

Curriculum Vitae of Germán Sierra

Personal Data

Name : Germán
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Professional data

Organism : Consejo Superior de Investigaciones Cientificas (Spain)
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Academic Career

Graduate in Physics, Univ. Complutense de Madrid, Spain (1978).
PhD in Physics, Univ. Complutense de Madrid, Spain (1981).
Postdoc at l'Ecole Normale Superieure, Paris, France (1981 -1983).
Titular professor at Univ. Complutense de Madrid, Spain (1984 - 1987).
Fellow at CERN, Geneva, Switzerland (1987 - 1989).
Scientific researcher, CSIC, Spain (1989 - 2005).
Full professor, CSIC, Spain (2005 - present).

Scientific interests

Conformal field theory, integrable systems in condensed matter physics and statistical mechanics, topological phases of matter, entanglement, tensor networks, quantum circuits, quantum games, number theory and Physics.

Articles

- [1] "Causality of a wave equation and invariance of its hyperbolicity conditions", A. F. Rañada y G. Sierra, Phys. Rev. **D22** (1980) 385.
- [2] "A theory of the Rarita-Schwinger field without superluminality", A. F. Rañada, G. Sierra, Phys. Rev. **D22** (1980) 2416.
~ Year 1982 ~
- [3] "Classical and Quantum fields with secondary constraints", G. Sierra, Phys.Rev. **D26** (1982) 2730.
~ Year 1983 ~
- [4] "Hyperkahler supersymmetric σ -model in six dimensions", G. Sierra, P. K. Townsend, Phys.Lett. **124B** (1983) 497.
Preprint LPTENS 83/7.
- [5] "Supersymmetry in six dimensions", P. S. Howe, G. Sierra, P. K. Townsend, Nucl.Phys. **B221** (1983) 331.
- [6] "Chiral anomalies and constraints on the gauge group in higher dimensional supersymmetric Yang-Mills theories", P. K. Townsend, G. Sierra, Nucl.Phys. **B222** (1983) 493.

- [7] "Exceptional supergravity theories and the Magic Square", M. Gunaydin, G. Sierra, P. K. Townsend, Phys. Lett. **133B** (1983) 72.
 ~ Year 1984 ~
- [8] "The gauge invariant N=2 supersymmetric σ model with general scalar potential", G. Sierra, P. K. Townsend, Nucl. Phys. **B233** (1984) 289.
- [9] "Quantization of the gauge coupling constant in a five- dimensional Yang-Mills-Einstein supergravity theory", M. Gunaydin, G. Sierra, P. K. Townsend, Phys.Rev.Lett. **53** (1984) 322.
- [10] "The geometry of N=2 Maxwell-Einstein supergravity and Jordan algebras", M. Gunaydin, G. Sierra, P. K. Townsend, Nucl.Phys. **B242** (1984) 244.
- [11] "Vanishing potentials in gauged N=2 supergravity: an application of Jordan algebras", M. Gunaydin, G. Sierra, P. K. Townsend, Phys.Lett. **144B** (1984) 41.
- [12] "Two dimensional supersymmetric non linear σ -models with torsion", P. S. Howe, G. Sierra, Phys.Lett. **148B** (1984) 451.
 ~ Year 1985 ~
- [13] "Gauging the d=5 Maxwell-Einstein supergravity theories: more on Jordan algebras" , M. Gunaydin, G. Sierra, P. K. Townsend, Nucl.Phys. **B253** (1985) 573.
- [14] "Which antisymmetric gauge fields may couple consistently to supergravity", G. Sierra, J. M. Poncela, Phys.Lett. **154B** (1985) 386.
- [15] "Six dimensional simple and extended chiral supergravity in superspace", M. Awada, P. K. Townsend, G. Sierra, Class.and Quantum Gravity **2** (1985) L85.
- [16] "N=2 Maxwell-Matter-Einstein supergravities in d=5,4 and 3", G. Sierra, Phys.Lett. **157B** (1985) 379.
- [17] "Convex cones, Jordan algebras and the geometry of d=9 Maxwell-Einstein supergravity", M. Awada, P. K. Townsend, M. Gunaydin, G. Sierra, Class. and Quantum Gravity **2** (1985) 801.
 ~ Year 1986 ~
- [18] "Causality on the world-sheet of the string", F. Jiménez, J. Ramírez Mittelbrunn, G. Sierra, Phys.Lett. **167B** (1986) 178.
- [19] "Quantum mechanical amplitudes for string propagation", F. Jiménez, J. Ramírez Mittelbrunn, M. Ramon Medrano, G. Sierra, Phys.Lett. **171B** (1986) 369.
- [20] "New local bosonic symmetries of the particle, superparticle and string actions", G. Sierra, Class.and Quantum Gravity **3** (1986) L67.
- [21] "The unitary supermultiplets of d=3 Anti-de-Sitter and d=2 conformal superalgebras", M. Gunaydin, G. Sierra, P. K. Townsend, Nucl.Phys. **B274** (1986) 429.
- [22] "Singletons and Superstrings", M. Gunaydin, B. E. W. Nilsson, G. Sierra, P. K. Townsend, Phys. Lett. **176B** (1986) 45.
- [23] "More on d=5 Maxwell-Einstein supergravity: symmetric spaces and kinks", M. Gunaydin, G. Sierra, P. K. Townsend, Class.and Quantum Gravity **3** (1986) 763.
 ~ Year 1987 ~
- [24] "An application of the theories of Jordan algebras and Freudenthal triple systems to particles and strings", G. Sierra, Class.and Quantum Gravity **4** (1987) 227.
 ~ Year 1988 ~
- [25] "Quenched string field theory", F. Jiménez, G. Sierra, Phys. Lett. **202B** (1988) 58.
- [26] "Fermionic strings in the operator formalism", L. Alvarez-Gaumé, C. Gómez, P. Nelson, G. Sierra, C. Vafa, Nucl.Phys. **B311** (1988) 333.
 ~ Year 1989 ~
- [27] "Quantum group interpretation of some rational conformal field theories", L. Alvarez-Gaumé, C. Gómez, G. Sierra, Phys. Lett. **220B** (1989) 142.
- [28] "Hidden quantum symmetries in rational conformal field theories", L. Alvarez-Gaumé, C. Gómez, G. Sierra, Nucl.Phys. **B319** (1989) 155.
 ~ Year 1990 ~
- [29] "Duality and quantum groups", L. Alvarez-Gaumé, C. Gómez, G. Sierra, Nucl.Phys. **B330** (1990) 347.
- [30] "Quantum group meaning of the Coulomb gas", C. Gómez, G. Sierra, Phys. Lett. **240B** (1990) 149.
 ~ Year 1991 ~
- [31] "Integrability and uniformization in Liouville theory: the geometrical origin of the quantized symmetries", C. Gómez, G. Sierra, Phys. Lett. **255B** (1991) 51.
- [32] "The quantum symmetry of rational conformal field theories", C. Gómez, G. Sierra, Nucl.Phys. **B352** (1991) 791.
- [33] "Towers of algebras in Rational Conformal Field Theories", C. Gómez, G. Sierra, Inter. Jour. Mod. Phys. **A6** (1991) 2045.
- [34] "New R-matrices associated with finite dimensional representations of $U_q(sl(1))$ at roots of unit", C. Gómez, M. Ruiz-

