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[2] <i>Liu Yi-Cheng, I.T. Todorov</i> : Singularities of some Feynman graphs, Nucl. Phys. 50 (1964) 273-280.....	32
[3] <i>D.Tz. Stoyanov, I.T. Todorov</i> : Majorana representations of the Lorentz group and infinite-component fields, J. Math. Phys. 9 (1968) 2146-2167. ....	40
[4] <i>A.I. Oksak, I.T. Todorov</i> : Invalidity of TCP-theorem for infinite-component fields, Commun. Math. Phys. 11 (1968) 125-130. ....	62
[5] <i>A.I. Oksak, I.T. Todorov</i> : Degeneracy of the mass spectrum for infinite-component fields, Phys. Rev. D1 (1970) 3511-3513. ....	68
[6] <i>C. Itzykson, V.G. Kadyshevsky, I.T. Todorov</i> : Three-dimensional formulation of the relativistic two-body problem and infinite-component wave equations, Phys. Rev. D1 (1970) 2823-2831.....	71
[7] <i>G. Mack, I.T. Todorov</i> : Conformal invariant Green functions without ultraviolet divergencies, Phys. Rev. D8 (1973) 1764-1787. ....	80
[8] <i>V. Dobrev, G. Mack, V. Petkova, S. Petrova, I. Todorov</i> : On the Clebsch-Gordan expansion for the Lorentz group in $n$ dimensions, Rep. Math. Phys. 9 (1976) 219-246. ....	104
[9] <i>V. Bargmann, I.T. Todorov</i> : Spaces of analytic functions on a complex cone as carriers of for the symmetric tensor representations of $SO(n)$ , J. Math. Phys. 18 (1977) 1141-1148...	132
[10] <i>E.A. Tagirov, I.T. Todorov</i> : A geometric approach to the solution of conformal invariant nonlinear field equations, Acta Phys. Austriaca 51 (1979) 135-154. ....	140
[11] <i>A. Maheshwari, E.R. Nissimov, I.T. Todorov</i> : Classical and quantum two-body problem in general relativity, Lett. Math. Phys. 5 (1981) 359-366. ....	160
[12] <i>T. Palev</i> : Wigner approach to quantization. Noncanonical quantization of two particles interacting via a harmonic potential, J. Math. Phys. 23 (1982) 1778-1784. ....	168
[13] <i>D.D. Bakalov, M.P. Faifman, L.I. Ponomarev, S.I. Vinitsky</i> : $\mu$ -Capture and ortho-para transitions in muonic molecule $pp\mu$ . Nucl. Phys. A384 (1982) 302-322. ....	175
[14] <i>A. Galperin, E. Ivanov, S. Kalitsyn, V. Ogievetsky, E. Sokatchev</i> : Unconstrained $N = 2$ matter, Yang-Mills and supergravity theories in harmonic superspace, Class. Quant. Grav. 1 (1984) 469-498. ....	196

- [15] *V.G. Kac, I.T. Todorov*: Superconformal current algebras and their unitary representations, Commun. Math. Phys. 102 (1985) 337-347. .... 226
- [16] *V.K. Dobrev, V.B. Petkova*: All positive energy unitary irreducible representations of extended conformal supersymmetry, Phys. Lett. B162 (1985) 127-132. .... 237
- [17] *I.K. Kostov*: The ADE face models on a fluctuating planar lattice, Nucl. Phys. B326 (1989) 583-612. .... 243
- [18] *D. Buchholz, G. Mack, R.R. Paunov, I.T. Todorov*: An algebraic approach to the classification of local conformal quantum field theories, in: IX International Congress on Mathematical Physics (Swansea, Wales 1988), eds. B. Simon, A. Truman, I. M. Davis, (Adam Hilger, Bristol, 1989), pp. 299-305. .... 273
- [19] *J.L. Gervais, I.T. Todorov*: Ghost systems as rational conformal theories, Phys. Lett. B219 (1989) 435-438. .... 280
- [20] *E. Nissimov, S. Pacheva, S. Solomon*: The relation between operator and path integral covariant quantizations of the Green-Schwarz superstring, Phys. Lett. B228 (1989) 181-187. 284
