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Curriculum Vitae

Victor Kac

Born: December 19, 1943, Buguruslan, Russia
Citizenship: U.S.A.
Education: B.S. Moscow State University, 1965
PhD Moscow State University, 1968
Thesis: Simple Irreducible Graded Lie Algebras of Finite Growth

Positions Held:

Assistant, 1968–1971
Moscow Institute of Electronic Machine Building

Senior Teacher, 1971–1976
Moscow Institute of Electronic Machine Building

Visiting Associate Professor, 1977
M.I.T., Cambridge, MA 02139, U.S.A.

Associate Professor, 1978–1980
M.I.T., Cambridge, MA 02139, U.S.A.

Professor, 1981–present
M.I.T., Cambridge, MA 02139, U.S.A.

Honors and Awards:

1981–1983	Sloan Fellowship
1981	Medal from the College de France
1986–87	Guggenheim Fellowship
1994	Wigner Medal
1998	Honorary member of Moscow Math. Society
1998	Chaire Condorcet at Ecole Normale Superieure, Paris
1999	Sackler fellow, IHES
2002	Simons research visiting professor, MSRI
2003	Sarojini Damadaran fellow, TIFR
2007	Member of the American Academy of Arts and Sciences
2008	Conference on 65th birthday, Cortona, Italy
2012	IHP fellowship
2012-13	Simons Fellowship
2013	Member of the National Academy of Sciences, USA
2013	Conference on 70th birthday, Rio de Janeiro
2013	Victor Kac afternoon, IHES
2015	Steele prize for life achievement
2019-20	Simons Fellowship
2019	Sackler American fellow, IHES
2019	Foreign member of the Accademia dei Lincei
2023	Conference on 80th birthday, Rome
2024	Highly ranked scholar by ScholarGPS

Conferences organized:

Oberwolfach, Germany, 1980 and 1985
Marseille, Lumini, France, 1988
Pisa, Italy, Spring program, Infinite dimensional algebra and algebraic geometry, 1991
M.I.T., Lie theory and geometry, 1993
ESI, Vienna, Programm on representation theory, 2000
Toronto, Fields Institute, 2000
MSRI, Programm Infinite-dimensional algebras and Mathematical Physics, 2002
BIRS, working in teams programm, August 2003
ESI, Vienna, Summer school on vertex algebras, June 2005
BIRS, Focused research group, May 2006
IUM, Moscow, Transformation groups, December 2007
MSU, Moscow, Algebraic methods in integrable systems, December 2012
Centro Di Georgi, Pisa, Intensive period in Lie theory, December 2014- January 2015
ESI, Vienna, Programm on geometric representation theory, January 2017

Editorial boards and scientific committees:

Advanced series in Mathematical Physics, World Scientific, Singapore
Reviews in Mathematical Physics, World Scientific, Singapore
Transformation groups, Birkhäuser, Boston
Journal of Algebra and Applications, World Scientific
Advisory committee of INDAM, Rome
Advisory board of Istanbul Center for Mathematical Sciences

Selected invited addresses and lecture series:

Harvard colloqium, 1977
ICM, Helsinki, 1978
Invariant theory, Bonn, 1979
AMS annual meeting, San Antonio, Texas, 1980
Australian National University colloqium, Canberra, 1980
College de France, lecture series, 1981
Montacatini Terme, lecture series, Italy, 1982
Universite Paris 6, lecture series, 1983
Mathematical Soc of Denmark, Copenhagen, 1983
RIMS colloquium, Kyoto, 1984
The mathematical heritage of E. Cartan, Lyon, 1984
Anomalies, geometry, toplogy, Argonne, 1985
Academia Sinica, Beijing, lecture series, 1985
TIFR, Bombay, lecture series, 1985-86
Algebraic groups, Utrecht, 1987
Strings 88, Maryland, 1988
Centennial of the AMS, Providence, 1988
Colloque Dixmier, Paris, 1989
Group theoretical methods in physics, Moscow, 1990
LOMI colloquium, Leningrad, 1990
Charles University colloquium, Prague, 1990