Altaba, G. Sierra, Phys. Lett. **265B** (1991) 95.

~ Year 1992 ~

- [35] "A new solution to the star-triangle equation based on $U_q(Sl(2))$ at roots of unity", C. Gómez, G. Sierra, Nucl.Phys. **B373** (1992) 761; hep-th/9108017.
- [36] "New integrable deformations of higher spin Heisenberg-Ising chains", C. Gómez, G. Sierra, Phys. Lett. **285B** (1992) 126; hep-th/9203035.
- [37] "On a new class of integrable models", A. Berkovich, C. Gómez, G. Sierra, Intern. Jour. Mod. Phys. **B6** (1992) 1939; hep-th/9202091.

~ Year 1993 ~

- [38] "On integrable quantum group invariant antiferromagnets", R. Cuerno, C. Gómez y G. Sierra, Journal of Geometry and Physics, **11** (1993) 453; hep-th/9205109.
- [39] "q-Magnetism at roots of unity", A. Berkovich, C. Gómez, G. Sierra, J. Phys. A: Math. Gen. **26** (1993) L45; hep-th/9206001.
- [40] "Quantum harmonic oscillator algebra and link invariants", C. Gómez, G. Sierra, Jour. of Math. Phys. **34**, 2119 (1993); hep-th/9111005.
- [41] "The hidden quantum group of the eight-vertex free fermion model: q -Clifford algebras", R. Cuerno, C. Gómez, E. López, G. Sierra, Phys. Lett. **307B** (1993) 56; hep-th/9302089.
- [42] "On the integrability of N=2 Landau-Ginzburg models: A graph generalization of the Yang-Baxter equation", C. Gómez, G. Sierra, Phys. Lett. **319B** (1993) 125; hep-th/9309007.

~ Year 1994 ~

- [43] "Spin-anisotropy commensurable chains: quantum group symmetries and N=2 SUSY", A. Berkovich, C. Gómez, G. Sierra, Nucl.Phys. **B415** (1994) 681; hep-th/9302001.
- [44] "On the integrability of N=2 supersymmetric massive theories", C. Gómez, G. Sierra, Nucl.Phys. **B419** (1994) 589; hep-th/9312032.

~ Year 1995 ~

- [45] "Perturbative-variational approach to quantum lattice Hamiltonians", J. Garcia-Esteve, G. Sierra, Phys. Rev. **B51** (1995) 8928; cond-mat/9409098.
- [46] "The role of boundary conditions in the Real Space Renormalization Group", M.A. Martín-Delgado, G. Sierra, Phys. Lett. **364B** (1995) 41; cond-mat/9509055.

~ Year 1996 ~

- [47] "Fokker-Planck approach to quantum lattice Hamiltonians", F. Jiménez, G. Sierra, Nucl. Phys. **B458** (1996) 640; cond-mat/9504012.
- [48] "Real Space Renormalization Group Methods and Quantum Groups", M.A. Martín-Delgado, G. Sierra, Phys. Rev. Lett. **76** (1996) 1146; cond-mat/9507115.
- [49] "Analytic Formulations of the Density Matrix Renormalization Group", M.A. Martín-Delgado, G. Sierra, Int. J. Mod. Phys. **A11** (1996) 3145; cond-mat/9511083.
- [50] "The non-linear sigma model and spin ladders", G. Sierra, J. of Phys. A: Math. and General **29**, 3299 (1996); cond-mat 9512007.
- [51] "The Correlated Block Renormalization Group", M.A. Martín-Delgado, J. Rodriguez-Laguna, G. Sierra, Nucl.Phys. **B473** (1996) 685; cond-mat/9512130.
- [52] "Phase Transitions in Staggered Spin Ladders", M.A. Martín-Delgado, R. Shankar, G. Sierra, Phys. Rev. Lett. **77**, 3443 (1996); cond-mat/9605035.