- [21] *P. Furlan, Ya.S. Stanev, I.T. Todorov*: Coherent state operators and  $n$ -point invariants for  $U_q(sl(2))$ , Lett. Math. Phys. 22 (1991) 307-319. .... 291
- [22] *I.G. Koh, S. Ouvry, I.T. Todorov*: Chiral partition functions characterizing rational conformal models, Nucl. Phys. B360 (1991) 586-612. .... 304
- [23] *P. Furlan, A.Ch. Ganchev, R. Paunov, V.B. Petkova*: Reduction of the rational spin  $sl(2, \mathbb{C})$  WZNW conformal theory, Phys. Lett. B267 (1991) 63-70. .... 331
- [24] *M.S. Iotov, I.T. Todorov*: On the universal  $R$ -matrix for  $U_q(sl_{r+1})$ , Lett. Math. Phys. 23 (1991) 241-250. .... 339
- [25] *L. Michel, Ya.S. Stanev, I.T. Todorov*: D-E classification of the local extensions of  $SU_2$  current algebras, Theor. Math. Phys. 92 (1993) 1063-1074 [Russian original: Teor. Mat. Fiz. 92(1992) 507-521]. .... 349
- [26] *M. Flato, L.K. Hadjiivanov, I.T. Todorov*: Quantum deformations of singletons and of free zero-mass fields, Found. Phys. (volume dedicated to Asim Barut) 23 (1993) 571-586. 361
- [27] *A.Yu. Alekseev, I.T. Todorov*: Quadratic brackets from symplectic forms, Nucl. Phys. B421 (1994) 413-428. .... 377
- [28] *Ya.S. Stanev, I.T. Todorov*: On Schwarz problem for the  $\widehat{su}_2$  Knizhnik-Zamolodchikov equation, Lett. Math. Phys. 35 (1995) 123-134. .... 393
- [29] *S.T. Petcov*: Describing analytically the matter-enhanced two-neutrino transitions in a medium, Phys. Lett. B406 (1997) 355-365 [hep-ph/9910335]. .... 405
- [30] *N.M. Nikolov, I.T. Todorov*: Rationality of conformally invariant local correlation functions on compactified Minkowski space. Commun. Math. Phys. 218 (2001) 417-436 [hep-th/0009004]. .... 416
- [31] *M. Dubois-Viollette, T. Popov*: Homogeneous algebras, statistics and combinatorics, Lett. Math. Phys. 61 (2002) 159-170. .... 436
- [32] *K. Gawedzki, I.T. Todorov, P. Tran-Ngoc-Bich*: Canonical quantization of the boundary Wess-Zumino-Witten model, Commun. Math. Phys. 248 (2004) 217-254 [hep-th/0101170]. 448
- [33] *N.M. Nikolov, Ya.S. Stanev, I.T. Todorov*: Global conformal invariance and bilocal fields with rational correlation functions, in: Proceedings of the 3rd International Sakharov Conference on Physics, Moscow, Russia, 24-29 Jun 2002. Vol. 2, pp. 256-268; ESI preprint 1243 (2003); hep-th/0211106. .... 486

- [34] *N.M. Nikolov, K.-H. Rehren, I.T. Todorov*: Partial wave expansion and Wightman positivity in conformal field theory, Nucl. Phys. B722 (2005) 266-296 [hep-th/0504146]. . 499

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- [35] *I.T. Todorov*: Discrete series of hermitian representations of the Lie algebra of  $U(p, q)$ , International Centre for Theoretical Physics, IC/66/71, Trieste 1966, 34p. .... 537
- [36] *G. Mack, I.T. Todorov*: Irreducibility of the ladder representations of  $U(2, 2)$  when restricted to the Poincare subgroup, J. Math. Phys. 10 (1969) 2078-2085. .... 573
- [37] *I.T. Todorov*: Quasi-potential approach to the two-body problem in quantum field theory, in: Properties of Fundamental Interactions, 9C, ed. A. Zichichi, Editrice Compositori, Bologna 1973, pp. 951-979. .... 581
- [38] *I.T. Todorov*: Dynamics of relativistic point particles as a problem with constraints, Commun. JINR E210125, Dubna (1976) 26p. .... 610
