

Bibliography of Stephen L. Adler

Books

Current Algebras (with R.F. Dashen), W.A. Benjamin, Inc., New York, 1968.

Quaternionic Quantum Mechanics and Quantum Fields, Oxford University Press, New York (1995).

Quantum Theory as an Emergent Phenomenon, Cambridge University Press, Cambridge (2004). See also hep-th/0206120.

Adventures in Theoretical Physics: Selected Papers with Commentaries, World Scientific Publishing Company (2006). Unindexed draft at hep-th/0505177.

The Guide to PAMIR: Theory and Use of Parameterized Adaptive Multidimensional Integration Routines, World Scientific Publishing Co. Pte. Ltd., Singapore (2013). See also arXiv:1009.4647.

Patent

U.S. Patent No. 5,261,035 – “Neural Network Architecture Based on Summation of Phase-Coherent Alternating Current Signals.”

Summer School Lectures

Current Algebras, in “Proceedings of the International School of Physics ‘Enrico Fermi,’ Course XLI,” Academic Press, New York, 1968.

Perturbation Theory Anomalies, in “Brandeis Summer Lectures in Theoretical Physics,” 1970, M.I.T. Press, Cambridge, 1970.

Neutrino Interaction Phenomenology and Neutral Currents, in “Proceedings of the Sixth Hawaii Topical Conference in Particle Physics (1975),” P.N. Dobson et al., eds., University Press of Hawaii, Manoa/Honolulu, 1976; reprinted in “Selected Lectures, Hawaii Topical Conference in Particle Physics,” S. Pakvasa and S.F. Tuan, eds., World Scientific, 1982.

Induced Gravitation and Discussion, in “The High Energy Limit” (the 1980 Erice Lectures), A. Zichichi, ed., Plenum Press, New York, 1980.

Non-Local Gauge Theories: Three Lectures and Three Discussions, in “The High Energy Limit” (1980 Erice Lectures), A. Zichichi, ed., Plenum Press, New York, 1980.

Quaternionic Quantum Field Theory, in “Quantum Mechanics of Fundamental Systems 1” (Series of the Centro de Estudios Científicos de Santiago), C. Teitelboim, ed., Plenum Press, New York, 1988.

Conference Proceedings and Other Contributions

Tests of the Conserved Vector Current and Partially-Conserved Axial-Vector Current Hypotheses in High-Energy Neutrino Reactions, in “Proceedings of the Informal Conference on Experimental Neutrino Physics,” CERN 65-32, 1965.

High Energy Semileptonic Reactions, in “Proceedings of the International Conference on Weak Interactions,” Argonne National Lab. ANL-7130, 1966.

Measurement of the Nucleon Axial-Vector Form Factor, in “Nobel Symposium 8 - Elementary Particle Theory,” Almquist and Wiksell, Stockholm, 1968.

Untitled Remarks on Experimental Test of Local Current Algebra, in the Proceedings of the 14th Solvay Congress (on “Fundamental Problems in Elementary Particle Physics”), Wiley, New York, 1969.

π^0 Decay, in “High-Energy Physics and Nuclear Structure,” Plenum Press, 1970.

Theories of the Fine Structure Constant α , in “Proceedings of the Third International Conference on Atomic Physics,” Plenum Press, New York, 1973.

Short Distance Behavior of Quantum Electrodynamics and an Eigenvalue Condition for α , in “Proceedings of the XVI International Conference on High Energy Physics,” National Accelerator Laboratory, Batavia 1972.

Accelerator Neutrino Physics, Present and Future - A Review for Theorists and Experimentalists, Notes for talk given at the NAL Topical Conference on Neutrino Physics, March 29-30, 1974. (Unpublished)

Anomalies in Ward Identities and Current Commutation Relations, in “*Local Currents and Their Applications*,” D.H. Sharp and A.S. Wightman, eds. (North-Holland, Amsterdam/American Elsevier, New York, 1974).

Theoretical Interpretation of Recent Neutral Current Results, A talk given at the 1975 Coral Gables Conference, “Orbis Scientie II,” January 22, 1975.

Photon Pairing Instabilities: A Microscopic Origin for Gravitation?, to be published in the proceedings of the 8th International Conference on General Relativity & Gravitation, August 7-12, 1977, Ontario, Canada. 9/78: The volume was not published. This work appears only as an IAS Preprint COO-2220-120, Aug. 1977.

Gauge Theories and Neutrino Interactions, in “Gauge Theories and Modern Field Theory,” R. Arnowitt and P. Nath, eds. (MIT Press, Cambridge, 1976).

General Introduction, “Gauge Theories and Neutrino Physics,” M. Jacob, ed., Physics Reports Reprint Book Series, Vol. 2, North-Holland, Amsterdam, 1978.

A Relaxation Method for the Euclidean Yang-Mills Action Functional and Its Application to $n=2,3$ Multimonopole Solutions (with Tsvi Piran), in “High Energy Physics – 1980” (XX International Conference, Madison, Wisconsin), Part 2, Loyal Durand and Lee G. Pondrom, eds., A.I.P., New York, 1981, pp. 958-962. [A.I.P. Conference Proceedings, Hugh C. Wolfe, series ed., No. 68, Particles and Fields Subseries, No. 22.]

The Mechanism for Confinement in Massive Quark QCD, in “Unified Field Theories and Beyond,” Proceedings of the 5th Johns Hopkins Workshop on Current Problems in Particle Theory (Johns Hopkins, Baltimore, 1981).

Non-Abelian Statics, in “J.C. Maxwell, The Sesquicentennial Symposium,” M.S. Berger, ed. (North-Holland, Amsterdam, 1984).

Quark Statics, in “Workshop on Non-Perturbative Quantum Chromodynamics,” K.A. Milton and M.A. Samuel, eds. (Birkhäuser, Boston, 1983).