~ Year 1997 ~

- [53] "Real Space Renormalization Group 2D Antiferromagnetic Heisenberg Model", G. Sierra, M.A. Martín-Delgado, Phys. Lett. **391B** (1997) 381; cond-mat/9601121.
- [54] "Low-Energy properties of Antiferromagnetic Spin-1/2 Heisenberg Ladders with an Odd Number of Legs", B. Frischmuth, S. Haas, G. Sierra, T.M.Rice, Phys. Rev. **B55**, R3340 (1997); cond-mat/9606183.
- [55] "An interpolating Ansatz for the Ground State of the Spinless Fermion Hamiltonian in D=1 and 2", M.A. Martín-Delgado, G. Sierra, Int. J. Mod. Phys. **B11**, 1545 (1997); cond-mat/9503085.
- [56] "The Density Matrix Renormalization Group Method applied to Interaction Round a Face Hamiltonians", G. Sierra, T. Nishino, Nucl. Phys. **B495** (1997) 505; cond-mat/9610221.
- [57] "Short-range resonating-valence-bond state of even-spin ladder: A recurrent variational approach", G. Sierra, M.A. Martín-Delgado, Phys. Rev. **B56**, 8774 (1997); cond-mat/9704212.

~ Year 1998 ~

- [58] "Dualities in Spin Ladders", G. Sierra, M.A. Martín-Delgado, J. of Phys. A: Math and Gen. **31**, 1657 (1998); cond-mat/9706104.

- [59] “Dimer-hole-RVB state of the two-leg ladder: A recurrent variational ansatz”, G. Sierra, M.A. Martín-Delgado, J. Dukelsky, S. R. White, D. J. Scalapino, Phys. Rev. **B57**, 11666 (1998); cond-mat/9707335.
- [60] “Equivalence of the Variational Matrix Product Ansatz Method and the Density Matrix Renormalization Group”, J. Dukelsky, M.A. Martín-Delgado, T. Nishino, G. Sierra, Europhysics Lett. **43**, 457 (1998); cond-mat/9710310.
- [61] “The Matrix Product Approach to Quantum Spin Ladders”, J.M. Román, G. Sierra, J. Dukelsky, M. A. Martín-Delgado, J. of Phys. A: Math and Gen. **31**, 9729 (1998); cond-mat/9802150.
- [62] “Phase Diagram of the 2-Leg Heisenberg Ladder with Alternating Dimerization”, M. A. Martín-Delgado, J. Dukelsky, G. Sierra, Phys. Lett. **250A**, 430 (1998); cond-mat/9810379.
- ~ Year 1999 ~
- [63] “Diagonal Ladders: A Class of Models for Strongly Correlated Electron Systems”, G. Sierra, M.A. Martín-Delgado, S.R. White, D.J. Scalapino, J. Dukelsky, Phys. Rev. **B59**, 7973 (1999); cond-mat/9806251.
- [64] “Density Matrix Renormalization Group Study of Ultrasmall Superconducting Grains”, J. Dukelsky, G. Sierra, Phys. Rev. Lett. **83**, 172 (1999); cond-mat/9903332.
- [65] “A Density Matrix Renormalization Group Approach to a Model with Asymptotic Freedom and Bound States”, M.A. Martín-Delgado, G. Sierra, Phys. Rev. Lett. **83**, 1514 (1999); hep-th/9903188.
- [66] “The Density Matrix Renormalization Group Applied to single particle Quantum Mechanics”, M.A. Martín-Delgado, G. Sierra, R. Noack J. of Phys. A: Math and Gen. **32**, 6079 (1999); cond-mat/9903100.
- [67] “Recurrent Variational Approach to the Two-Leg Hubbard Ladder”, E.H. Kim, G. Sierra, Daniel Duffy, Phys. Rev. **B60**, 5169 (1999); cond-mat/9902107.
- [68] “Dimer-resonating valence bond state of the four-leg Heisenberg ladder: Interference among resonances”, M. Roncaglia, G. Sierra, M. A. Martín-Delgado, Phys. Rev. **B 60**, 12134 (2000); cond-mat/9904286.
- ~ Year 2000 ~
- [69] “Matrix Product Approach to Conjugated Polymers”, M. A. Martín-Delgado, G. Sierra, S. Pleutin, E. Jeckelmann, Phys. Rev. **B61**, 1841 (2000); cond-mat/9908066.
- [70] “Conformal field theory and the exact solution of the BCS Hamiltonian”, G. Sierra, Nucl. Phys. **B572** (2000) 517; hep-th/9911078.
- [71] “Crossover from the Bulk to few-electron limit in ultrasmall metallic grains”, J. Dukelsky, G. Sierra, Phys. Rev. **B61**, 12302 (2000); cond-mat/9906166.
- [72] “Exact Study of the Effect of Level Statistics in Ultrasmall Superconducting Grains”, G. Sierra, J. Dukelsky, G. G. Dussel, J. von Delft, F. Braun, Phys. Rev. **B61**, 11890 (2000); cond-mat/9909015.
- ~ Year 2001 ~
- [73] “Single-Block Renormalization Group: Quantum Mechanical Problems”, M.A. Martín-Delgado, J. Rodriguez-Laguna, G. Sierra, Nucl. Phys. **B601** (2001) 569; cond-mat/0009474.
- [74] “Stripe ansätze from Exactly Solved Models”, M.A. Martín-Delgado, M. Roncaglia, G. Sierra, Phys. Rev. **B64**, 75117 (2001); cond-mat/0101458.
- [75] “Absence of weak localization in two-dimensional disordered Frenkel lattices”, A. Rodriguez, M. A. Martín-Delgado, J. Rodriguez-Laguna, G. Sierra, V. A. Malyshev, F. Dominguez-Adame, J. P. Lemaistre, J. Lumin. **94** 359 (2001); cond-mat/0201535.
- ~ Year 2002 ~
- [76] “Chern-Simons theory and BCS superconductivity”, M. Asorey, F. Falceto, G. Sierra, Nucl.Phys. **B622** (2002) 593; hep-th/0110266.
- [77] “Density-matrix renormalization-group study of excitons in dendrimers”, M.A. Martín-Delgado, J. Rodriguez-Laguna, G. Sierra, Phys. Rev. **B 65**, 155116 (2002); cond-mat/0012382.
- [78] “Large N limit of the exactly solvable BCS model: analytics versus numerics”, J.M. Román, G. Sierra, J. Dukelsky, Nucl. Phys. **B634** (2002) 483; cond-mat/0202070.
- ~ Year 2003 ~
- [79] Reply to the Comment by P. McCulloch and M. Gulacsi on ”Equivalence of the variational matrix product method and the density matrix renormalization group applied to spin chains” J. Dukelsky, M.A. Martín-Delgado, T. Nishino, T. Wada, G. Sierra, EuroPhysics Letters, **61**, 140 (2003) 2003.
- [80] “Anderson transition in low-dimensional disordered systems driven by nonrandom long-range hopping”, A. Rodriguez, V. A. Malyshev, G. Sierra, M. A. Martín-Delgado, J. Rodriguez-Laguna, F. Dominguez-Adame, Phys. Rev. Lett. **90**, 27404 (2003); cond-mat/0204496.
- [81] “Renormalization Group study of the Sliding Luttinger liquids”, G. Sierra, E.H. Kim, J. of Phys. A, Math and Gen. **36** L37 (2003); cond-mat/0103356.
- [82] “Elementary excitations of the BCS model in the canonical ensemble”, J.M. Román, G. Sierra, J. Dukelsky, Phys. Rev. **B 67**, 64510 (2003); cond-mat/0207640.
- [83] Comment on “Polynomial-Time Simulation of Pairing Models on a Quantum Computer”, J. Dukelsky, J. M. Román, G. Sierra, Phys. Rev. Lett. **90** 249803 (2003); quant-ph/0305139.