SNS, Pisa, lecture series, 1991
Colloque Bruhat-Tits, Paris, 1991
Lezioni Leonardesche, Milan, 1991
Theoretical physics conference, Tbilisi, lecture series, 1991
Canadian Math Soc, 1991
Ecole Normale, Paris , lecture series, 1992-93
University of Amsterdam colloquium, 1993
Amici della SNS di Pisa, lecture series, 1994
Cordoba and Mendoza, lecture series, 1994
Ecole Normale, Lyon, lecture series, 1995
Quantum field theory, Dubna, Russia, 1996
Group theoretical methods in physics, Goslar, Germany, 1996
Kyoto University, lecture series, 1996
Lumini, CIRM lecture series, 1997
Frontiers in mathematics lecture series, Texas A+M University, 1997
International Congress in Math. Physics, Brisbane, Australia, 1997
Rome University graduate course, 1997
Soliton theory and geometry, Moscow, 1998
Schroedinger institute, lecture series, Vienna, 1998
Ecole Normale, Paris, lecture course, 1998
Rome University colloquium, 1998
Swedish Math. Soc, Stockholm, 1999
Visions in mathematics, Tel-Aviv, 1999
Yale University colloquium, 2000
Weisfeiler lecture, 2000
Colloquio latinoamericano, La Falda, Argentina, 2001
ICM Beijing, Plenary address, 2002
Graduate course in Beijing University, 2002
TIFR, Mumbay, lecture series, 2003
Giornata INDAM, Rome University 1, 2004
Group theoretical methods in physics, Cocoyoc, Mexico, 2004
Algebra day, Carleton University, 2004
Distinguished lecturer series, Weizmann Institute, 2005
Summer school in Bad Honnef, 2005
British Math. Colloquium, Newcastle, 2006
Escola de Altos Estudos course of lectures, Sao Paulo, Brasil, 2007
Lie days lecture series, Cornell University, 2007
Rome University 2 colloquium, 2008
Graduate course in Rome University 1, 2008-09
Knowledge transfer lecture, Edinburgh, 2009
Centennial of J. Racah, Jerusalem, 2010
Lecture course in Buenos Aires University, 2010
Seminal interactions between mathematics and physics, Rome, 2010
Lecture course in Tsinghua University, Beijing, summer 2011
IMPA 60 lecture, October 2012
Hadamard lectures, IHES, November 2012
Solstice conference, Paris, June 2013
Mathematics and quantum physics conference, Rome, July 2013

Lecture course in Centro di Giorgi, Pisa, December 2014-January 2015
Lecture course in Max Planck Institute, Bonn, March 2015
Levi-Civita colloquium, Rome Tor Vergata, January 2016
Mathematics and Physics at crossroads, Frascatti, July 2016
Symmetries and differential equations, Istanbul, August 2017
Vertex algebras, Rome, December 2017
Group theoretical methods in physics, Prague, July 2018
Kac-Moody geometry, Besse, France, May 2019
Vertex algebras, Dubrovnik, June 2019
Integrable systems, Bologna, January, 2020
Winter school, Daibretes Switserland, February 2020
Lie superalgebras, Israel, March 2021
Representation theory, Israel, December 2022
Where mathematics meets quantum physics, Rome, June 2023
Vertex algebras, Dubrovnik, June 2023
Ukrainian conference in algebra, Sumy, July 2023
W-algebras, Edinburgh, August 2023
Representations of Lie supergtoups, Bonn, July 2024

Books:

1. *Infinite dimensional Lie algebras*, Birkhäuser, Boston, 1983 (second edition, Cambridge University Press, 1985) (third edition, Cambridge University Press, 1990). Russian translation, MIR, Moscow, 1993. Chinese translation, 2006.
2. *Infinite dimensional groups with applications*, ed., Publ. MSRI 4, 1985.
3. (with A. Raina)*Bombay lectures on highest weight representations*, World Scientific, 1987.
4. (with A. Raina and N. Rozhkovskaya)*Bombay lectures on highest weight representations*, Second edition, World Scientific, 2013.
5. *Infinite-dimensional Lie algebras and groups*, ed., *Adv. Ser. in Math. Phys.*, vol. 7, 1989.
6. (with V. Guillemin, J.-L. Brylinsky and R. Brylinsky) *Lie theory and geometry*, ed., Birkhäuser, Boston, 1994.
7. *Vertex algebras for beginners*, University lecture series, AMS, vol. 10, 1996 (second edition, AMS, 1998). Russian translation, Moscow 2005.
8. (with C. Martinez and E. Zelmanov) Graded simple Jordan superalgebras of growth one, Memoirs of AMS 711, 2001, pp 1-140.
9. (with P. Cheung)*Quantum calculus*, Springer-Verlag, 2002. Russian translation, Moscow 2005. Persian translation, 2015.
10. (with R. Kellerhals, F. Knop, P. Littelman, D. Panyushev) *Vinberg volume*, ed., J. Algebra **313**, Springer-Verlag, 2007.
11. (with R. Panyushev, E. Vinberg) *Morozov volume*, ed., Transf. Groups **15**, Springer-Verlag, 2010.
12. (with S. Gindikin, E. Vinberg) *Dynkin volume*, ed., Transf. Groups **19**, Springer-Verlag, 2014.
13. (with V. Popov) *Lie groups, geometry and representation theory. Kostant memorial volume*, ed., Progress in Math **326**, Springer-Verlag, 2018.