Einstein Gravitation as a Long Wavelength Effective Field Theory, in *Phil. Trans. Royal Soc. London* **A310**, 273 (1983).

Dynamical Applications of the Gauge-Invariant Effective Action Formalism, in “Quantum Theory of Gravity,” S. Christensen, ed. (Adam Hilger, Bristol, 1984).

Confinement in Continuum QCD - The Dielectric Picture, in “QCD and Beyond,” the Proceedings of the Rencontres de Moriond, March 1985, J. Tran Thanh Van, ed. (Editions Frontières, 1985).

Quaternionic Gaussian Multiple Integrals, in “Quantum Field Theory and Quantum Statistics: Essays in Honor of the 60th Birthday of E.S. Fradkin,” pp. 601-623, I.A. Batalin, C.J. Isham and G.A. Vilkovisky, eds., (Adam Hilger, 1987).

Quaternionic Quantum Field Theory, in the Proceedings of the Tenth Hawaii Conf. on High Energy Physics, S. Pakvasa and S.F. Tuan, eds. (Univ. of Hawaii Press, Manoa/Honolulu, 1985).

Gap Equation Models for Chiral Symmetry Breaking, *Prog. Theor. Phys. (Suppl.)* **86**, 12 (1986).

Implications of Scalar Confinement for Chiral Symmetry Breaking in QCD, in “Strong Interactions and Gauge Theories,” the Proceedings of the Rencontres de Moriond, 1986, J. Tran Thanh Van, ed., (Editions Frontières, 1986).

Quaternionic Field Theory and a Possible Dynamics for Composite Quarks and Leptons, in “Progress in Electroweak Interactions,” the Proceedings of the Rencontres de Moriond, 1986, J. Tran Thanh Van, ed. (Editions Frontières, 1986).

Commentary on “Axial-Vector Vertex in Spinor Electrodynamics,” in “Contemporary Classics in Physical, Chemical and Earth Sciences,” A. Thackray, ed. (ISI Press, 1986).

Quaternionic Quantum Field Theory, in “Niels Bohr: Physics and the World” Proceedings of the Niels Bohr Symposium, November 1985, H. Feshbach, T. Matsui and A. Oleson, eds., (Harwood Academic Publishers, New York, 1988), p. 213.

Snowmass '86, article in the Physics News Section of the January, 1987 issue of Physics Today.

Looking for Compositeness at the SSC by Probing for Large P or T Violations, in the Proceedings of the Summer Study on the Physics of the Superconducting Supercollider, Snowmass, 1986, R. Donaldson and J. Marx, eds.

Lattice Higgs Workshop - Conference Summary, in Lattice Higgs Workshop, B. Berg, et al. eds. (World Scientific, 1988), p.1.

Scattering Theory in Quaternionic Quantum Mechanics and T-Violation, talk given at the Landau Memorial Conference on Frontiers of Physics, Tel Aviv, Israel (June 6-10, 1988), to appear in the Conference Proceedings.

Algorithms for Pure Gauge Theory, in Lattice 88, A.S. Kronfeld and P.B. Mackenzie, eds., *Nucl. Phys. B (Proc. Suppl.)* **9** (North-Holland, Amsterdam, 1989).

Sakharov and Induced Gravitation, in the Sakharov Memorial Issue of Piroda, August 1990; to be reprinted by the American Institute of Physics in “Sakharov Remembered: A Tribute by Friends and Colleagues,” S. Drell and S. Kapitza, eds.

Scattering Theory in Quaternionic Quantum Mechanics, in *From Symmetries to Strings: Forty Years of Rochester Conferences*, A. Das, ed., World Scientific, Singapore, 1990.

Linear Momentum and Angular Momentum in Quaternionic Quantum Mechanics, in *Quarks, Symmetries and Strings*, M. Kaku, A. Jevicki and K. Kikkawa, eds., World Scientific, Singapore, 1991.

Effective Action Model for the Cosmological Constant Revisited, in *Gravitation and Modern Cosmology*, A. Zichichi, V. de Sabbata and N. Sánchez, eds., Plenum Press, NY, 1991.

Accelerating Abelian Gauge Dynamics (with G. Bhanot), talk given by G. Bhanot at the “Lattice ’90” Conference, Florida State University, Tallahassee, 11/90, Nucl. Phys. (Proc. Suppl.) **B20**, 114 (1991).

Generalized Quantum Dynamics: A Formalism Encompassing Both Classical and Quantum Theory, to appear in Proc. of the 4th Drexel Symposium on Quantum Nonintegrability, Sept., 1994, D.H. Feng, ed.

“Gauge Invariance” and “Gauge Theories”, articles in the Macmillan Encyclopedia of Physics, J.S. Rigden, ed., Simon & Schuster Macmillan, NY, 1996.

Algebra of Conserved Generators and Statistical Ensembles in Generalized Quantum Dynamics (with L.P. Horwitz), presented by L.P. Horwitz at the Workshop on Algebraic Approaches to Quantum Dynamics, May 7-12, 1995, at the Fields Inst. for Res. and Math. Sciences, Toronto, Ontario, Canada (to appear in the proceedings).

Quaternionic Quantum Mechanics and Noncommutative Dynamics, to appear in the Proc. of the 2nd Sakharov Memorial Conf., Moscow, May 20-25, 1995, I. Dremin and A. Semikhatov, eds., by World Scientific, 1997.

Equilibrium Statistical Ensembles and Structure of the Entropy Functional in Generalized Quantum Dynamics (with L.P. Horwitz), presented by L. Horwitz at *Quantum Structures '96*, Berlin, July 29-August 3, 1996, Int'l. J. Theor. Phys. **37**, 519 (1998).

What Chiral Symmetry Teaches Us About Particle Properties, Dirac Prize lecture, June, 1999; to be published by the ICTP, Trieste.