- [84] "Russian Doll Renormalization Group, Kosterlitz-Thouless Flows, and the Cyclic sine-Gordon model", A. LeClair, J.M. Román, G. Sierra; Nucl. Phys. **B675** (2003) 584; hep-th/0301042.
 ~ Year 2004 ~
- [85] "The Russian-Doll Renormalization Group and Superconductivity", A. LeClair, J.M. Román, G. Sierra; Phys. Rev. **B69** (2004) 20505; cond-mat/0211338.
- [86] "Exactly solvable Richardson-Gaudin models for many-body quantum systems", J. Dukelsky, S. Pittel, G. Sierra, Rev. Mod. Phys. **76** (2004) 643-662; nucl-th/0405011.
- [87] "Renormalization group limit-cycles and field theories for elliptic S-matrices", A. LeClair, G. Sierra; J. Stat. Mech.(2004) P08004; hep-th/0403178.
- [88] "Log-periodic behaviour of finite size effects in field theory models with cyclic renormalization group", A. LeClair, J.M. Román, G. Sierra; Nucl. Phys. B **700** [FS] (2004) 407; hep-th/0312141.
- [89] "Kondo Effect in Carbon Nanotube Single-Electron Transistors", E.H. Kim, G. Sierra, C. Kallin; J. Phys.: Cond Matt **16**, 749 (2004). cond-mat/0202387.
 ~ Year 2005 ~
- [90] "Universality Classes of Diagonal Quantum Spin Ladders". M.A. Martin-Delgado, J. Rodriguez-Laguna, G. Sierra. Phys. Rev. **B 72**, 104435 (2005); cond-mat/0411132.
- [91] "The elementary excitations of the exactly solvable Russian doll BCS model of superconductivity", A. Anfossi, A. LeClair, G. Sierra, J. Stat. Mech. (2005) P05011; cond-mat/0503014.
- [92] "Finite size effects in ferromagnetic spin chains and quantum corrections to classical strings", Rafael Hernandez, Esperanza Lopez, Africa Perianez, German Sierra, JHEP 0506 (2005) 011; hep-th/0502188.
- [93] "The Riemann zeros and the cyclic renormalization group", G. Sierra, J. Stat. Mech.: Theor. Exp. (2005) P12006; math.NT/0510572.
 ~ Year 2007 ~
- [94] "H = x p with interaction and the Riemann zeros", G. Sierra; Nucl. Phys. B **776** (2007) 327. math-ph/0702034.
- [95] "On the Quantum Reconstruction of the Riemann zeros", G. Sierra, J. Phys. A: Math. Theor. **41** No 30 (2008) 304041. Special Issue: Quantum Theory and Symmetries, including papers from QTS5, 'The 5th International Symposium on Quantum Theory and Symmetries' 28 July 2007, University of Valladolid, Spain.
- [96] "Density-matrix renormalization group study of the bond-alternating S=1/2 Heisenberg ladder with ferro-antiferromagnetic couplings" J. Almeida, M.A. Martin-Delgado, G. Sierra Phys. Rev. B **76** (2007) 184428 ; arXiv:0704.2181.
- [97] "Critical Lines and Massive Phases in Quantum Spin Ladders with Dimerization" J. Almeida, M.A. Martin-Delgado, G. Sierra Phys. Rev. B **77**, 094415 (2008), arXiv:0707.4452
- [98] "A quantum mechanical model of the Riemann zeros", G. Sierra, New J. Phys. **10** (2008) 033016; arXiv:0712.0705
 ~ Year 2008 ~
- [99] "Twisted Order Parameter applied to Dimerized Ladders", J. Almeida, M. A. Martin-Delgado, G. Sierra, J. of Physics A Math and Theor. **41**, 485301 (2008); arXiv:0802.0576.
- [100] "Landau levels and Riemann zeros" G. Sierra, P. K. Townsend, Phys. Rev. Lett. **101**, 110201 (2008); arXiv:0805.4079
- [101] "An exactly solvable pairing model with p-wave symmetry", M. Ibanez, J. Links, G. Sierra and Shao-You Zhao, Phys. Rev. B **79**, 180501(R) (2009), arXiv:0810.0340
- [102] "VBS State Induced by Impurity Frustration in Cr8Ni", J. Almeida, M.A. Martin-Delgado, G. Sierra, Phys. Rev. B, **79**, 115141 (2009), arXiv:0810.2290
- [103] "Self-replicating functions and the renormalization group". J. Rodriguez-Laguna, G. Sierra, arXiv:0809.3694
- [104] "Entanglement entropy of integer Quantum Hall states", Ivan D. Rodriguez, G. Sierra, Phys. Rev. B **80**, 153303 (2009), arXiv:0811.2188.
 ~ Year 2009 ~
- [105] "Entanglement in Far From Equilibrium Stationary States", F. C. Alcaraz, V. Rittenberg, G. Sierra, Phys. Rev. E **80**, 030102(R) (2009), arXiv:0905.0211
- [106] "Infinite matrix product states, Conformal Field Theory and the Haldane-Shastry model" J. I. Cirac and G. Sierra, Phys. Rev. B **81**, 104431 (2010); arXiv:0911.3029.
 ~ Year 2010 ~
- [107] "Exact solution of the p+ip pairing Hamiltonian and a hierarchy of integrable models" C. Dunning, M. Ibanez, J. Links, G. Sierra, S.-Y. Zhao, J. Stat. Mech. (2010) P08025; arXiv:1001.1591
- [108] "Entanglement entropy of integer Quantum Hall states in polygonal domains", I. D. Rodriguez and G. Sierra, J. Stat. Mech. (2010) P12033; arXiv:1007.5356
- [109] "Chiral correlators of the Ising conformal field theory" , E. Ardonne, G. Sierra; J. Phys. A. **43**, 505402 (2010), IOPSelect; arXiv:1008.2863.
 ~ Year 2011 ~

