

Emilio Santos Corchero

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Publications

- [1. Books](#)
- [2. Research articles in Scientific Journals](#)
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1. Books

"Energía de formación de huecos en la red cristalina del grafito". (Formation energy of vacancies in graphite crystals), Universidad de Valladolid, Secretaría de Publicaciones (1962).

"Einstein: su vida y su obra" (Einstein: his life and work) Aula de Cultura Científica, Universidad de Cantabria , 1982. 34 pages.

"Problemas conceptuales de la Física Cuántica" (Conceptual problems of quantum mechanics), Universidad de Cantabria, 1983, 56 pages .

"El mundo natural según la teoría de la relatividad de Einstein" (The natural world in Einstein's theory of relativity). Ediciones de la Universidad de Cantabria, 2012. 97 pages.

2. Research articles in Scientific Journals

1963

"Formation energy of vacancies in graphite crystals", Proc. Roy. Soc. 274 A, 461-479 (1963). (In collaboration with C. A. Coulson, S. Senent, M.A. Herráez & M.Leal.)

1966

a)"Deformation of graphite lattices by interstitial carbon atoms", Carbon 3, 445-457 (1966). (Col. C.A. Coulson, S. Senent, M.A. Herraez & M.Leal)

b)"An estimation of the correlation energy between two paired electrons", Nuovo Cimento, 45, 87-91 (1966). (Col. M. Leal.)



1967

"Correlated self-consistent field function for two paired electrons", Nuovo Cimento, 51 B, 213-216 (1967).

1968

a)"Deformation of graphite lattices by interstitial C₂ molecules", Carbon, 6, 267-271 (1968). (Col. M. Leal)

b)"Cálculo aproximado de la energía de correlación entre dos electrones" (Approximate calculation of the correlation energy between two electrons), Anales de Física, 64, 177-193 (1968).

c)"Is there an electromagnetic background radiation underlying the quantum phenomena?", Anales de Física, 64, 317-320 (1968).

d)"Solución de las ecuaciones de Einstein-Maxwell para una corriente eléctrica cilíndrica estacionaria" (Solution of the Einstein-Maxwell equations for a stationary cylindrical electric current), Anales de Física, 64, 283-285 (1968).

1969

a)"A Lagrangian formulation of the theory of random motion", Nuovo Cimento, 59 B, 65-81 (1969).

b) "Mathematical foundations of the classical mechanics of systems with infinitely many degrees of freedom", Rev. Mat. Hispano- Americana, 29, 133-147 (1969).

1970

"Corrections for inhomogeneity in the Thomas-Fermi theory of nuclei", Lett. Nuovo Cimento, 3, 469-472 (1970).

1972

a) "On the derivation of the Schrodinger equation from Newtonian mechanics", Phys. Lett. 38 A, 501-502 (1972). (Col. J.A.Alonso & M.Paz Nieto)

b) "Sobre la deducción de la ecuación de Schrodinger a partir de la mecánica clásica " (About the derivation of the Schrodinger equation from classical mechanics) Anales de Física, 68, 137-146 (1972).



c) "Classical interpretation of the uncertainty relations and the old quantum theory", Lett. Nuovo Cimento, 4, 497-501 (1972).

d) "Cálculo de la dilatación producida por vacantes simples en un cristal de grafito", (Calculation of the expansion of graphite crystals by simple vacancies), Anales de Física, 68, 129-163 (1972). (Col. F. Enríquez)

e) "Thomas-Fermi calculation of the interlayer force in graphite", Phys. Rev. B 6, 3134-3141 (1972). (Col. A. Villagrà)

1973

"Límite clásico de la Mecánica Cuántica formulada mediante integración sobre caminos" (Classical limit of quantum mechanics in the path integral formulation), Anales de Física, 69, 287-290 (1973). (Col. M. Paz Nieto)

1974

a) "The harmonic oscillator in stochastic electrodynamics", Nuovo Cimento, 19B, 57-89 (1974).

b) "Foundations of stochastic electrodynamics", Nuovo Cimento, 22 B, 201-214 (1974).

c) "Quantum-like formulation of stochastic problems", J. Math. Phys. 15, 1954-1962 (1974).

d) "Improved first order perturbative calculation of the ground state energy of atoms", J. Chem. Phys., 61, 2471 (1974). (Col. M. Leal)

e) "Método de Hartree-Fock utilizando matrices densidad en representación de coordenadas", (Hartree-Fock using density matrices in the coordinate representation), Anales de Física, 70, 253-256 (1974). (Col. M.G.A. Quintas)

1975

a) "Classical interpretation of commutation rules", Anales de Física, 71, 329-332 (1975).

b) "On the possibility of local hidden-variable theories", Phys. Lett. 53 A , 432 (1975).

c) "Calculation of the expansion in a graphite crystal by Cn interstitials", Carbon 13, 225-231 (1975). (Col. F. Enríquez & M.A.G. Quintas)

d) "Comment on presenting Planck's relation $E = hn$ ", Am. J. Phys., 43, 743 (1975).