Probability in Orthodox Quantum Mechanics: Probability as a Postulate Versus Probability as an Emergent Phenomenon, IASSNS-HEP-00/30, talk given at the Ischia Conference on Chance in Physics: Foundations and Perspectives, November, 1999.

Sam Bard Treiman, May 27, 1925 - November 30, 1999, to appear in the Biographical Memoirs of the National Academy of Sciences.

Anomalies to All Orders, in G. 't Hooft, ed., “50 Years of Yang-Mills Theory,” World Scientific, Singapore, 2005. See also hep-th/0405040.

Monopoles and Projective Representations: Two Areas of Influence of Yang-Mills Theory on Mathematics, math-ph/0405049.

Anomalies, hep-th/0411038, in the *Encyclopedia of Mathematical Physics*, Elsevier, 2006.

An Early Step Toward Asymptotic Freedom, letter to Physics Today, September 2005, pp. 15-16.

Solar System Dark Matter, writeup of talk at the LXIV Rencontres de Moriond, Electroweak Session, La Thuile, March 11, 2009, arXiv:0903.4879.

Adler sum rule, arXiv:0905.2923. Invited article for Scholarpedia.

Spacecraft calorimetry as a test of the dark matter scattering model for flyby anomalies, arXiv:0910.1564. White paper submitted to the NAS decadal review on biological and physical sciences in space.

SU(8) Family Unification with Boson-Fermion Balance, in “50 Years of Quarks”, editors: H. Fritzsch and M. Gell-Mann, World Scientific, Singapore, 2015.

Soft Pions and More, arXiv:1901.06445, talk at the Symposium “The Standard Model at 50 Years”, Case Western Reserve University, June 1, 2018 (2019).

Recent Path Crossings with Roman and Anomalies, arXiv:1910.04089, to appear in “Roman Jackiw: 80th Birthday Festschrift”, edited by A. Niemi, T. Tomboulis, & K.K. Phua (World Scientific, 2020).

Reminiscences of Freeman, to appear in the Dyson tribute, in the Monthly Notices of the American Mathematical Society.

GianCarlo Ghirardi: Passing the Torch on Collapse Models, prepared for the volume: “Do Wave Functions Jump? Perspectives on the work of GC Ghirardi”, Editors: V. Allori, A. Bassi, D. Dürr & N. Zanghi; Springer International Publishing.

Journal Articles and arXiv Postings

- Theory of Valence Band Splittings at $k = 0$ in Zincblende and Wurtzite Structures. *Phys. Rev* **126**, 118 (1962).
- A Generalized Ewald Method for Lattice Sums. *Physica* **27**, 1193 (1961).
- Quantum Theory of the Dielectric Constant in Real Solids. *Phys. Rev.* **126**, 413 (1962).
- Theory of the Range of Hot Electrons in Real Metals. *Phys. Rev.* **130**, 1654 (1963).
- Use of the Deuteron to Provide a Polarized Proton Target (with A.S. Goldhaber). *Phys. Rev. Letters* **10**, 448 (1963).
- Polarization Effects in High Energy Weak Interactions. *Nuovo Cimento* **32**, 509 (1964).
- Tests of the Conserved Vector Current and Partially Conserved Axial-Vector Current Hypotheses in High Energy Neutrino Reactions. *Phys. Rev.* **135**, B963 (1964).
- Calculation of the Axial-Vector Coupling Constant Renormalization in Beta Decay. *Phys. Rev. Letters* **14**, 1051 (1965).
- Consistency Conditions on the Strong Interactions Implied by a Partially Conserved Axial Vector Current. *Phys. Rev.* **137**, B1022 (1965); *Phys. Rev.* **139**, B1638 (1965).
- Sum Rules for the Axial-Vector Coupling Constant Renormalization in Beta Decay. *Phys. Rev.* **140**, B736 (1965).
- Commutation Relations of Space and Time Components of Vector and Axial-Vector Currents (with C.G. Callan). CERN preprint (1965) (Unpublished).
- Sum Rules Giving Tests of Local Current Commutation Relations in High Energy Neutrino Reactions. *Phys. Rev.* **143**, 1144 (1966).
- Low-Energy Theorem for the Weak Axial-Vector Vertex (with Y. Dothan), *Phys. Rev.* **151**, 1267 (1966).
- Partially Conserved Axial-Vector Current Restrictions on Pion Photoproduction and Electroproduction Amplitudes (with F.J. Gilman). *Phys. Rev.* **152**, 1460 (1966).
- Neutrino or Electron Energy Needed for Testing Current Commutation Relations (with F.J. Gilman), *Phys. Rev.* **156**, 1598 (1967).
- η Decay, Current Algebra, and the C-Nonconserving Electromagnetic Current, *Phys. Rev. Letters* **18**, 519 (1967).
- Possible Measurement of the Nucleon Axial-Vector Form Factor in Two-Pion Electroproduction Experiments (with W.I. Weisberger), *Phys. Rev.* **169**, 1392 (1968).
- Photo-, Electro- and Weak Single Pion Production in the (3,3)-Resonance Region, *Ann. Phys. (N.Y.)* **50**, 189 (1968).
- Axial-Vector Vertex in Spinor Electrodynamics, *Phys. Rev.* **177**, 2426 (1969).
- Breakdown of Asymptotic Sum Rules in Perturbation Theory (with W.K. Tung), *Phys. Rev. Letters* **22**, 978 (1969).
- Absence of Higher Order Corrections in the Anomalous Axial-Vector Current Divergence Equation (with W.A. Bardeen), *Phys. Rev.* **182**, 1517 (1969).
- Anomalous Commutators and the Triangle Diagram (with D.G. Boulware), *Phys. Rev.* **184**, 1740 (1969).

Bjorken Limit in Perturbation Theory (with W.K. Tung), Phys. Rev. **D1**, 2846 (1970).

Photon Splitting in a Strong Magnetic Field (with J.N. Bahcall, C.G. Callan, and M.N. Rosenbluth), Phys. Rev. Letters **25**, 1061 (1970).