- [110] "Violation of the area law and long range correlations in infinite matrix product states", Anne E. B. Nielsen, German Sierra, J. Ignacio Cirac, Phys. Rev. A **83**, 053807 (2011); arXiv:1103.2205.
- [111] "Entanglement of low-energy excitations in Conformal Field Theory" F. C. Alcaraz, M. Ibanez Berganza and G. Sierra, Phys. Rev. Lett. **106**, 201601 (2011); arXiv:1101.2881
- [112] "The H= xp model revisited and the Riemann zeros", G. Sierra, J. Rodriguez-Laguna, Phys. Rev. Lett. **106**, 200201 (2011); arXiv:1102.5356.
- [113] "Quantum spin Hamiltonians for the $SU(2)_k$ WZW model" A. E. B. Nielsen, J. I. Cirac, G. Sierra, J. Stat. Mech. P11014 (2011), arXiv:1109.5470.
- [114] "Entanglement of excited states in critical spin chains", M. Ibanez Berganza, F. C. Alcaraz, G. Sierra, J. Stat. Mech. P01016 (2012); arXiv:1109.5673.
- [115] "General covariant xp models and the Riemann zeros", G. Sierra, J. Phys. A: Math. Theor. **45** 055209 (2012);
- [116] "Qubism: self-similar visualization of many-body wavefunctions", J. Rodriguez-Laguna, P. Migdal, M. Ibanez Berganza, M. Lewenstein, G. Sierra, New J. Phys. **14** 053028 (2012); arXiv:1112.3560.
- ~ Year 2012 ~
- [117] "Laughlin spin liquid states on lattices obtained from conformal field theory", A. E. B. Nielsen, J. I. Cirac, G. Sierra, Phys. Rev. Lett. **108**, 257206 (2012); arXiv:1201.3096.
- [118] "An xp model on AdS_2 spacetime"; Javier Molina-Vilaplana, German Sierra; Nuclear Physics B **877**, 107 (2013), arXiv:1212.2436.
- ~ Year 2013 ~
- [119] "Truncated Conformal Space Approach for Perturbed Wess-Zumino-Witten $SU(2)_k$ Models", M. Beria, G. P. Brandino, L. Lepori, R. M. Konik, G. Sierra; Nucl. Phys. B **877** [FS] 457 (2013); arXiv:1301.0084.
- [120] "Entanglement Entropies in Conformal Systems with Boundaries", L. Taddia, J. C. Xavier, F. C. Alcaraz, G. Sierra, Phys. Rev. B **88**, 075112 (2013); arXiv:1302.6222.
- [121] "Quantum Computation of Prime Number Functions", Jose Ignacio Latorre, German Sierra; Quantum Information and Computation, Vol. 14, 0577 (2014); arXiv:1302.6245.
- [122] "Fractional quantum Hall states in lattices: Local models and physical implementation", Anne E. B. Nielsen, Germán Sierra, J. Ignacio Cirac; Nature Communications **4**, 2864 (2013); arXiv:1304.0717.
- [123] "Energy space entanglement spectrum of pairing models with s-wave and p-wave symmetry", Javier Rodríguez-Laguna, Miguel Ibáñez Berganza, Germán Sierra; Phys. Rev. B **90**, 041103 (2014), arXiv:1307.8363.
- [124] "Lattice Laughlin States of Bosons and Fermions at Filling Fractions $1/q$ ", Hong-Hao Tu, Anne E. B. Nielsen, J. Ignacio Cirac, Germán Sierra; New J. Phys. **16**, 033025 (2014); arXiv:1311.3958.
- [125] "Optical lattice implementation scheme of a bosonic topological model with fermionic atoms" Anne E. B. Nielsen, Germán Sierra, J. Ignacio Cirac; Phys. Rev. A **90**, 013606 (2014) arXiv:1311.7684.
- [126] "Bosonic fractional quantum Hall states on the torus from conformal field theory", Anne E. B. Nielsen, German Sierra; J. Stat. Mech. (2014) P04007; arXiv:1312.5134.
- ~ Year 2014 ~
- [127] "Entanglement in low-energy states of the random-hopping model", Giovanni Ramirez, Javier Rodriguez-Laguna, German Sierra; J. Stat. Mech. (2014) P07003; arXiv:1402.5015.
- [128] "There is entanglement in the primes" Jose Ignacio Latorre, German Sierra; Quantum Information and Computation, Vol. 15, 0622 (2015). arXiv:1403.4765.
- [129] "The Riemann zeros as energy levels of a Dirac fermion in a potential built from the prime numbers in Rindler spacetime", German Sierra, J. Phys. A: Math. Theor. **47**, 325204 (2014); **IOP Select.** arXiv:1404.4252.
- [130] "Quantum spin models for the $SU(n)_1$ Wess-Zumino-Witten model", Hong-Hao Tu, Anne E. B. Nielsen, German Sierra; Nucl. Phys. B **886**, 328 (2014) arXiv:1405.2950.
- [131] "Construction of spin models displaying quantum criticality from quantum field theory", Ivan Glasser, J. Ignacio Cirac, German Sierra, Anne E. B. Nielsen; Nucl. Phys. B **886**, 63 (2014); arXiv:1405.4135.
- [132] "From conformal to volume-law for the entanglement entropy in exponentially deformed critical spin 1/2 chains", Giovanni Ramirez, Javier Rodriguez-Laguna, German Sierra; J. Stat. Mech. (2014) P10004; arXiv:1407.3456.
- [133] "Finding zeros of the Riemann zeta function by periodic driving of cold atoms", C.E. Creffield, G. Sierra, Phys. Rev. A **91**, 063608 (2015); arXiv:1411.0459.
- ~ Year 2015 ~
- [134] "Excited States in Spin Chains from Conformal Blocks", Benedikt Herwerth, Germán Sierra, Hong-Hao Tu, Anne E. B. Nielsen, Phys. Rev. B **91**, 235121 (2015); arXiv:1501.07557.
- [135] "Holographic codes", José I. Latorre, Germán Sierra, arXiv:1502.06618
- [136] "Entanglement over the rainbow", Giovanni Ramírez, Javier Rodríguez-Laguna, Germán Sierra, J. Stat. Mech. P06002 (2015); arXiv:1503.02695.
- [137] "Infinite matrix product states, boundary conformal field theory, and the open Haldane-Shastry model", Hong-Hao Tu, German Sierra; Phys. Rev. B **92**, 041119(R) (2015); arXiv:1504.07224.
- [138] "Exact parent Hamiltonians of bosonic and fermionic Moore-Read states on lattices and local models", Ivan Glasser, J.