Publications

1. On a characteristic property of locally Euclidean spaces, *Uspehi Mat. Nauk.* **191** (1964), No. 4, 225–227.
2. (with E. Vinberg) Quasi-homogeneous cones, *Math. Zametiki* **1** (1967), 347–354 (English translation: *Math. Notes* **1** (1967)).
3. Simple graded Lie algebras of finite growth, *Funkt. Analys y eĝo prilozh.* **1** (1967), No. 4, 82–83 (English translation: *Funct. Anal. Appl.* **1** (1967), 328–329).
4. Graded Lie algebras and symmetric spaces, *Funkt. Analys y eĝo prilozh.* **2** (1968), No. 2, 93–94 (English translation: *Funct. Anal. Appl.* **2** (1968), 183–184).
5. Simple irreducible graded Lie algebras of finite growth, *Iz vestija AN USSR (ser. Math.)* **32** (1968), 1923–1967 (English translation: *Math. of USSR-Izvestija* **2** (1968), 1271–1311).
6. Some properties of the contragredient Lie algebras, *Trudy MIEM*, No. 5, 1969, 48–60.
7. An algebraic definition of compact Lie groups, *Trudy MIEM*, No. 5, 1969, 36–47.
8. Automoprhisms of finite order of semi-simple Lie algebras, *Funkt. analys y eĝo prilozh.* **3** (1969), No. 3, 94–96 (English translation: *Funct. Anal. Appl.* **3** (1969), 252–254).
9. On classifications of simple Lie algebras over fields of non-zero characteristics, *Izvestija AN USSR (ser. Math.)* **34** (1970), 381–404 (English translation: *Math of USSR-Izvestija* **4** (1970), 391–413).
10. (with B. Weisfeiler) Exponentials in Lie algebras of characteristic p, *Izvestija AN USSR (ser. Math.)* **35** (1971), 762–788 (English translation: *USSR-Izvestija* **5** (1971), 777–803).
11. (with B. Weisfeiler) On irreducible representations of Lie p-algebras, *Funkt. analys y eĝo prilozh.* **5** (1971), No. 2, 28–36 (English translation: *Funct. Anal. Appl.* **5** (1971), 111–117).
12. Global Cartan pseudogroups and simple Lie algebras of characteristic p, *Uspehi Math. Nauk.* **26** (1971), No. 3, 199–200.
13. On algebras related to quantum field theory, *All-Union Algebraic Colloquium*, Kishinev, 1971, 140–141.
14. On irreducible representations of Lie algebras of classical type, *Uspehi Math. Nauk.* **27** (1972), No. 5, 237–238.
15. Filtered Lie algebras of Cartan type, *Uspehi Math. Nauk.* **29** (1974), No. 3, 203–204.
16. Infinite-dimensional Lie algebras and the Dedekind η-function, *Funkt. analys y eĝo prilozh.* **8** (1974), No. 1, 77–78 (English translation: *Funct. Anal. Appl.* **8** (1974), 68–70).
17. A description of filtered Lie algebras whose associated graded Lie algebras are of Cartan type, *Izvestija AN USSR (ser. Math.)* **38** (1974), 800–834 (English translation: *Math. of USSR-Izvestija* **8** (1974), 801–835; letter to the editor, 40 (1976), No. 6).
18. On the question of description of the orbit space of linear algebraic groups, *Uspehi Math. Nauk.* **30** (1975), No. 6, 173–174.
19. Classification of simple Lie superalgebras, *Funct. Anal. y ego Prilozh.* **9** (1975), No. 3, 91–92; letter to the editor, **10** (1976), No. 2, **93** (English translation: *Funct. Anal. Appl.* **9** (1975), 263–265).