1976

"Probabilistic approach to teaching the principles of quantum mechanics", Am. J. Phys. 44, 278-283 (1976).



1977

"Semi statistical model for metals", J. Phys. Chem. Solids, 38 , 307-310 (1977). (Col. J.A. Alonso)

1979

- a) "Path integrals in stochastic electrodynamics", Lett. Nuovo Cimento, 20, 308-312 (1977), 25, 287-288 (1979). (Col. L. Pesquera)
- b) "La correspondencia de Weyl generalizada " (Generalized Weyl correspondence), Revista de la Universidad de Cantabria, nº2, 1193 (1979). (Col. M. Gadella)
- c) "Coupled harmonic oscillators in stochastic electrodynamics", Lett. Nuovo Cimento, 25, 360-364 (1979). (Col. R. Blanco)
- d) "Einstein and the conceptual problems of quantum mechanics", Anales de Fisica, 75, 165-171 (1979).

1981

- a)"Classical relativistic statistical mechanics: The case of a hot dilute plasma", Phys. Rev. D 23, 2181 (1981). (Col. R. Lapiedra)
- b)"A generalized Weyl correspondence : Applications", J. Math. Phys. 22, 1651-1659 (1981). (Col. M. Gadella)

1982

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- b) "Possibilities of an objective interpretation of quantum mechanics", Anales de Física, A 78, 1-6 (1982).
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- a) "Classical dilute relativistic plasma in equilibrium. Two-particle distribution function", Phys. Rev. A 27, 422-430 (1983). (Col. R. Lapiedra)
- b) "Path integrals for non-Markovian processes", Phys. Lett. 94 A, 287-289 (1983). (Col. L. Pesquera & M.A. Rodriguez)
- c) "Equilibrium between radiation and matter for classical relativistic multiperiodic systems. Derivation of Maxwell- Boltzmann distribution from Rayleigh-Jeans spectrum", Phys. Rev. D 27, 1254-1287 (1983). (Col. R. Blanco & L. Pesquera)
- d) "Thermal properties of nuclei in the energy density formalism", Nuovo Cimento 78A, 135-146 (1983). (Col. S. Marcos)
- e) "Equilibrium between radiation and matter for classical relativistic multiperiodic systems. II. Study of radiative equilibrium with Rayleigh-Jeans radiation", Phys. Rev. D 29, 2240-2254 (1983). (Col. R. Blanco & L. Pesquera)
- f) "Local realism has not been refuted by atomic cascade experiments", Phys.Lett. 98A, 5-9 (1983). (Col T.W. Marshall & F. Selleri)
- g) "Collective effects in the atomic-cascade experimental test of Bell inequalities", Lett. Nuovo Cimento 38, 417-420 (1983). (Col. T. W. Marshall & F. Selleri)
- h) "Equation for the potential of an electron system with slowly varying density in the energy-functional formalism", Phys. Rev. A 28, 459-461(1983). (Col. M. Leal)

1984

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- b) "Local realist photon model compatible with Malus's law for experiments testing Bell's inequalities", Phys. Lett. 108 A, 373-376 (1985). (Col. M. Ferrero)
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- d) "A Bell inequality involving position, momentum and energy",
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c) "Dirac's large-number hypothesis revisited", Astron. Astrophys. 164, 1-5 (1986). (Col. A.
Cetto & L. de la Peña)
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1987

- a) "The energy of an inhomogeneous electron gas as a functional of the electric
potential", Europhysics Lett. 3, 169-174 (1987). (Col. A. Mañanes)
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- b) "Relevance of detection efficiency in the optical tests of Bell inequalities", Phys. Lett. A 139, 431-436 (1989).

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- a) "Application of extended Thomas- Fermi theory to the binding of graphite", Il Nuovo Cimento, 12 D, 749-755 (1990). (Col. A.Mañanes)
- b) "Langevin equation for the squeezing of light by means of a parametric oscillator", Phys. Rev. A 41, 1582-86(1990). (Col. T.W.Marshall)
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- e) "Bell's theorem: local realism versus quantum mechanics", Am. J. Phys., 58, 683-688 (1990). (Col. M. Ferrero & T. Marshall).