Ignacio Cirac, Germán Sierra, Anne E. B. Nielsen, *New J. Phys.* **17**, 082001 (2015); arXiv:1505.04998.

- [139] "Edge states for the Kalmeyer-Laughlin wave function", Benedikt Herwerth, Germán Sierra, Hong-Hao Tu, J. Ignacio Cirac, Anne E. B. Nielsen, *Phys. Rev. B* **92**, 245111 (2015); arXiv:1509.02147.

~ Year 2016 ~

- [140] "Boson Condensation in Topologically Ordered Quantum Liquids", Titus Neupert, Huan He, Curt von Keyserlingk, Germán Sierra, B. Andrei Bernevig; *Phys. Rev. B* **93**, 115103 (2016); arXiv:1601.01320.
- [141] "The Riemann zeros as spectrum and the Riemann hypothesis" Germán Sierra; *Symmetry* 2019, **11**(4), 494. arXiv:1601.01797.
- [142] "Entanglement in correlated random spin chains, RNA folding and kinetic roughening", Javier Rodríguez-Laguna, Silvia N. Santalla, Giovanni Ramírez, Germán Sierra. *New J. Phys.* **18**, 073025 (2016); arXiv:1601.03408.
- [143] "Fourier-space entanglement of spin chains", Miguel Ibáñez-Berganza, Javier Rodríguez-Laguna, Germán Sierra; *J. Stat. Mech.: Th. and Exp.* **5**, 052112 (2016); arXiv:1602.04224.
- [144] "No-Go Theorem for Boson Condensation in Topologically Ordered Quantum Liquids", Titus Neupert, Huan He, Curt von Keyserlingk, German Sierra, B. Andrei Bernevig, *New J. Phys.* **18**, 123009 (2016). arXiv:1607.06457.
- [145] "Lattice effects on Laughlin wave functions and parent Hamiltonians", Ivan Glasser, J. Ignacio Cirac, Germán Sierra, Anne E. B. Nielsen, *Phys. Rev. B* **94**, 245104 (2016); arXiv:1609.02435.
- [146] "A field theory route towards critical spin chains", Germán Sierra, *J. Phys. A: Math. Theor.* **49**, 491001 (2016).
- [147] "Long-range Heisenberg models in quasi-periodically driven crystals of trapped ions", A. Bermudez, L. Tagliacozzo, G. Sierra and P. Richerme, *Phys. Rev. B* **95**, 024431 (2017); arXiv:1607.03337.
- [148] "Many-body Lattice Wavefunctions From Conformal Blocks", Sebastian Montes, Javier Rodríguez-Laguna, Hong-Hao Tu, Germán Sierra, *Phys. Rev. B* **95**, 085146 (2017); arXiv:1609.05217.
- [149] "More on the rainbow chain: entanglement, space-time geometry and thermal states", Javier Rodríguez-Laguna, Jérôme Dubail, Giovanni Ramírez, Pasquale Calabrese, Germán Sierra, *J. Phys. A: Math. Theor.* **50**, 164001 (2017); arXiv:1611.08559.