20. (with B. Weisfeiler) Coadjoint action of a semi-simple algebraic group and the center of the enveloping algebra in characteristic p, *Proc. Kon. Nederl. Akad., Series A* **38** (1976), 136–151.
21. (with V. Popov and E. Vinberg) Sur les groupes linear algebrique avec algebres d'invariants libre, *C.R. Acad. Sci. Paris*, **283** (1976), 875–878.
22. A sketch of Lie superalgebra theory, *Comm. Math. Physics* **53** (1977), 31–64.
23. Characters of typical representations of classical Lie superalgebras, *Comm. in Algebra* **5**, No. 8 (1977), 889–897.
24. Classification of simple Z-graded Lie superalgebras and simple Jordan superalgebras, *Comm. in Algebra* **5**, No. 13 (1977), 1375–1400.
25. Lie superalgebras, *Advances in Math.* **26**, No. 1 (1977), 8–96.
26. Classification of simple algebraic supergroups, *Uspehi Math. Nauk.* **32**, No. 3 (1977), 214–215.
27. Infinite-dimensional algebras, Dedkind's η-function, classical Möbius function and the very strange formula, *Advances in Math.* **30** (1978), 85–136.
28. (with E. Vinberg) Spinors of 13-dimensional space, *Advances in Math.* **30** (1978), 137–155.
29. Representations of classical Lie superalgebras, *Lecture Notes in Math.* **676** (1978), 597–626.
30. Contravariant form for infinite dimensional Lie algebras and superalgebras, *Lecture Notes in Physics* **94** (1979), 441–445).
31. (with D. Kazhdan) Structure of representations with highest weight of infinite dimensional Lie algebras, *Advances in Math.* **34** (1979), 97–108.
32. Highest weight representations of infinite dimensional Lie algebras, *Proceedings of ICM, Helsinki* **1978** (1980), 299–304.
33. Infinite root systems, representations of graphs and invariant theory, *Inventiones Math.* **56** (1980), 57–92.
34. An elucidation of "Infinite dimensional algebras... and the very strange formula" $E_8^{(1)}$ and the cube root of the modular invariant j, *Advances in Math.* **35** (1980), 264–273.
35. On simplicity of certain infinite-dimensional Lie algebras, *Bul. Amer. Math. Soc.* **2** (1980) 311–314.
36. Some remarks on nilpotent orbits, *Journal of Algebra* **64** (1980) 190–213.
37. (with D. Peterson) Affine Lie algebras and Hecke modular forms, *Bull. Amer. Math. Soc.* **3** (1980) 1057–1061.
38. A remark on the Conway-Norton conjecture about the "Monster" simple group, *Proc. Nat'l. Acad. Sci. USA*, **77** (1980) 5048–5049.
39. (with I. Frenkel) Basic representations of affine Lie algebras and dual resonance models, *Invent. Math.* **62** (1980) 23–66.
40. Some remarks on representations of quivers and infinite root systems, *Lecture Notes in Math.* **832** (1980), 311–327.
41. (with D. Kazhdan, J. Lepowsky and R. Wilson) Realization of the basic representation of the Euclidean Lie algebras, *Advances in Math.* **42** (1981), 83–112.