Photon Splitting and Photon Dispersion in a Strong Magnetic Field. Ann. Phys. (N.Y.) **67**, 599 (1971).

Vanishing of the Second-Order Correction to the Triangle Anomaly in Landau-Gauge, Zero Fermion Mass Quantum Electrodynamics (with R.W. Brown, T. F. Wong, and B.-L. Young), Phys. Rev. **D4**, 1787 (1971).

Quantum Electrodynamics Without Photon Self-Energy Parts: An Application of the Callan-Symanzik Scaling Equations (with William A. Bardeen), Phys. Rev. **D4**, 3045 (1971).

Low Energy Theorem for $\gamma + \gamma \pi + \pi + \pi$ (with B.W. Lee, S.B. Treiman and A. Zee), Phys. Rev. **D4**, 3497 (1971).

Three Pion States in the $K_L \rightarrow \mu^+ \mu^-$ Puzzle (with Glennys R. Farrar and S.B. Treiman), Phys. Rev **D5**, 770 (1972).

Short Distance Behavior of Quantum Electrodynamics and an Eigenvalue Condition for α , Phys. Rev. **D5**, 3021 (1972).

Constraints on Anomalies (with C.G. Callan, Jr., D.J. Gross, and R. Jackiw) Phys. Rev. **D6**, 2982 (1972).

Massless, Euclidean Quantum Electrodynamics on the 5-Dimensional Unit Hypersphere, Phys. Rev. **D6**, 3445 (1972).

Massless Electrodynamics on the 5-Dimensional Unit Hypersphere: An Amplitude-Integral Formulation, Phys. Rev. **D8**, 2400 (1973).

$I = \frac{1}{2}$ Contribution to $\nu_\mu + N \rightarrow \nu_\mu + \pi^0$ in the Weinberg Weak Interaction Model, Phys. Rev. **D9**, 229 (1974).

Nuclear Charge Exchange Corrections to Leptonic Pion Production in the (3,3)-Resonance Region (with S. Nussinov and E.A. Paschos), Phys. Rev. **D9**, 2125 (1974).

Pion Charge Exchange Scattering in the (3,3)-Resonance Region in Nuclei with a Neutron Excess, Phys. Rev. **D9**, 2144 (1974).

Massless Electrodynamics in the One Photon-Mode Approximation, Phys. Rev. **D10**, 2399 (1974).

Some Simple Vacuum Polarization Phenomenology: $e^+e^- \rightarrow$ Hadrons: The Muonic-Atom X-Ray Discrepancy and $g_\mu - 2$, Phys. Rev. **D10**, 3714 (1974).

Comments on Proposed Explanations for the Muonic-Atom X-ray Discrepancy (with R.F. Dashen and S.B. Treiman), Phys. Rev. **D10**, 3723 (1974).

Consequences of a Simple Phenomenological V-A Model for Neutral Currents, (with S.F. Tuan), Phys. Rev. **D11**, 129 (1975).

Application of Current Algebra Techniques to Neutral-Current-Induced Threshold Pion Production, Phys. Rev. Lett. **33**, 1511 (1974).

Neutrino Radiation Pressure Arising from a Scalar Weak Neutral Coupling, Phys. Rev. **D11**, 1155 (1975).

Renormalization Constants for Scalar, Pseudoscalar and Tensor Currents, (with E.W. Colglazier, Jr., J.B. Healy, I. Karliner, J. Lieberman, Y-J. Ng, H-S. Tsao), Phys. Rev. **D11**, 3309 (1975).

Application of Current Algebra Techniques to Soft Pion Production by the Weak Neutral Current: V,A Case, Phys. Rev. **D12**, 2644 (1975).

Application of Current Algebra Techniques to Soft Pion Production by the Weak Neutral Current: S,P,T Case, (with E.W. Colglazier, Jr., J.B. Healy, I. Karliner, J. Lieberman, Y-J. Ng, H-S. Tsao), Phys. Rev. **D12**, 3501 (1975).

Application of Current Algebra to Soft Pion Production Induced by the Weak Neutral Current: Second Class V, A Case (with R.F. Dashen, J.B. Healy, I. Karliner, J. Lieberman, Y-J. Ng, H-S. Tsao), Phys. Rev. **D12**, 3522 (1975).

Dimuon Production Associated with a Scalar Intermediate Boson Carrying Dileptonic Quantum Numbers (with J.B. Healy, I. Karliner, J. Lieberman, Y-J. Ng, H-S. Tsao), Phys. Rev. **D12**, 2639 (1975).

Isospin 1/2 Nucleon Resonance Production by a V,A Weak Neutral Current (with I. Karliner, J. Lieberman, Y-J. Ng, H-S. Tsao), Phys. Rev. **D13**, 1216 (1976).

Photon Pairing Instabilities: A Microscopic Origin for Gravitation? (with J. Lieberman, Y-J. Ng, H-S. Tsao), Phys. Rev. **D14**, 359 (1976).

Linearized Hartree Formulation of the Photon Pairing Problem, Phys. Rev. **D14**, 379 (1976). Energy-Momentum-Tensor Trace Anomaly in Spin-1/2 Quantum Electrodynamics, (with A. Duncan, J.C. Collins), Phys. Rev. **D15**, 1712 (1977).

Regularization of the Stress-Energy Tensor for Vector and Scalar Particles Propagating in a General Background Metric (with J. Lieberman, Y-J. Ng), Ann. Phys. **106**, 279 (1977).

Zeros of the Fredholm Determinant for the External Field Problem in Euclidean, Massless Spin-0 and Spin-1/2 Electrodynamics, Phys. Rev. **D16**, 2943 (1977).

Trace Anomaly of the Stress-Energy Tensor for Massless Vector Particles Propagating in a General Background Metric, (with J. Lieberman), Ann. Phys. **113**, 294 (1978).