~ Year 2017 ~

- [150] "Effective description of correlations for states obtained from conformal field theory", Benedikt Herwerth, Germán Sierra, J. Ignacio Cirac, Anne E. B. Nielsen, *Phys. Rev. B* **96**, 115139 (2017); arXiv:1706.03574.
- [151] "The BCS wave function, matrix product states, and the Ising conformal field theory", Sebastian Montes, Javier Rodríguez-Laguna, Germán Sierra; *Phys. Rev. B* **96**, 195152 (2017); arXiv:1709.01979.
- [152] "Tachyonic quench in a free bosonic field theory", Sebastian Montes, Javier Rodríguez-Laguna, Germán Sierra, *J. Stat. Mech.* (2018) 023102; arXiv:1711.01326.
- [153] "Entanglement hamiltonian and entanglement contour in inhomogeneous 1D critical systems", Erik Tonni, Javier Rodríguez-Laguna, Germán Sierra, *J. Stat. Mech.* (2018) 043105; arXiv:1712.03557.
- [154] "Five Experimental Tests on the 5-Qubit IBM Quantum Computer", Diego Garca-Martín, Germán Sierra, *Journal of Applied Mathematics and Physics*, **6**, 1460 (2018); arXiv:1712.05642.

~ Year 2018 ~

- [155] "Multipartite entanglement in spin chains and the Hyperdeterminant", Alba Cervera-Lierta, Albert Gasull, José Ignacio Latorre, German Sierra, *J. Phys. A: Math. Theor.* **51**, 505301 (2018). arXiv:1802.02596.
- [156] "Equipartition of the Entanglement Entropy", J. C. Xavier, F. C. Alcaraz, G. Sierra; *Phys. Rev. B* **98**, 041106 (2018) arXiv:1804.06357.
- [157] "Bosonic Gaussian states from conformal field theory", Benedikt Herwerth, Germán Sierra, J. Ignacio Cirac, Anne E. B. Nielsen, *Phys. Rev. B* **98**, 115156 (2018); arXiv:1807.01943.
- [158] "Unusual area-law violation in random inhomogeneous systems", Vincenzo Alba, Silvia N. Santalla, Paola Ruggiero, Javier Rodriguez-Laguna, Pasquale Calabrese, German Sierra, *J. Stat. Mech.* (2019) 023105; arXiv:1807.04179.
- [159] "Non-Abelian quasiholes in lattice Moore-Read states and parent Hamiltonians", Sourav Manna, Julia Wildeboer, Germán Sierra, Anne E. B. Nielsen; *Phys. Rev. B* **98**, 165147 (2018); arXiv:1807.11222.
- [160] "Symmetry protected phases in inhomogeneous spin chains". Nadir Samos Sáenz de Buruaga, Silvia N. Santalla, Javier Rodríguez-Laguna, Germán Sierra; *J. Stat. Mech.* (2019) 093102; arXiv:1812.04869.
- [161] "Renormalization group flows for Wilson-Hubbard matter and the topological Hamiltonian", E. Tirrito, M. Rizzi, G. Sierra, M. Lewenstein, A. Bermudez *Phys. Rev. B* **99**, 125106 (2019); arXiv:1812.05973.

~ Year 2019 ~

- [162] "Tensor renormalization group in bosonic field theory", Manuel Campos, German Sierra, Esperanza Lopez. *Phys. Rev. B* **100**, 195106 (2019); arXiv:1902.02362.
- [163] "Integrable Floquet Hamiltonian for a Periodically Tilted 1D Gas", Andrea Colcelli, Giuseppe Mussardo, German Sierra, Andrea Trombettoni; *Phys. Rev. Lett.* **123**, 130401 (2019); arXiv:1902.07809.
- [164] "Entanglement as geometry and flow", S. Singha Roy, S. N. Santalla, J. Rodríguez-Laguna, G. Sierra, *Phys. Rev. B* **101**, 195134 (2020). arXiv:1906.05146 2019
- [165] "Piercing the rainbow: entanglement on an inhomogeneous spin chain with a defect", N. S. S. de Buruaga, S. N. Santalla, J. Rodríguez-Laguna, G. Sierra, *Phys. Rev. B* **101**, 205121 (2020). arXiv:1912.10788 2019.

