The publications of Moshé Flato

1964

1. Sur les formules de masses fortes et électromagnétiques des particules élémentaires, *C. R. Acad. Sci. Paris* **249**, 3455–3458 (with J. Sternheimer).

1965

2. Ionic energy levels in trigonal and tetragonal fields, *J. Molecular Spectroscopy* **17**, 300–324.

3. Definition of $P.C.T.$ operators for the relativistic-rotator model and the Bronzan-Low symmetry, *Nuclear Phys.* **61**, 250–256 (with G. Rideau and J.-P. Vigier).

4. On the "space-time character" of internal symmetries of elementary particles, *Nuovo Cimento* **36**, 672–675 (with D. Bohm, F. Halbwachs, P. Hillion, and J.-P. Vigier).

5. Algèbres unifiantes. Applications à l'algèbre de Lie du groupe de Poincaré, *C. R. Acad. Sci. Paris* **260**, 3532–3534 (with D. Sternheimer).

6. Le groupe conforme comme possibilité de symétrie unifiée en physique des interactions fortes, *C. R. Acad. Sci. Paris* **260**, 3869–3872 (with D. Sternheimer and J.-P. Vigier).

7. Conformal group symmetry of elementary particles, *Nuovo Cimento* **38**, 1941–1944 (with D. Bohm, D. Sternheimer, and J.-P. Vigier).

8. Remarks on the connection between external and internal symmetries, *Phys. Rev. Lett.* **15**, 934–936 (with D. Sternheimer).

1966

9. On the connection between external and internal symmetries of strongly interacting particles, *J. Math. Phys.* **7**, 1932–1958 (with D. Sternheimer).

10. On the masses of nonstrange pseudoscalar mesons and the generalized Klein-Gordon equation, *Nuovo Cimento A* **42**, 431–434 (with D. and J. Sternheimer, J.-P. Vigier, and G. Wataghin).

11. Local representations and mass-spectrum, *Phys. Rev. Lett.* **16**, 1185–1186 (with D. Sternheimer).

12. Remarques sur les automorphismes causals de l'espace-temps, *C. R. Acad. Sci. Paris Sér. A-B* **263**, A935–A938 (with D. Sternheimer).

1967

13. *Symétries de type lorentzien et interactions fortes*, Gauthier-Villars Éditeur, Paris. (Thèse de Doctorat-ès-Sciences, Juin 1965.)

14. Un groupe de type Poincaré associé à l'equation de Dirac-Weyl, *C. R. Acad. Sci. Paris* **264**, 85–88 (with P. Hillion and D. Sternheimer).

15. Nonuniqueness of mass-formulas from infinite-dimensional groups and algebras, *Phys. Rev. Lett.* **19**, 254–255 (with D. Sternheimer).

1968

16. Sur l'unification des symétries externe et interne, in: *L'extension du groupe de Poincaré aux symétries internes des particules élementaires*, Éditions du CNRS, Paris, pp. 47–60. (Colloque international No 159, Gif-sur-Yvette, April 1966.)

1969

17. Poincaré partially integrable local representations and mass-spectrum, *Comm. Math. Phys.* **12**, 296–303 (with D. Sternheimer).

18. On an infinite-dimensional group, *Comm. Math. Phys.* **14**, 5–12 (with D. Sternheimer).

19. Groupe conforme, covariance des équations des champs et analyse dimensionnelle, *C. R. Acad. Sci. Paris* **268**, 1065–1068 (with P. Hillion and J. Simon).

20. Sur la covariance conforme d'une équation de spin quelconque, *C. R. Acad. Sci. Paris Sér. A-B* **269**, A1051–A1054 (with J. Simon).

1970

21. Poincaré-like group associated with neutrino physics, and some applications, *Phys. Rev. D* **1**, 1667–1673 (with P. Hillion).

22. Conformal covariance of field equations, *Ann. Physics* **61**, 78–97 (with J. Simon and D. Sternheimer).

23. Sur les représentations de l'algèbre de Lie de Poincaré, *C. R. Acad. Sci. Paris Sér. A-B* **270**, A914–A917 (with J.-C. Guillot and D. Sternheimer).

1971

24. Field theory on curved space-time and the TCP theorem, *Phys. Scripta* **3**, 53–54 (with J. Simon).

25. Flots ergodiques et mesures complexes, *C. R. Acad. Sci. Paris Sér. A-B* **272**, A892–A895 (with B. Nagel and D. Sternheimer).