Classical Algebraic Chromodynamics, Phys. Rev. **D17**, 3212 (1978).

“No-hair” theorems for the Abelian Higgs and Goldstone models, (with R. B. Pearson), Phys. Rev. **D18**, 2798 (1978).

Theory of static quark forces, Phys. Rev. **D18**, 411 (1978).

Classical Quark Statics, Phys. Rev. **D19**, 1168 (1979).

Small Deformations of the Prasad-Sommerfield Solution, Phys. Rev. **D19**, 2997 (1979).

Global Structure of Static Euclidean SU(2) Solutions, Phys. Rev. **D20**, 1386 (1979).

Algebraic Chromodynamics, Phys. Lett. **86B**, 203 (1979).

Integration of Source-Charge Constraints in QCD with Fixed Quark and Antiquark Sources, Phys. Rev. **D20**, 3273 (1979).

Scalar Field Algebraic Chromodynamics, Phys. Rev. **D21**, 550 (1980).

Quaternionic Chromodynamics as a Theory of Composite Quarks and Leptons, Phys. Rev. **D21**, 2903 (1980).

Order-R Vacuum Action Functional in Scalar-Free Unified Theories with Spontaneous Scale Breaking, *Phys. Rev. Lett.* **44**, 1567 (1980).

A Formula for the Induced Gravitational Constant, *Phys. Lett.* **95B**, 241 (1980).

Effective Action Approach to Mean Field Non-Abelian Statics, and a Model for Bag Formation, *Phys. Rev.* **D23**, 2901 (1981).

Over-Relaxation Method for the Monte Carlo Evaluation of the Partition Function for Multiquadratic Actions, *Phys. Rev.* **D23**, 2905 (1981).

Sakharov: Science of a Dissident, Section 3: A Key to Understanding Gravity, *New Scientist* **90**, 277 (1981).

Einstein Gravity as a Symmetry-Breaking Effect in Quantum Field Theory, *Rev. Mod. Phys.* **54**, 729 (1982).

Generalized Bag Models as Mean-Field Approximations to QCD, *Phys. Lett.* **110B**, 302 (1982).

Flux Confinement in the Leading Logarithm Model, (with T. Piran), *Phys. Lett.* **113B**, 405 (1982).

The Heavy Quark Static Potential in the Leading Log and the Leading Log Log Models (with T. Piran), *Phys. Lett.* **117B**, 91 (1982).

Quasi-Abelian Versus Large- N_c Linear Confinement (with H. Neuberger), *Phys. Rev.* **D27**, 1960 (1983).

Short Distance Perturbation Theory for the Leading Logarithm Models, *Nucl. Phys.* **B217**, 381 (1983).

Relaxation Methods for Gauge Field Equilibrium Equations (with T. Piran), *Rev. Mod. Phys.* **56**, 1 (1984).

Chiral Symmetry Breaking in Coulomb Gauge QCD (with A.C. Davis), *Nucl. Phys.* **B244**, 469 (1984).

Quaternionic Quantum Field Theory, *Phys. Rev. Lett.* **55**, 783 (1985).

Quaternionic Quantum Field Theory, *Comm. Math. Phys.* **104**, 611 (1986).

Superweak CP Violation Arising from Underlying Quaternionic Quantum Dynamics, *Phys. Rev. Lett.* **57**, 167 (1986).

Time-Dependent Perturbation Theory for Quaternionic Quantum Mechanics, With Application to CP Violation in K Meson Decays, *Phys. Rev.* **D34**, 1871 (1986).

Predictions of Quaternionic Quantum Mechanics for CP Nonconservation in the B and D Meson Systems (with D-S. Du), *Phys. Rev.* **D35** [Brief Reports] 2252 (1987).

Overrelaxation Algorithms for Lattice Field Theories, *Phys. Rev.* **D37**, 458 (1988).

Family Replication in the Harari-Shupe Composite Model, (unpublished).

Stochastic Algorithm Corresponding to a General Linear Iterative Process, *Phys. Rev. Lett.* **28**, 1243 (1988).

Scattering and Decay Theory for Quaternionic Quantum Mechanics, and the Structure of Induced T Nonconservation, *Phys. Rev.* **D37**, 3654 (1988).

Metropolis Overrelaxation for Lattice Gauge Theory for General Relaxation Parameter ω , *Phys. Rev.* **D38**, 1349 (1988).

Effective Action Model for the Vanishing of the Cosmological Constant, *Phys. Rev. Lett.* **62**, 373 (1989).

Study of an Overrelaxation Method for Gauge Theories (with G. Bhanot), *Phys. Rev. Lett.* **62**, 121 (1989).

A New Embedding of Quantum Electrodynamics in a Non-Abelian Gauge Structure, *Phys. Lett.* **B221**, 39 (1989).

A New Electroweak and Strong Unification Scheme, *Phys. Lett.* **B225**, 143 (1989).

Accelerating Abelian Gauge Dynamics (with G. Bhanot), *Phys. Rev. Lett.* **66**, 1807 (1991).

Complexified Neural Networks, IASSNS-HEP-91/36 (unpublished).

Parallel Acceleration Algorithm for Spin Models (with G. Bhanot), *Int. J. Mod. Phys.* **C3**, 605 (1992).

Defeating Critical Slowing Down for Abelian Gauge Dynamics (with G. Bhanot, T. Lippert, K. Schilling and P. Ueberholz), *Nucl. Phys.* **B368**, 745 (1992).

V Cycle Dynamical Exponent for the Multi-Scale-Update Algorithm for the 2-d XY Model, (with G. Bhanot), *Int. J. Mod. Phys.* **C4**, 947 (1993).

Generalized quantum dynamics, *Nucl. Phys.* **B415**, 195 (1994).

Proof of Jacobi identity in generalized quantum dynamics, *J. Math. Phys.* **35**, 531 (1994).