42. Simple Lie groups and the Legendre symbol, *Lecture Notes in Math.* **848** (1981), 110–124.
43. (with D. Peterson) Spin and wedge representations of infinite dimensional Lie algebras and groups, *Proc. Nat'l. Acad. Sci. USA* **78** (1981), 3308–3312.
44. (with O. Gabber) On defining relations of certain infinite-dimensional Lie algebras, *Bull. Amer. Math. Soc.* **5** (1981), 185–189.
45. (with K. Watanabe) Finite linear groups whose ring of invariants is a complete intersection, *Bull. Amer. Math. Soc.* **6** (1982), 221–223.
46. (with V. Deodhar and O. Gabber) Structure of some categories of representations of infinite dimensional Lie algebras, *Advances in Math.* **45** (1982), 92–116.
47. Infinite root systems, representations of graphs and invariant theory II, *Journal of Algebra* **78** (1982), 141–162.
48. Some problems on infinite dimensional Lie algebras and their representations, *Lecture Notes in Math.* **933** (1982), 117–126.
49. (with D. Peterson) Infinite flag varieties and conjugacy theorems, *Proc. Nat. Acad. Sci. USA* **80** (1983), 1778–1782.
50. Montecatini lectures on invariant theory, *Lecture Notes in Math.* **996** (1983), 74–108.
51. (with D. Peterson) Regular functions on certain infinite-dimensional groups, Arithmetic and Geometry (ed. M. Artin and J. Tate), *Progress in Math.* **36**, Birkhäuser, Boston, 141–166, 1983.
52. Infinite-dimensional Lie algebras, *Progress in Math.* **44**, Birkhäuser, Boston, 1983.
53. (with D. Peterson) Infinite dimensional Lie algebras, theta functions and modular forms, *Advances in Math.* **53** (1984), 125–264.
54. (with D. Peterson) Unitary structure in representation of infinite-dimensional groups and a convexity theorem, *Invent. Math.* **76** (1984), 1–14.
55. Laplace operators of infinite-dimensional Lie algebras and theta functions, *Proc. Nat'l. Acad. Sci. USA* **81** (1984), 645–647.
56. (with J. Dadok) Polar representations, *J. Algebra* **92** (1985), 504–524.
57. Infinite dimensional Lie algebras, second edition, Cambridge University Press, 1985.
58. Torsion in cohomology of compact Lie groups and Chow rings of reductive algebraic groups, *Invent. Math.* **80** (1985), 69–79.
59. (with H. Jakobsen) A new class of unitarizable highest weight representations of infinite-dimensional Lie algebras, *Lecture Notes in Physics* **226** (1985), 1–20.
60. Constructing groups associated to infinite-dimensional Lie algebras, Proceedings of the conference on Infinite-dimensional groups, Berkeley 1984, MSRI publ. #4, 1985, 167–216.
61. (with D. Peterson), Defining relations of certain infinite-dimensional groups, Proceedings of the Cartan conference, Lyon 1984, Asterisque, 1985, Numero hors serie, 165–208.
62. (with D. Peterson) Generalized invariants of groups generated by reflections, in Proceedings of the Conference Giornate di Geometria, Rome 1984. *Progress in Math.* **60**, Birkhäuser, 1985, 231–250.
63. (with D. Peterson) 112 Constructions of the basic representation of the loop group of E_8, Proceedings of the conference "Anomalies, geometry, topology," Argonne, 1985. World Scientific, 1985, 276–298.

64. (with I.T. Todorov) Superconformal current algebras and their unitary representations, *Comm. Math. Physics* **102** (1985), 337–347.
65. (with M. Wakimoto) Unitarizable highest weight representations of the Virasoro, Neveu-Schwarz and Ramond algebras, in Proceedings of the Symposium on conformal groups and structures, Claustal, 1985. *Lecture Notes in Physics* **261** (1986), 345–372.
66. (with D. Peterson), Lectures on the infinite wedge representation and the MKP hierarchy, *Seminaire de Math. Superieures*, Les Presses de L'Université de Montréal **102** (1986), 141–186.
67. Highest weight representations of conformal current algebras, Symposium on Topological and Geometric methods in Field theory, Espoo, Finland, 1986. World Scientific (1986), 3–16.
68. (with D. Peterson) On geometric invariant theory for infinite-dimensional groups, in *Lecture Notes in Math.* **1271**, 102–142, 1987.
69. (with J. Van de Leur) Super boson-fermion correspondence, *Ann. de L'Institute Fourier* **37** (1987), 99–137.
70. (with A. Raina) Bombay lectures on highest weight representations of infinite-dimenonal Lie algebras, World Scientific, 1987.
71. (with M. Wakimoto) Modular and conformal invariance constraints in representation theory of affine algebras, *Advances in Math.* **70** (1988), 156–234.
72. (with E. Arbarello, C. De Concini and C. Procesi) Moduli spaces and curves and representation theory, *Comm. in Math. Phys.* **117** (1988), 1–36.
73. (with M. Niculescu-Sanielevici) Decomposition of representations of exceptional affine algebras with respect to conformal subalgebras, *Phys. Rev. D* **37** (1988), 2231–2237.
74. (with M. Wakimoto) Modular invariant representations of infinite dimensional Lie algebras and superalgebras, *Proc. Nat'l. Acad. Sci. USA* **85** (1988), 4956–4960.
75. (with R. Moody and M. Wakimoto) On E_{10}, Proceedings of the 1987 conference on differential-geometrical methods in physics, Kluwer, 1988, 102–128.
76. (with H. Jakobsen) A new class of unitarizable highest weight representations of infinite-dimensional Lie algebras II, *J. Funct. Anal.* **82** (1989), 69–90.
77. (with M. Wakimoto) Exceptional hierarchies of soliton equations, *Proceedings of Symposia in Pure Math.* **49** (1989), 191–237.
78. (with E. Arbarello and C. De Concini) The infinite wedge representation and the reciprocity law for algebraic curves, *Proceedings of Symposia in Pure Math.* **49** (1989), 171–190.
79. (with C. De Concini and D. Kazhdan) Boson-fermion correspondence over $\mathbb{Z}$, in Infinite-dimensional Lie algebras and groups, *Adv. Ser. Math. Phys.* **7** (1989), 124–137.
80. (with J. van de Leur) Super boson-fermion correspondence of type B, in *Infinite dimensional Lie algebras and groups, Adv. Ser. Math. Phys.* **7**, World Scientific, 369–406, 1989.
81. (with J. van de Leur) On classification of superconformal algebras, in *Strings 88*, World Scientific, 77–106, 1989.
82. (with M. Wakimoto) Classifications of modular invariant representations of affine algebras, in Infinite dimensional Lie algebras and groups, *Adv. Ser. Math. Phys.* **7**, World Scientific, 138–177, 1989.