1972

26. Wightman formulation for quantization of the gravitational field, *Phys. Rev. D* **5**, 332–341 (with J. Simon).

27. Restrictions from geometry on quantization in curved space-time, *Phys. Rev. Lett.* **28**, 385–387 (with J. Simon and D. Sternheimer).

28. Comments on proposed two-component spin 1/2 wave equations, *Phys. Scripta* **5**, 153–4 (with G. Lindblad and B. Nagel).

29. Simple facts about analytic vectors and integrability, *Ann. Sci. École Norm. Sup. (4)* **5**, 432–434 (with J. Simon, H. Snellman, and D. Sternheimer).

1973

30. A short survey of modern statistical mechanics, in: A. O. Barut, (ed.), *Studies in Mathematical Physics (Istanbul 1970)*, D. Reidel, Dordrecht, pp. 113–134.

31. Separate and joint analyticity in Lie groups representations, *J. Funct. Anal.* **13**, 268–276 (with J. Simon).

32. Sur l'intégrabilité des représentations antisymétriques des algèbres de Lie compactes, *C. R. Acad. Sci. Paris Sér. A-B* **277**, A939–A942 (with J. Simon and D. Sternheimer).

1974

33. Regge Lattice and Lie algebra representations, *J. Math. Phys.* **15**, 857–860 (with H. Snellman).

34. Generalized covariance principles and neutrino physics, *J. Math. Phys.* **15**, 1288–1294 (with A. Piard).

35. Remarks on axiomatic approach to quantum gravity, *Helv. Phys. Acta* **47**, 114–118 (with J. Simon and D. Sternheimer).

36. On the localizability of massless particles. *Phys. Scripta* **9**, 173–183 (with E. Angelopoulos and F. Bayen).

37. Déformations 1-différentiables des algèbres de Lie attachées à une variété symplectique ou de contact, *C. R. Acad. Sci. Paris Sér. A-B* **279**, A877–A881 (with A. Lichnerowicz and D. Sternheimer).

1975

38. Remarks concerning Nambu's generalized mechanics, *Phys. Rev. D* **11**, 3049–3053 (with F. Bayen).

39. Are Bell's inequalities concerning hidden variables really conclusive? *Helv. Phys. Acta* **48**, 219–225 (with J. Gréa, C. Piron, D. Sternheimer, and J.-P. Vigier).

40. Déformations 1-différentiables d'algèbres de Lie attachées à une variéte symplectique ou de contact, *Compositio Math.* **31**, 47–82 (with A. Lichnerowicz and D. Sternheimer).

41. Algèbres de Lie attachées à une variété canonique, *J. Math. Pures Appl.* **54**, 445–480 (with A. Lichnerowicz and D. Sternheimer).

1976

42. Quantum mechanics and determinism. In: M. Flato et al., (eds.), *Quantum mechanics, Determinism, Causality and Particle*, Mathematical Physics and Applied Mathematics vol. 1, D. Reidel, Dordrecht, pp. 19–31.

43. Remarks on conformal space, *J. Math. Phys.* **17**, 1112–1114 (with F. Bayen).

44. Theory of analytic vectors and applications, in: K. Maurin and R. Rączka, (eds.), *Mathematical physics and physical mathematics*, Mathematical Physics and Applied Mathematics vol. 2, D. Reidel, Dordrecht, pp. 231–250.

45. Deformation of Poisson brackets, Dirac Brackets, and applications, *J. Math. Phys.* **17**, 1754–1762 (with A. Lichnerowicz and D. Sternheimer).

46. Crochet de Moyal-Vey et quantification *C. R. Acad. Sci. Paris Sér. A-B* **283**, A19–A24 (with A. Lichnerowicz and D. Sternheimer).

1977

47. On space-like fields, *Helv. Phys. Acta* **50**, 117–122 (with M. Guenin).

48. On parity, charge-conjugation and time-reversal violation in relativistic classical non-linear field theory, *Lett. Math. Phys.* **1**, 443–453 (with R. Rączka).

49. Quantum mechanics as a deformation of classical mechanics, *Lett. Math. Phys.* **1**, 521–530 (with F. Bayen, C. Fronsdal, A.Lichnerowicz, and D. Sternheimer).

50. Non-linear representations of Lie groups, *Ann. Sci. École Norm. Sup. (4)* **10**, 405–418 (with G. Pinczon and J. Simon).