Algebraic and geometric aspects of generalized quantum dynamics (with Y.-S. Wu), *Phys. Rev.* **D49**, 6705 (1994).

Composite leptons and quarks constructed as triply occupied quasiparticles in quaternionic quantum mechanics, *Phys. Lett.* **B332**, 358 (1994).

Algorithmic Aspects of a Neuron for Coherent Wave Synapse Realizations (with G.V. Bhanot and J.D. Weckel), *IEEE Transactions in Neural Networks* **7**, 1262 (1996).

Generalized Quantum Dynamics as Pre-Quantum Mechanics (with A.C. Millard), *Nucl. Phys.* **B473**, 199 (1996).

General Theory of Image Normalization, cs. CV/9810017 (unpublished).

Projective Group Representations in Quaternionic Hilbert Space, *J. Math. Phys.* **37** (5), 2352 (1996).

Comment on “Photon Splitting in Strongly Magnetized Objects Revisited” IAS astrophysics preprint (unpublished).

Photon Splitting in a Strong Magnetic Field: Recalculation and Comparison With Previous Calculations, (with C. Schubert), *Phys. Rev. Lett.* **77**, 1695 (1996).

Similarity and Affine Normalization of Partially Occluded Planar Curves using First and Second Order Derivatives (with R. Krishnan), *Pattern Recognition* **31**, 1551 (1998).

Microcanonical Ensemble and Algebra of Conserved Generators for Generalized Quantum Dynamics (with L.P. Horwitz), *J. Math. Phys.* **37**, 5429 (1996).

Response to the Comment by G. Emch on Projective Group Representations in Quaternionic Hilbert Space, *J. Math. Phys.* **37** (12), 6586 (1996).

Nonadiabatic Geometric Phase in Quaternionic Hilbert Space (with J. Anandan), *Fdns. of Phys.* **26**, 1579 (1997).

Fermion-Sector Frustrated SU(4) as a Preonic Precursor of the Standard Model, *Int. J. Mod. Phys. A* **14**, 1911 (1999).

Coherent States in Quaternionic Quantum Mechanics (with A. Millard), *J. Math. Phys.* **38**, 2117 (1997).

SU(4) Preonic Interpretation of the HERA Positron-Jet Events, IASSNS-HEP-97/12 (unpublished).

Equilibrium Statistical Ensembles and Structure of the Entropy Functional in Generalized Quantum Dynamics (with L.P. Horwitz), *Int'l. J. Theor. Phys.* **37**, 519 (1998).

The Matrix Model for M Theory as an Exemplar of Trace (or Generalized Quantum) Dynamics, *Phys. Lett. B* **407**, 229 (1997).

Poincaré Supersymmetry Representations Over Trace Class Noncommutative Graded Operator Algebras, *Nucl. Phys. B* **499** [PM], 569 (1997).

A Rejoinder on Quaternionic Projective Representations (with G. Emch), *J. Math. Phys.* **38**, 4758 (1997).

A Strategy for a Vanishing Cosmological Constant in the Presence of Scale Invariance Breaking, *Gen. Rel. & Grav.* **29**, 1357 (1997).

Corrections to the Emergent Canonical Commutation Relations Arising in the Statistical Mechanics of Matrix Models (with A. Kempf), *J. Math. Phys.* **39**, 5083 (1998).

Gauge Fixing in the Partition Function for Generalized Quantum Dynamics, *J. Math. Phys.* **39**, 1723 (1998).

A Model for the Quark Mass and Flavor Mixing Matrices Based on Discrete Chiral Symmetry as the Origin of Families, (unpublished).

Model for Particle Masses, Flavor Mixing, and CP Violation, Based on Spontaneously Broken Discrete Chiral Symmetry as the Origin of Families, *Phys. Rev. D* **59**, 015012 (1999).

Higgs Mass Bounds in the Three- and Six-Higgs Doublet Models for Family Structure, *Phys. Rev. D* **60**, 015002 (1999).

State Vector Collapse Probabilities and Separability of Independent Systems in Hughston's Stochastic Extension of the Schrödinger Equation, (with L.P. Horwitz), IASSNS-HEP-99/36, quant-ph/9904048, unpublished.

Structure and Properties of Hughston's Stochastic Extension of the Schrödinger Equation, (with L.P. Horwitz), *J. Math. Phys.* **41**, 2485 (2000).

Derivation of the Lindblad Generator Structure by Use of the Itô Stochastic Calculus, IASSNS-HEP-99/85, quant-ph/9909076, *Phys. Lett. A* **265**, 58 (2000)

Possible Non-Higgs Symmetry Breaking Phases in Gauge Theories, IASSNS-HEP-99/98, hep-ph/9910561, unpublished.

Lifshitz Phased Gauge Symmetry Breaking and Application to E_6 and E_8 Grand Unification, IASSNS-HEP-00/04, hep-ph/0001079, unpublished.

Scalar Exchange Forces and Generalized Most Attractive Channel Rule, IASSNS-HEP-00/16, hep-ph/0003048, *Phys. Rev. D* **63**:017702 (2001).

The Equilibrium Distribution of Gas Molecules Adsorbed on an Active Surface (with I. Mitra), IASSNS-HEP-00/11, physics/0003002, *Phys. Rev. E* **62**, 4386 (2000), Brief Reports.

Comment on a Proposed Super-Kamiokande Test for Quantum Gravity Induced Decoherence Effects, IASSNS-HEP-00/43, hep-ph/0005220, Phys. Rev. **D62**:117901 (2000).

Completing the Square to Find the Supersymmetric Matter Effective Action Induced by Coupling to Linearized $N = 1$ Supergravity, IASSNS-HEP-00/62, hep-th/0009069, Ann. of Phys. **290**, 11 (2001).

Symmetry Breaking for Matter Coupled to Linearized Supergravity from the Perspective of the Current Supermultiplet, An Essay on Gravitation submitted to the Gravity Research Foundation.