- [39] *V.V. Molotkov, I.T. Todorov*: Gauge dependence of world lines and gauge invariance of the  $S$ -matrix in the relativistic classical mechanics, Commun. Math. Phys. 79 (1981) 111-132. 636
- [40] *P.A. Nikolov, I.T. Todorov*: Space-time versus phase space approach to relativistic particle dynamics, in: Twistor Geometry and Non-Linear Systems, ed. H. Doebner, T. Palev, Lecture Notes in Math. 970, (Springer, 1982), pp. 197-216. .... 658
- [41] *V.A. Rizov, H. Sazdjian, I.T. Todorov*: On the relativistic quantum mechanics of two interacting spinless particles, Ann. Phys. 165 (1985) 59-97. .... 678
- [42] *I.T. Todorov*: Infinite Lie algebras in 2-dimensional conformal field theory, in: Differential Geometric Methods in Theoretical Physics, Proceedings (Shumen, Bulgaria 1984), eds. H.D. Doebner, T. Palev, (World Scientific, Singapore, 1986), pp. 297-347. .... 717
- [43] *G.M. Sotkov, I.T. Todorov, M.S. Stanishkov, V.Yu. Trifonov*: Higher symmetries in conformal QFT models, in: Topological and Geometrical Methods in Field Theory, eds. J. Hietarinta, J. Westerholm, (World Scientific 1986) pp. 195-217 ..... 768
- [44] *V.G. Kac, I.T. Todorov*: Affine orbifolds and rational conformal field theory extensions of  $W_{1+\infty}$ , Commun. Math. Phys. 190 (1997) 57-111. .... 791
- [45] *A. Cappelli, L.S. Georgiev, I.T. Todorov*: A unified conformal field theory description of paired quantum Hall states, Commun. Math. Phys. 205 (1999) 657-689. .... 846
- [46] *M. Dubois-Violette, P. Furlan, L.K. Hadjiivanov, A.P. Isaev, P.N. Pyatov, I.T. Todorov*: A finite dimensional gauge problem in the WZNW model, in: Quantum Theory and Symmetries (Goslar, Germany 1999), eds. H.D. Doebner, V. K. Dobrev (World Scientific, Singapore, 2000), pp. 331-349. .... 879
- [47] *V.B. Petkova, J.-B. Zuber*: The many faces of Ocneanu cells, Nucl. Phys. B603 (2001) 449-496. .... 899
- [48] *P.P. Fiziev, I.T. Todorov*: Effective one-body approach to the relativistic two-body problem, Phys. Rev. D63 (2001) 104007, 9 pages [gr-qc/0010104]. .... 947

[49] <i>I.T. Todorov, L.K. Hadjiivanov</i> : Monodromy representations of the braid group, Phys. Atom. Nucl. 64 (2001) 2059-2068 [Yad. Fiz. 64 (2001) 2149-2158][CERN-TH-2000-362, hep-th/0012099].	956
[50] <i>I.T. Todorov</i> : Two-dimensional conformal field theory and beyond. Lessons from a continuing fashion. Lett. Math. Phys. 56 (2001) 151-161.	966
[51] <i>N.M. Nikolov, I.T. Todorov</i> : Conformal invariance and rationality in an even dimensional quantum field theory, Int. J. Mod. Phys. A19 (2004) 3605-3636 [math-ph/0405005].	977
[52] <i>B. Bakalov, N.M. Nikolov, K.-H. Rehren, I.T. Todorov</i> : Unitary positive-energy representations of scalar bilocal quantum fields, Commun. Math. Phys. 271 (2007) 223-246; math-ph/0604069.	1009
[53] <i>I.T. Todorov</i> : Werner Heisenberg (1901-1976), physics/0503235	1033
[54] <i>I.T. Todorov</i> : Einstein and Hilbert: The creation of general relativity, physics/0504179	1054
[55] <i>I.T. Todorov</i> : Kurt Goedel and his universe, talk presented at the IV International Conference "Gravity, Astrophysics & Strings the Black Sea", Primorsko, June 11-15, 2007. arXiv:0709.1387v3 [physics.hist-ph]	1069
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