51. Non-linear wave equations and covariance, Lett. Math. Phys. **2**, 115–160 (with J. Simon).

1978

52. Deformation theory and quantization I, Deformations of symplectic structures, *Ann. Physics* **111**, 61–110 (with F. Bayen, C. Fronsdal, A. Lichnerowicz, and D. Sternheimer).

53. Deformation theory and quantization II, Physical Applications, *Ann. Physics* **111**, 111–151 (with F. Bayen, C. Fronsdal, A. Lichnerowicz, and D. Sternheimer).

54. On unitary implementability of conformal transformations, *Lett. Math. Phys.* **2**, 405–412 (with E. Angeloupoulos).

55. One massless particle equals two Dirac singletons, *Lett. Math. Phys.* **2**, 421–426 (with C. Fronsdal).

1979

56. Yang-Mills equations are formally linearizable, *Lett. Math. Phys.* **3**, 279–283 (with J. Simon).

1980

57. Deformations of Poisson brackets, separate and joint analyticity in group representations, nonlinear group representations and physical applications, in: J. A. Wolf et al., (eds.), *Harmonic analysis and representations of semisimple Lie groups*, Mathematical Physics and Applied Mathematics vol. 5, D. Reidel, Dordrecht, pp. 385–448 (with D. Sternheimer).

58. Linearization of relativistic non-linear wave equations, *J. Math. Phys.* **21**, 913–917 (with J. Simon).

59. On parity, charge conjugation and time reversal violation in models of relativistic quantum field theory, *Phys. Rev. D* **21**, 341–451 (with R. Rączka).

60. On a linearization program of non-linear field equations, *Phys. Lett. B* **94**, 518–522 (with J. Simon).

61. Cohomologie des représentations définies par la dérivation de Lie et à valeurs dans les formes de l'algèbre de Lie des champs de vecteurs d'une variété différentiable. Premiers espaces de cohomologie. Applications, *C. R. Acad. Sci. Paris Sér. A-B* **291**, A331–A335 (with A. Lichnerowicz).

62. On Dis and Racs, *Phys. Lett. B* **97**, 236–240 (with C. Fronsdal).

1981

63. Star products. Quantization and representations without operators, in: E. Tirapegui, (ed.), *Field theory, Quantization and Statistical Physics*, Mathematical Physics and Applied Mathematics vol. 6, D. Reidel, Dordrecht, pp. 85–111 (with D. Arnal, J.-C. Cortet, and D. Sternheimer).

64. Massless particles, conformal group and De Sitter universe, *Phys. Rev. D* **23**, 1278–1289 (with E. Angelopoulos, C. Fronsdal, and D. Sternheimer).

65. Quantum field theory of singletons. The Rac. *J. Math. Phys.* **22**, 1100–1105 (with (C. Fronsdal).

66. Mass generation within conformal invariant theories, *Nuovo Cimento* **31**, 248–252 (with M. Guenin).

1982

67. Presentation of the contributions in group theory at this conference, in: R Schrader et al., (eds.), *Mathematical problems in theoretical physics*, Proceedings of the 1981 IAMP Conference on Mathematical Physics. Lectures Notes in Physics vol. 153, Springer Verlag, Berlin-New York, pp. 327–328.

68. Deformation view of physical theories, *Czech. J. Phys. B* **32**, 472–475.

69. De Sitter conformal field theories, *Czech. J. Phys. B* **32**, 439–471 (with B. Binegar, C. Fronsdal, and S. Salamo).

70. Mass-generation, symmetry breaking and conformal invariance, *Czech. J. Phys. B* **32**, 490–493 (with M. Guenin).

1983

71. Physique et Information. Exposé au séminaire interdisciplinaire du Collège de France, in: A. Lichnerowicz et al., (eds.), *Information et communication*, Maloine, Paris, pp. 27–40.

72. Difficulties with massless particles? *Comm. Math. Phys.* **90**, 563–573 (with C. Fronsdal and D. Sternheimer).

73. Particules de masse nulle revisitées, in: *Journées Relativistes*, Lyon 1982.

1984

74. Representations of conformal supersymmetry, *Lett. Math. Phys.* **8**, 159–162 (with C. Fronsdal).

75. Déformations et mécanique statistique, *C. R. Acad. Sci. Paris Sér. I Math.*, **299**, 405–410 (with H. Basart, A. Lichnerowicz, and D. Sternheimer).