Generalized Stochastic Schrödinger Equations for State Vector Collapse (with T.A. Brun), quant-ph/0103037, J. Phys. A Math. Gen. **34**: 4797 (2001).

Martingale Models for Quantum State Reduction (with D.C. Brody, T.A. Brun and L.P. Hughston), quant-ph/0107153, J. Phys. A: Math. Gen. **34**: 4797 (2001).

Environmental Influence on the Measurement Process in Stochastic Reduction Models, quant-ph/0109029, Journ. Phys. A: Math. Gen. **35**, 841-858 (2002).

Why Decoherence has not Solved the Measurement Problem: A Response to P.W. Anderson, quant-ph/0112095, Studies in History and Philosophy of Modern Physics, **34** 135-142 (2003).

Should E(8) SUSY Yang-Mills be Reconsidered as a Family Unification Model?, hep-ph/0201009, Phys. Lett. **B533**, 121-125 (2003).

Weisskopf-Wigner Decay Theory for the Energy-Driven Stochastic Schrödinger Equation, Phys. Rev. **D67** 025007 (2003).

Further Thoughts on Supersymmetric E_8 as a Family and Grand Unification Theory, hep-ph/0401212.

Global Unitary Fixing and Matrix Valued Correlations in Matrix Models (with L.P. Horwitz), hep-th/0306022, Phys. Lett. **B570**, 73 (2003).

Towards Quantum Superpositions of a Mirror: An Exact Open Systems Analysis (with A. Bassi and E. Ippoliti), quant-ph/0406108, Phys. Rev. Lett. **94**, 030401 (2005).

Towards Quantum Superpositions of a Mirror: An Exact Open Systems Analysis - Computational Details (with A. Bassi and E. Ippoliti), quant-ph/0407084, J. Phys. A: Math Gen. **38**, 2715 (2005).

Stochastic Collapse and Decoherence of a Non-Dissipative Forced Harmonic Oscillator, quant-ph/0411053, J. Phys. A: Math. Gen. **38**, 2729 (2005).

Structure of Fluctuation Terms in the Trace Dynamics Ward Identity, hep-th/0510120, J. Phys. A: Math. Gen. **39**, 1397 (2006).

Notes on the Conway-Kochen Twin Argument, quant-ph/0604122.

Lower and Upper Bounds on CSL Parameters from Latent Image Formation and IGM Heating, quant-ph/0605072, J. Phys. **A40**, 2935, 13501 (2007).

Normalization of Collisional Decoherence: Squaring the Delta Function, and an Independent Cross-Check, quant-ph/0607109, J. Phys. **A39** 14067-14074 (2006).

Comments on Proposed Gravitational Modifications of Schrödinger Dynamics and their Experimental Implications, quant-ph/0610255, J. Phys. **A40** 755-764 (2007).

Vacuum Birefringence in a Rotating Magnetic Field, hep-ph/0611267, J. Phys. A**40** (2007) F143-F152; corrigendum, J. Phys. A: Math. Theor. **41** (2008) 489801.

A density tensor hierarchy for open system dynamics: retrieving the noise, arXiv:0704.0796, J. Phys. A**40**, 8959 (2007).

Evaluation of the Axial Vector Commutator Sum Rule for Pion-Pion Scattering (with F. J. Yndurain), arXiv:0704.1201, Phys. Rev. **D75**, 116002 (2007).

Photon emission rate from atomic systems in the CSL model (with Fethi M. Ramazanoğlu), arXiv:0707.3134, J. Phys. A**40**, 13395 (2007); Erratum: J. Phys. A: Math. Theor. **42** (2009) 10#01.

Collapse models with non-white noises (with Angelo Bassi), arXiv:0708.3624, J. Phys. A**40**, 15083 (2007).

Axions and “Light Shining Through a Wall”: A Detailed Theoretical Analysis (with J. Gamboa, F. Méndez, and J. López-Sarrión), arXiv:0801.4739, Annals of Physics **323**, 11, 2851-2872 (2008).

Planet-bound dark matter and the internal heat of Uranus, Neptune, and hot-Jupiter exoplanets, arXiv:0808.2823, Phys. Lett. **B671**, 203-206 (2009).

Placing direct limits on the mass of earth-bound dark matter, arXiv:0808.0899, J. Phys. A: Math. Theor. **41** (2008) 412002.

Collapse models with non-white noises II: particle-density coupled noises (with Angelo Bassi), arXiv:0807.2846, J. Phys. A: Math. Theor. **41** (2008) 395308.

Can the flyby anomaly be attributed to earth-bound dark matter?, arXiv:0805.2895, Phys. Rev. **D79**, 023505 (2009). Is Quantum Theory Exact? (with Angelo Bassi), arXiv:0912.2211, Science **325**, 275 (2009).

Modeling the flyby anomalies with dark matter scattering, arXiv:0908.2414, Int. J. Mod. Phys. **A25** (2010) 4577-4588.

Parameterized Adaptive Multidimensional Integration Routines (PAMIR): Localization by Repeated 2^p Subdivision, arXiv: 1009.4647 (2010).

Shadow Dark Matter as a Manifestations of $i \leftrightarrow -i$ Symmetry in Pre-Quantum Trace Dynamics, Honorable Mention in the 2013 Gravitation Essay Competition, Int. J. Mod. Phys. **D22**, No. 12, 1342010 (2013).

On spontaneous photon emission in collapse models (with Angelo Bassi and Sandro Donadi), arXiv:1011.3941, J. Phys. A: Math. Theor. **46** (2013) 245304.

Modeling the flyby anomalies with dark matter scattering: update with additional data and further predictions, arXiv:1112.5426, Int. J. Mod. Phys. **A28**, (2013) 1350074.

Incorporating gravity into trace dynamics: the induced gravitational action, arXiv:1306.0482, Class. Quantum Grav. **30**, (2013) 195015, Corrigendum 239501.

