Langlands correspondence", CIRM, Luminy, France, July 2006
  70. Invited talk at the international conference "Tropical Geometry and applications", University Paris-6, Paris, France, July 2006
  71. Visiting Fellow and invited participant at the workshop "Non-commutative geometry", Newton Mathematical Institute, Cambridge, UK
- \*Invited speaker to more than 15 regional and national conferences in Russia.

### PROFESSIONAL PUBLICATIONS:

1. *Algebra of functions on the quantized group  $SU(2)$* . Proc. Tambov School in Operator Theory, vol. 1 (1987).
2. *Algebra of functions on the quantized group  $SU(2)$* , parts 1 and 2. Preprints of the Rostov University, Rostov-on-Don, (1986) (joint with L. Vaksman).

3. *Algebra of functions on the quantum group  $SU(2)$* . *Funct. Anal. and Its Appl.*, 22:3,(1988), 1-14 (joint with L. Vaksman).
4. *Algebra of functions on the quantum group  $SU(n)$  and Schubert cells*. *Doklady Acad. Nauk SSSR*, 307:1, (1989), 41-45 (translated in Russian *Doklady*).
5. *Algebra of functions on compact quantum group and its representations*. *Algebra i Analiz.*, 2:1, (1990), 190-212 (translated in *Leningrad Math. Journ.*).
6. *Gelfand-Naimark-Segal states and the Weyl group for the quantum group  $SU(n)$* . *Funct. Anal. and Its Appl.* 24:3, (1990).
7. *Quantum group  $SU(n)$  and odd-dimensional quantum spheres*. *Algebra i Analiz*, 2:5, (1990) (joint with L. Vaksman)(translated in *Leningrad Math. Journ.*).
8. *Rank of quantized universal enveloping algebras and modular functions*. *Commun. in Math. Phys.*, 137:2, (1991) (joint with S. Majid).
9. *Chern-Simons theory, modular functions and quantum mechanics in an alcove*. *Int. Journ. Mod. Phys. A*, 6:10, (1991) (joint with S. Majid).
10. *Quantum Weyl group and some of its applications*. *Suppl. Rend. Circ. Mat. Palermo*, 26:2, (1991).
11. *Some applications of the quantum Weyl group*. *Journ. Geom. and Phys.* 7:2, (1990) (joint with S. Levendorskii).
12. *Quantum Weyl group and multiplicative formula for the universal quantum  $R$ -matrix*. *Funct. Anal. and Its Appl.*, 25:1, (1991) (with S. Levendorskii).
13. *Some problems in quantum groups*. *Adv. in Soviet Math.*, vol. 9 (ed. A. Vershik), (1992) (joint with L. Vaksman).
14. *Algebras of functions on compact quantum groups, Schubert cells and quantum tori*. *Commun. in Math. Phys.*, 139:1,(1991) (joint with S. Levendorskii).
15. *Quantum group  $A^\infty$* . *Commun. in Math. Phys.*, 141:2, (1991) (joint with S. Levendorskii).
16. *Algebras of functions on the compact quantum groups and their representations*. *Proc. Int. Semester in Quantum Groups*, Leningrad, (1991).
17. *On quantum flag manifold*. Preprint RIMS Kyoto University, n.780, (1991). Published in *Funct. Anal. and Appl.*, 26:3, 90-92 (1992).
18. *Irreducible representations of the quantized function algebras and Schubert cells*. *Proc. Voronezh School*, prepr. VINITI USSR, (1989).
19. *Bicrossproduct structure of the quantum Weyl group*. Preprint DAMTP Cambridge University, 91-15,(1991), and *Journ. of Algebra* 163:1 (1994) (joint with S. Majid).
20. *Remark of the representations of braid group arising from the quantum Weyl group*. Preprint DAMTP Cambridge University, 91-06,(1991).
21. *Selected topics in quantum groups*. Joint preprints of DAMTP Cambridge University, 91-28 and RIMS Kyoto University n.804, (1991). Published in *Infinite Analysis*, vol. 1(1992). World Scientific.
22. *Quantum Weyl group and universal quantum  $R$ -matrix for affine Lie algebra  $A$* . Preprint IHES, (February 1992). Published in *Lett. Math. Phys.*, vol. 27, 253-264 (1993) (with S. Levendorskii and V. Stukopin).
23. *Method of matched asymptotic expansions in the plane condenser problem*. Preprint VINITI USSR, 4068-80, (1980).
24. *On the asymptotics of the capacity of the condenser with arbitrary plates*. *Doklady AN SSSR*, 258:3, (1981) (translated in Russian *Doklady*).
25. *Asymptotics of the solution of one non-standard variational problem*. *Izvestia Severo-Kavkazskogo Centra Vyshei Schkoly*, n.4, (1981).
26. *Contribution to the problem by Polya and Szege of the disk condenser capacity*. Preprint VINITI USSR, 2208-81, (1981).
27. *On the asymptotics of the condenser capacity*. Preprint VINITI USSR, 2281-81, (1981).
28. *Algebraic aspects of the methods giving matched asymptotics*. Preprint VINITI USSR, 1698-84, (1984).
29. *On the formalism of the method of matched asymptotic expansions*. Preprint VINITI USSR, 1700-84, (1984).
30. *Asymptotical formula for the capacity of the condenser with dielectric slab*. Preprint VINITI USSR, 1699-84, (1984).
31. *Asymptotical formula for the potential in the domain with thin non-smooth inclusion*. Preprint VINITI USSR, 4087-83, (1983).