76. Deformation theory applied to quantization and statistical mechanics, *Lett. Math. Phys.* **8**, 483–494 (with H. Basart, A. Lichnerowicz, and D. Sternheimer).

1985

77. Conformal invariance and gauge fixing in QED, *Phys. Rev. D* **32**, 2673–2682 (with F. Bayen, C. Fronsdal, and A. Haidari).

78. Do different deformations lead to the same spectrum? *J. Geom. Phys.* **2**, 35–48 (with M. Cahen, S. Gutt, and D. Sternheimer).

79. Small global strong solutions for the Navier-Stokes equations in R^4 (multigraphié, Dijon, with J. Simon and E. Taflin).

1986

80. Masslessness and light-cone propagation in 3+2 De Sitter and 2+1 Minkowski spaces, *Phys. Rev. D* **33**, 415–420 (with C. Fronsdal and J.-P. Gazeau).

81. Quarks or Singletons? *Phys. Lett. B* **172**, 412–416 (with C. Fronsdal).

82. Spontaneously generated field theories, zero-center modules, colored singletons and the virtues of $N = 6$ supergravity, in: C. Fronsdal, (ed.), *Essays in supersymmetry* , Mathematical Physics Studies vol. 8, D. Reidel, Dordrecht, pp. 123–162 (with C. Fronsdal).

83. Singletons: Fundamental Gauge Theory, in: J. Hietarinta and J. Westerholm, (eds.), *International Symposium on Topological and Geometrical Methods in Field Theory (Espoo, 1986)*, World Scientific Publ., Teaneck, NJ, pp. 273–290 (with C. Fronsdal).

1987

84. The singleton dipole, *Comm. Math. Phys.* **108**, 469–482 (with C. Fronsdal).

85. How BRST invariance of QED is induced from the underlying field theory, *Phys. Lett. B* **189**, 145–148 (with C. Fronsdal).

86. On global solutions of the Maxwell-Dirac equations, *Comm. Math. Phys.* **112** (special issue for W. Thirring), 21–49 (with J. Simon and E. Taflin).

1988

87. Singletons as a basis for composite conformal quantum electrodynamics, in: M. Cahen and M. Flato, (eds.), *Quantum Theories and Geometry*, Mathematical Physics Studies vol. 10, Kluwer Acad. Publ., Dordrecht, pp. 65–76 (with C. Fronsdal and D. Sternheimer).

88. Composite electrodynamics, *J. Geom. Phys.* **5**, 37–61 (special issue for I. M. Gelfand), (with C. Fronsdal).

1989

89. Parastatistics, highest weight $osp(n,\infty)$ modules, singleton statistics and confinement, *J. Geom. Phys.* **6**, 293–309 (with C. Fronsdal).

90. Three-dimensional singletons, *Lett. Math. Phys.* **20**, 65–74 (with C. Fronsdal).

1990

91. Physique et Vérité, in: Lothaire, M., (ed.), *Mots, volume in honor of M. Schutzenberger*, Hermès, Paris, pp. 70–80.

92. *Le Pouvoir des Mathématiques*, Hachette, Paris. (Translated into several languages, including in 1992 in English at McGraw-Hill.)

1991

93. Non abelian singletons, *J. Math. Phys.* **32**, 524–531 (with C. Fronsdal).

94. Remarks on quantum groups, *Lett. Math. Phys.* **21**, 85–88 (with Z. C. Lu).

95. On a possible origin of quantum groups, *Lett. Math. Phys.* **22**, 155–160 (with D. Sternheimer).

1992

96. Three D Singletons and 2-D C.F.T., *Internat. J. Modern Phys. A* **7**, 2193–2206 (with A. M. Harun Ar.Rashid and C. Fronsdal).

97. Closed star-products and cyclic cohomology, *Lett. Math. Phys.* **24**, 1–12 (with A. Connes and D. Sternheimer).

98. A natural and rigid model of quantum groups, *Lett. Math. Phys.* **25**, 75–84 (with P. Bonneau and G. Pinczon).

1993

99. From where do quantum groups come? *Found. Phys.* **23**, 587–598 (with D. Sternheimer and Z. C. Lu).

100. Quantum deformations of singletons and of free zero-mass fields, *Found. Phys.* **23**, 571–586 (with L. K. Hadjiivanov and I. T. Todorov).