Spherically symmetric vacuum solutions arising from trace dynamics modifications to gravitation (with Fethi Ramazanoğlu), arXiv:1308.1448, Int. J. Mod. Phys. **D24**, No. 2, 1550011 (2005).

Gravitation and the noise needed in objective reduction models, arXiv:1401.0353 (2014). Essay for the John Bell anthology being assembled by Mary Bell and Shan Gao.

Where is quantum theory headed?, arXiv:1401.0896, Journal of Physics: Conference Series **504** (2014) 012002.

$SU(8)$ family unification with boson-fermion balance, arXiv:1403.2099, Int. J. Mod. Phys. A**29**, No. 22, 1450130 (2014), also in “50 Years of Quarks”, H. Fritzsch and M. Gell-Mann, eds., World Scientific Press, (2015).

Phases with modular ground states for symmetry breaking by rank 3 and rank 2 antisymmetric tensor scalars, arXiv:1409.1180, Phys. Lett. **B742**, pp. 231-235, (2015).

$SU(n)$ symmetry breaking by rank three and rank two antisymmetric tensor scalars, arXiv:1503.07084, Phys. Lett. **B744**, pp. 380-384, (2015).

Classical and Quantum Gauged Massless Rarita-Schwinger Fields, arXiv:1502.02652 (2015).

Classical Gauged Massless Rarita-Schwinger Fields, arXiv:1508.03380, Phys. Rev. **D92**, 085022 (2015).

Quantized Gauged Massless Rarita-Schwinger Fields, arXiv:1508.03382, Phys. Rev. **D92**, 085023 (2015).

Gravitational Decoherence for Mesoscopic Systems, (with A. Bassi), arXiv:1506.04414, Phys. Lett. **A380**, pp. 390-393, (2016).

Collinearity constraints for on-shell massless particle three-point functions, and implications for allowed- forbidden $n + 1$ -point functions, arXiv:1602.05060, Phys. Rev. D **93**, 065028 (2016).

Coleman-Weinberg symmetry breaking in $SU(8)$ induced by a third rank antisymmetric tensor scalar field, arXiv:1602.05212, J. Phys. A: Math. Theor. **49**, 315401 (2016).

Does the Peres experiment using photons test for hyper-complex (quaternionic) quantum theories?, arXiv:1604.04950, Phys. Rev. A **95**, 060101 (2017).

A frame-dependent gravitational effective action mimics a cosmological constant, but modifies the black hole horizon, arXiv:1605.05217, Int. J. Mod. Phys. **D25**, 1643001 (2016).

Coleman-Weinberg symmetry breaking in $SU(8)$ induced by a third rank antisymmetric tensor scalar field II: the fermion spectrum, arXiv:1606.07477, J. Phys. A: Math. Theor. **49**, 315401 (2016).

Implications of a frame dependent gravitational effective action for perturbations on the Robertson- Walker Metric, arXiv:1704.00388, Int. J. of Mod. Phys. D **26** 1750159 (2017).

Canonical Field Anticommutators in the Extended Gauged Rarita-Schwinger Theory, (with M. Henneaux. P. Pais), arXiv:1708.03588, Phys. Rev. D **96**, 085005 (2017).

Analysis of a gauged model with a spin- $\frac{1}{2}$ field directly coupled to a Rarita-Schwinger spin- $\frac{3}{2}$ field, arXiv:1711.00907, Phys. Rev. D **97**, 045014 (2018).

Minimum Interior Temperature for Solid Objects Implied by Collapse Models, arXiv:1801.06857, (2018).

Heating Through Phonon Excitation Implied by Collapse Models, arXiv:1801.00509, Phys. Rev. A **97**, 052119 (2018).

Bulk Heating Effects as Tests for Collapse Models, (with A. Vinante), arXiv:1801.06857, Phys. Rev. A **97**, 052119 (2018).

Free field structure of the model with a spin- $\frac{3}{2}$ Rarita-Schwinger field directly coupled to a spin- $\frac{1}{2}$ field, arXiv:1807.06146, J. Math Phys. **59**, 102302, (2018).

Connecting the Dots: Mott for Emulsions, Collapse Models, Colored Noise, Frame Dependence of Measurements, Evasion of the “Free Will Theorem”, arXiv:1807-11450, Found. Phys. **48**, 1557, (2018).

Testing Continuous Spontaneous Localization with Fermi liquids, (with A. Bassi, M. Carlesso, A. Vinanti), arXiv:1910.10963, Phys. Rev. **D99**, 103001, (2019).

Chiral Anomaly Calculation in the Extended Coupled Rarita-Schwinger Model, (with P. Pais), arXiv:1903.06189, Phys. Rev. **D99**, 095037, (2019).

Implications of a frame dependent dark energy for the spacetime metric, cosmography, and effective Hubble constant, arXiv:1905.08228, Phys. Rev. **D100**, 123503 (2019).

Analysis of an $SU(8)$ model with a spin- $\frac{1}{2}$ field directly coupled to a gauged Rarita-Schwinger spin- $\frac{3}{2}$ field, arXiv:1911.10607, Int. J. Mod. Phys. **A34**, 1950230 (2019).

Minimum measurement time: lower bound on the frequency cutoff for collapse models, (with A. Bassi, L. Ferialdi), arXiv:1909.11301, J. Phys. A: Math. Theor. **53**, 215302 (2020).

The Continuous Spontaneous Localization Layering Effect from a Lattice Perspective, (with A. Bassi, M. Carlesso), arXiv:1907.11598, Journal of Physics **A 54**, 085303 (2021).

Hubble parameter and related formulas for a Weyl scaling invariant dark energy action, arXiv:2008.07598, International Journal of Modern Physics **D 30**, 21500044 (2021).

Covariance Group for Null Geodesic Expansion Calculations, and its Application to the Apparent Horizon, arXiv:2105.07521 (2021).