32. *Asymptotical formula for the condenser with the plates of an arbitrary shape.* Siberian Math. Journ., n.6, (1984).
33. *On the computing of the electrical capacity.* Izvestia vuzov, ser. Elektromekhanika, n.11, (1987) (joint with I. Simonenko).
34. *Horisontal rays and vertical parabolic equations in the problem of the sound propagation of the moving saucer.* Math. methods in appl. acoustics, Rostov-on-Don, (1990) (joint with A. Olifer).
35. *On  $K$ -groups of the cospherical bundle over 2-dimensional manifolds.* Preprint Rostov University, Rostov-on-Don, (1979).
36. *Topological invariant related to the decomposition of solids to the pieces of the smaller diameter.* Matem. Zametki, n.4, (1980) (translated in Russian Math. Zametki).
37. *Representations of algebras of functions on quantum groups at root of unity, 2-categories and Zamolodchikov tetrahedra equation,* (joint with D. Kazhdan). The Gelfand Mathematical Seminars, (1990-1992). Birkhauser (1993), 163-171.
38. *Method of orbits for the algebras of functions on quantum groups and coherent states I,* Duke J. Math., (Int. Math. Res. notes), n.6 (1993), 151-163.
39. *Asymptotic of a condenser capacity and invariants of Riemannian submanifolds.* Preprint of the Max-Planck Institute für Mathematics in Bonn, (1994).
40. *Quantum affine algebras and their representations,* (with D. Kazhdan). J. of Pure and Appl. Alg. 100 (1995), 217-224.
41. *Representations of quantum affine algebras,* (with D. Kazhdan). Selecta Mathematica (New series), 1:3 (1995), 537-595.
42. *Representations of quantum affine algebras.* Proceedings Conf. Topology and Strings, Paris, 1994.
43. *Asymptotic of the condenser capacity and invariants of submanifolds in  $\mathbb{R}^n$ ,* in Comptes Rend. Acad. Sci., Paris., Ser. I (1996), 507-510.
44. *Asymptotics of a condenser capacity and invariants of Riemannian submanifolds,* Selecta Math., 2:4 (1996), 653-667.
45. *Meromorphic tensor categories,* q-alg. 9709030. Published in Contemporary Math. 248 (1999), 437-451.
46. *Meromorphic braided category arising in quantum affine algebras.* Preprint MPI (29), 1999. Published in IMRN, vol. 19 (1999), 1067-1079.
47. *Deformations of algebras over operads and Deligne's conjecture (with M. Kontsevich),* arXiv:math.QA/0001151. Published in Math. Phys. Stud. vol 21, 255-307.
48. *Homological mirror symmetry and torus fibrations (with M. Kontsevich),* in "Symplectic Geometry and String Theory", Proc. KIAS conference, Seoul, 2001.
49. *Non-commutative compactifications and elliptic curves (with V. Vologodsky),* IMRN, no.28, 2003, 1549-1569.
50. *Homological Mirror Symmetry, deformation quantization and non-commutative geometry (with P. Bressler),* to appear in J. Math. Phys.
51. *Mirror Symmetry and Deformation Theory,* J. Math. Phys., 2005
52. *Quantum tori, mirror symmetry and deformation quantization,* math.QA/0011162 and Lett. Math. Phys. v. 62, 2001.
53. *Integral affine structures and non-archimedean analytic spaces (with M. Kontsevich),* math.AG/0406564, published in Gelfand' "Unity of Mathematics" volume, 2005.
53. *On non-commutative analytic spaces over non-archimedean fields ,* preprint IHES, M/05/33, 2005, math.QA/0606001, submitted.
54. *Notes on A-infinity algebras, A-infinity categories and non-commutative geometry. I (with M. Kontsevich),* math.RA/0606241, submitted.

### Monograph

1. *Algebras of functions on quantum groups I.* AMS.1998.