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- b) "Hidden variables in quantum logic approach reexamined", J.Math.Phys., 32, 1287-1292 (1991). (Col. J. Pykacz)
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- c) "Spontaneous emission in confined space", Phys. Rev. A 45, 6436-6442 (1992). (Col. H. M. Franca & T.W.Marshall).
- d) "The physical meaning of quantization", Found. Phys. 22, 371-379 (1992).
- e) "Possible interference effect in the Stern-Gerlach phenomenon", Phys. Rev. A 46, 2265-2270 (1992). (Col. H. M. Franca, T.W.Marshall & E.J. Watson)
- f) "Critical analysis of the empirical tests of local hidden-variables theories", Phys. Rev. A 46, 3646-3656 (1992)
- g) "Interpretation of quantum optics based upon positive Wigner functions" , Found. Phys. Lett. 5, 573- 578 (1992). (Col. T.W. Marshall)
- h) "Problem of hidden variables", Internat. J. Theor. Phys. 31, 1909-1913 (1992).



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- a) "Spectrum of the electromagnetic radiation stationary in a static gravitational field", Gen. Rel. Grav. 25, 717-720 (1993)
- b) "A phase-space description of the Stern-Gerlach phenomenon", Phys. Lett. A 183, 19-23 (1993). (Col. J. M. Gracia-Bondía & T.W. Marshall)

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- a) "Objectification of classical properties induced by quantum vacuum fluctuations", Phys. Lett. A 188, 198-204 (1994)
- b) "Atomic-cascade experiment with detection of the recoil atom", Europhys. Lett. 27, 181-186 (1994). (Col. S.F. Huelga & M. Ferrero)

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- d) "Constraints for the violation of the Bell inequality in Einstein-Podolsky-Rosen-Bohm experiments", Phys. Lett. A 200, 1-6 (1995)
- e) "Semiclassical treatment of macroscopic quantum relaxation", Anales de Física (Madrid), 91, 49-53 (1995) (Col. T. W. Marshall).



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- a) "Comment on 'Experimental demonstration of the violation of local realism without Bell inequalities' ", Phys. Lett. A 214, 316- 318 (1996). (Col. A. Cabello)
- b) "Temporal Bell-type inequalities for two-level Rydberg atoms coupled to a high-Q resonator", Phys. Rev. A 54, 1798-1807 (1996) (Col. S. F. Huelga &T. W. Marshall)
- c) "Unreliability of performed tests of Bell's inequality using parametric down-converted photons", Phys. Lett. A 212, 10-14 (1996)

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- b) "Effect of perturbing the internal structure in atom interference: The relevance of photon dressing", Phys. Lett. A 228, 232-238 (1997)
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- e) "Fourth order interference in the Wigner representation for parametric downconversion experiments", Phys. Rev. A 55, 3879-3890 (1997) (Col. A. Casado, A. Fernández-Rueda, T. W. Marshall & R. Risco-Delgado)
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- g) "Empirical consequences of the scientific construction: The program of local hidden variables in quantum mechanics", Found. Phys. 27, 765-800 (1997). (Col. M. Ferrero)
- h) "Radiative corrections in the Zeeman effect of 2^3P states of helium", Phys. Rev. A 56, 3576-3582 (1997) (Col. I. Gonzalo)

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- c) "Type II parametric downconversion in the Wigner formalism. Entanglement and Bell's inequalities", J. Opt. Soc. Amer. B 15, 1572-1577 (1998) . (Col. A. Casado & T. W. Marshall)
- d) "Equilibrium of spheres with local anisotropy in post-Newtonian gravity. Application to supermassive stars", Class. Quantum Grav. 15, 3645-3654 (1998)
- e) "White dwarfs with anisotropic pressure in post-Newtonian gravity", Astr.Space Sci. 259, 31-43 (1998).

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- b) "Perturbation of the evolution of a quantum system induced by its environment", Phys. Lett. A, 259, 83-90 (1999). (Col. L. de la Peña)
- c) "Anisotropic velocity distribution in the solar plasma: Solution to the neutrino problem?", Apeiron, 6, 45-54 (1999). (Col. E. Santos Leal)
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2012

- a) "Metric fluctuations, solution to the superluminal neutrino problem?", *arXiv: 1201.2255* (2012).
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3. Chapters of Books and Proceedings



1973

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