83. (with C. De Concini) Representation of quantum groups at roots of 1, Colloque Dixmier, 1990, *Progress in Math.* **92**, Birkhäuser, 1990, 471–506.

84. Infinite dimensional Lie algebras, third edition, Cambridge University Press, 1990.

85. (with M. Wakimoto) Branching functions for winding subalgebras and tensor products, *Acta Applicandae Math.* **21** (1990), 3–39.

86. (with A.S. Schwarz) Geometric interpretation of partition function of 2D quantum gravity, *Phys. Lett. B* **257** (1991), 329–334.

87. (with C. De Concini) Representations of quantum groups at roots of 1: reduction to the exceptional case, in *Adv. Series in Math. Phys.* **16A** (1992), 141–150.

88. Modular invariance in mathematics and physics, AMS Centennial Publications II, Mathematics into the 21st century, 1992, 337–350.

89. (S.-P. Wang) On automorphisms of Kac-Moody algebras and groups, *Advances in Math.* **92** (1992), 129–195.

90. (with C. De Concini and C. Procesi) Quantum coadjoint action, *AMS Math. Journal* **5** (1992), 151–190.

91. (with E. Frenkel and M. Wakimoto) Characters and fusion rules for W-algebras via quantized Drinfeld-Sokolov reduction, Comm. in Math. Phys., **147** (1992), 295–328.

92. (with C. De Concini and C. Procesi) Some remarkable degenerations of quantum groups, *Comm. Math. Phys.* **157** (1993), 405–427. hep-th/9308138

93. (with J. van de Leur) The n-component KP hierarchy and representation theory, in *Important developments in soliton theory*, pp. 302–343, eds. A.S. Fokas and V.E. Zakharov, Springer-Verlag, 1993.

94. (with A. Radul) Quasifinite highest weight modules over the Lie algebra of differential operators on the circle, *Comm. Math. Phys.* **157** (1993), 429–457. hep-th/9308153

95. (with M. Wakimoto) A construction of generalized spin models, in *Perspectives in Math. Physics*, Conference Proceedings, Vol. 3, International Press, 1994, 125–150.

96. (with W. Wang) Vertex operator superalgebras and their representations, *Contemporary Mathematics* **175** (1994), 161–191. hep-th/9312065

97. (with M. Wakimoto) Integrable highest weight modules over affine superalgebras and number theory, *Progress in Math.* **123** (1994), 415–456. hep-th/9407057

98. (with C. De Concini and C. Procesi) Some quantum analogues of solvable Lie groups, Proceedings of the International Colloquium on Geometry and Analysis, Bombay 1992, Oxford University Press, 1995, 41–66. hep-th/9308138

99. (with A. Radul) Poisson structure in restricted Lie algebras, The Gelfand Mathematical Seminars,1996-1999, Birkhause, Boston, 1999, 77–84.