101. Quantum groups, star-products and cyclic cohomology, in: H. Araki, K. Ito, A. Kishimoto, and I. Ojima, (eds.), *Quantum and Non-Commutative Analysis*, Mathematical Physics Studies vol. 16, Kluwer Acad. Publ., Dordrecht, pp. 221–337 (with D. Sternheimer).

1994

102. Star-products, quantum groups, cyclic cohomology and pseudo-differential calculus, in: P. Sally et al., (eds.), *Mathematical aspects of conformal and topological field theories and quantum groups (South Hadley, MA, 1992)*, Contemp. Math., 175, Amer. Math. Soc., Providence, RI, pp. 53–72 (with D.Sternheimer).

103. The hidden group structure of quantum groups: strong duality, rigidity and preferred deformations, *Comm. Math. Phys.* **161**, 125–156 (with P. Bonneau, M. Gerstenhaber, and G. Pinczon).

104. The Maxwell-Dirac equations: asymptotic completeness and the infrared problem, *Rev. Math. Phys.* **6** (special issue in honor of E. Lieb), 1071–1083 (with J. Simon and E. Taflin).

105. Closedness of star products and cohomologies, in: J.-L. Brylinski et al., (eds.), *Lie Theory and Geometry: In Honor of B. Kostant*, Progress in Mathematics, Birkhäuser, Boston, pp. 241–259 (with D. Sternheimer).

106. Topological quantum groups, star products and their relations, *St. Petersburg Math. J.* (Algebra and Analysis) **6**, 242–251 (with D. Sternheimer).

1995

107. Cohomology and deformation of Leibniz pairs, *Lett. Math. Phys.* **34**, 77–90 (with M. Gerstenhaber and A. Voronov).

1996

108. Nambu mechanics: classical and quantum aspects, Notes for the symposium *Symplectic and Poisson Geometry* (Ogaki, 27 November 1996).

1997

109. Deformation Quantization and Nambu Mechanics, *Comm. Math. Phys.* **183**, 1–22 (with G. Dito, D. Sternheimer, and L. Takhtajan).

110. Nonlinear Relativistic Wave Equations in General Dimensions, in: Li Ta-Tsien, (ed.), *Collected Papers on Geometry, Analysis and Mathematical Physics, in Honour of Professor Gu ChaoHao*, World Scientific, pp. 53–70 (with J. C. H. Simon, D. Sternheimer, and E. Taflin).

111. *The Maxwell-Dirac equations: the Cauchy problem, asymptotic completeness and the infrared problem*, Memoirs of the American Mathematical Society, **127**, no. 606 (x + 312 pages), (with J. C. H. Simon and E. Taflin).

112. Generalized Abelian Deformations: Application to Nambu Mechanics, *Lett. Math. Phys.* **39**, 107–125 (with G. Dito).

113. Nambu mechanics, *n*-ary operations and their quantization, in: D. sternheimer et al., (eds.), *Deformation theory and symplectic geometry (Ascona 1996)*, Math. Physics Studies vol. 20, Kluwer Acad. Publ., Dordrecht, pp. 43–66 (with G. Dito and D. Sternheimer).

1998

114. Some infinite dimensional algebras arising in spin systems and in particle physics and their grand algebra, *Lett. Math. Phys.* **43**, 155–171 (with H. Araki, S. Michéa, and D. Sternheimer).

115. Interacting singletons, *Lett. Math. Phys.* **44**, 249–259 (with C. Frønsdal).

116. Two disjoint aspects of the deformation programme: quantizing Nambu mechanics; singleton physics, in: J. Rembieliński, (ed.), *Particles, Fields and Gravitation* (AIP Conference Proceedings **453**), American Institute of Physics, Woodbury, NY, pp. 49–52.

117. The deformation programme in physical theories: usual and unusual deformation quantization; singleton physics, in: Yu. Novozhilov, (ed.), *Quantum Theory, in honour of Vladimir A. Fock*, Proceedings of the VIII Unesco International School of Physics, St. Petersburg, 25 May - 6 June 1998, 10–37 (with D. Sternheimer).

1999

118. Singleton physics, *Proceedings of the Steklov Mathematical Institute* **226**, 185–192 (with C. Frønsdal and D. Sternheimer).

119. Singletons, physics in AdS universe and oscillations of composite neutrinos, *Lett. Math. Phys.* **48**, 109–119 (with C. Frønsdal and D. Sternheimer).