100. (with E. Frenkel, A. Radul and W. Wang) $\mathcal{W}_{1+\infty}$ and $\mathcal{W}(gl_N)$ at central charge N, *Comm. Math. Phys.* **170** (1995) 337–358. hep-th/9405121

101. (with S.-J. Kang) Trace formula for graded Lie algebras and monstrous moonshine, Canadian Math.Soc.conference proceedings 16 (1995),141-154.

102. (with J. Beck) Finite-dimensional representations of quantum affine algebas at roots of 1, *AMS Math. Journal* **9** (1996),391-423. hep-th/9410189

103. (with E. Medina) On the SKP hierarchy,*Lett.Math.Phys.* **37** (1996), 435-448.

104. (with A. Radul) Representation theory of the vertex algebra $W_{1+\infty}$, *Transformation groups* **1** (1996), 41-70. hep-th/9512150

105. (with I. Todorov) Affine orbifolds and RCFT extensions of $W_{1+\infty}$, *Comm. Math.Phys.*, **190** (1997), 57-111. hep-th/9612078

106. (with S.-J. Cheng) A new $N = 6$ superconformal algebra, *Comm. Math. Phys.*, **186** (1997), 219-231.

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109. (with S.-J. Cheng) Conformal modules, *Asian J. Math.* **1** (1997), 181-193. Erratum, 2(1998),153-156. q-alg/9706030

110. (with J. van de Leur) The geometry of spinors and the multicomponent BKP and DKP hierarchies, *CRM Proceedings and Lecture Notes***14** (1998), 159-202. solv-int/9706006

111. (with S.-J. Cheng and M. Wakimoto) Extensions of conformal modules, in *Topological field theory, primitive forms and related topics*, Proceedings of Taniguchi and RIMS symposia, Progress in Math. **160**, Birkhäuser , 1998, pp 79-130. q-alg/9709019

112. Formal distribution algebras and conformal algebras, in Proceedings of the 12th International Congress in Math. Physics, 1997, De Witt et al eds, International Press, Boston, 1999, pp 80-97. q-alg/9709027

113. (with A. D'Andrea) Structure theory of finite conformal algebras, *Selecta Math.*, **4** (1998), 377-418.

114. (with M. Golenishcheva-Kutuzova) Γ-conformal algebras, *J. Math Physics* **39** (1998), 2290-2305. q-alg/9709006

115. (with C. Boyallian, J. Liberati and C. Yan) Quasifinite highest weight modules over the Lie algebra of matrix differential operators on the circle, *J. Math Physcis*, **39** (1998), 2910–2928.

116. (with W. Wang and C. Yan) Quasifinite representations of classical Lie subalgebras of $W_{1+\infty}$, *Advances in Math*, **139** (1998), 56-140. QA/9801136

117. Classification of infinite-dimensional simple linearly compact Lie superalgebras, *Adv. in Math.*, **139** (1998), 1-55. ESI preprint no 406 ,1998.

118. (with B. Bakalov and A. Voronov) Cohomology of conformal algebras, *Comm. Math. Phys.***200** (1999), 561-598. math.QA/9803022

119. (with S.-J. Cheng) Generalized Spencer cohomology and filtered deformations of $\mathbb{Z}$-graded Lie superalgebras, *Advances in Theor. and Math. Physics*, **2** (1998), 1139-1180. math.RT/9805039

120. (with S.-J. Cheng) Structure of some $\mathbb{Z}$-graded Lie superalgebras of vector fields, *Transformation groups*, **4** (1999), 219-272. Erratum, 9(2004), 399-400.

121. (with A. Smilga) Vacuum structure in supersymmetric Yang-Mills theories with any gauge group, in: The many faces of the Superworld, Golfand memorial volume, M. Shifman, ed, World sci., 2000, pp 185-234 . hep-th/9902029

122. (with A. Smilga) Normalized vacuum states in N=4 supersymmetric Yang-Mills quantum mechanics with any gauge group, Nuclear Physics **B571** (2000),515-554. hep-th/9908096

123. (with S.-J. Cheng and M. Wakimoto) Extensions of Neveu-Schwarz conformal modules, J. Math. Physics **41** (2000), 2271-2294.

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