- [166] "Identifying the Riemann zeros by periodically driving a single qubit", Ran He, Ming-Zhong Ai, Jin-Ming Cui, Yun-Feng Huang, Yong-Jian Han, Chuan-Feng Li, Tao Tu, C.E. Creffield, G. Sierra, Guang-Can Guo, Phys. Rev. A **101**, 043402 (2020); arXiv:1903.07819.
- [167] "Multi-Layer Restricted Boltzmann Machine Representation of 1D Quantum Many-Body Wave Functions", Huan He, Yunqin Zheng, B. Andrei Bernevig, German Sierra; arXiv:1910.13454.
- ~ Year 2020 ~
- [168] "Field Tensor Network States" Anne E. B. Nielsen, Benedikt Herwerth, J. Ignacio Cirac, Germán Sierra, Phys. Rev. B **103**, 155130 (2021); arXiv:2001.07723.
- [169] "The Prime state and its quantum relatives", D. García-Martín, E. Ribas, S. Carrazza, J.I. Latorre, G. Sierra, Quantum **4**, 371 (2020); arXiv:2005.02422.
- [170] "Dynamics of one-dimensional quantum many-body systems in time-periodic linear potentials", Andrea Colcelli, Giuseppe Mussardo, German Sierra, Andrea Trombettoni, Phys. Rev. A **102**, 033310 (2020). arXiv:2006.11299.
- [171] "Integrability and scattering of the boson field theory on a lattice", Manuel Campos, Germán Sierra, Esperanza López, J. Phys. A: Math. Theor. **54**, 055001 (2021); arXiv: 2009.03338.
- [172] "Free Fall of a Quantum Many-Body System", Andrea Colcelli, Giuseppe Mussardo, German Sierra, Andrea Trombettoni, American Journal of Physics **90**, 833 (2022); arXiv:2009.03744.
- [173] "Bulk-edge correspondence in the Haldane phase of the bilinear-biquadratic spin-1 Hamiltonian", Sudipto Singha Roy, Silvia N. Santalla, Javier Rodríguez-Laguna, Germán Sierra; Stat. Mech. 053102 (2021); arXiv:2011.05452.
- [174] "Simple Mitigation Strategy for a Systematic Gate Error in IBMQ", Daniel Bultrini, Max Hunter Gordon, Esperanza López, Germán Sierra; J. of App. Math. and Phys. **9**, 1215 (2021); arXiv:2012.00831
- ~ Year 2021 ~
- [175] "Riemann zeros from a periodically-driven trapped ion", Ran He, Ming-Zhong Ai, Jin-Ming Cui, Yun-Feng Huang, Yong-Jian Han, Chuan-Feng Li, Guang-Can Guo, G.Sierra, C.E. Creffield, npj Quan. Info. **7**, 109 (2021); arXiv:2102.06936.
- [176] "Link representation of the entanglement entropies for all bipartitions", Sudipto Singha Roy, Silvia N. Santalla, Germán Sierra, Javier Rodríguez-Laguna, J. Phys. A: Math. Theor. **54**, 305301 (2021); arXiv:2103.08929.
- [177] "Simulating quench dynamics on a digital quantum computer with data-driven error mitigation", Alejandro Sopena, Max Hunter Gordon, Germán Sierra, Esperanza López, Quantum Sci. Technol. **6**, 045003 (2021); arXiv:2103.12680.
- [178] "Tensor Renormalization Group for interacting quantum fields", Manuel Campos, German Sierra, Esperanza Lopez, Quantum **5**, 586 (2021); arXiv:2105.00010.
- [179] "Simulating violation of causality using a topological phase transition", Sudipto Singha Roy, Anindita Bera, Germán Sierra, Phys. Rev. A **105**, 032432 (2022); arXiv:2105.09795.
- [180] "Cold atoms meet lattice gauge theory", Monika Aidelsburger, Luca Barbiero, Alejandro Bermudez, Titas Chanda, Alexandre Dauphin, Daniel González-Cuadra, Przemyslaw R. Grzybowski, Simon Hands, Fred Jendrzejewski, Johannes Jünemann, Gediminas Juzeliunas, Valentin Kasper, Angelo Piga, Shi-Ju Ran, Matteo Rizzi, German Sierra, Luca Tagliacozzo, Emanuele Tirrito, Torsten V. Zache, Jakub Zakrzewski, Erez Zohar, Maciej Lewenstein, Phil. Trans. R. Soc. A **380**, 20210064 (2021); arXiv:2106.03063.
- [181] "Platonic Entanglement", José I. Latorre, Germán Sierra, Quantum Inf. Comput. **21**, 1081 (2021); arXiv:2107.04329.
- [182] "Entanglement in non-critical inhomogeneous quantum chains", Nadir Samos Sáenz de Buruaga, Silvia N. Santalla, Javier Rodríguez-Laguna, Germán Sierra, Phys. Rev. B **104**, 195147 (2021); arXiv:2107.12113.
- [183] "Exotic correlation spread in free-fermionic states with initial patterns", Sudipto Singha Roy, Giovanni Ramírez, Silvia N. Santalla, Germán Sierra, Javier Rodríguez-Laguna, Physical Review B **105**, 214306 (2022); arXiv:2112.13382.
- [184] "General quantum Chinos games", Daniel Centeno, German Sierra, J. Phys. Commun. **6**, 075009 (2022). arXiv:2112.05175.
- ~ Year 2022 ~
- [185] "Algebraic Bethe Circuits", Alejandro Sopena, Max Hunter Gordon, Diego García-Martín, Germán Sierra, Esperanza López, Quantum **6**, 796 (2022); arXiv:2202.04673.
- [186] "Entanglement links and the quasiparticle picture", Silvia N. Santalla, Giovanni Ramírez, Sudipto Singha Roy, Germán Sierra, Javier Rodríguez-Laguna, Phys. Rev. B **107**, L121114 (2023); arXiv:2208.03766.
- [187] "Depletion in fermionic chains with inhomogeneous hoppings", Begoña Mula, Nadir Samos S 'aenz de Buruaga, Germán Sierra, Silvia N. Santalla, Javier Rodríguez-Laguna, Phys. Rev. B **106**, 224204 (2022); arXiv:2209.10624.
- [188] "Symmetries and field tensor network states", Albert Gasull, Antoine Tilloy, J. Ignacio Cirac, Germn Sierra, Phys. Rev. B (2023); arXiv:2209.11253.
- ~ Year 2023 ~
- [189] "Q-Deformed Rainbows: a Universal Simulator of Free Entanglement Spectra", Lucy Byles, Germán Sierra, Jiannis K. Pachos, arXiv:2302.01950.

Chapters of books and reviews

- [190] "An introduction to N=2 rigid supersymmetry", G. Sierra, P. K. Townsend, Proceedings of the XIXth Winter School in Karpacz, Poland, edit. B. Milewsky, World Scientific (Singapore 1983).
- [191] "The geometry of N=2 supersymmetry", G. Sierra, Proceedings of the 7th Johns Hopkins Workshop on current problems in particle theory, Bad Honnef Bonn, Germany, edit. G. Domokos, S. Kovesi-Domokos, World Scientific (Singapore 1983).
- [192] "Supersimetría N=2 o la magia del cuadrado", G. Sierra, Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales de Madrid, Tomo LXXIX, cuadernos **1, 2** (1985).
- [193] "The N=2 Maxwell-Einstein supergravity theories: their compact and non-compact gaugings and Jordan algebras", M. Gunaydin, G. Sierra, P. K. Townsend, Proceedings of the conference on Supersymmetry and its applications, edit. G. Gibbons, S. Hawking y P. K. Townsend, Cambridge Univ. Press 1986.
- [194] "Topics in conformal field theory", L. Alvarez-Gaumé, C. Gómez, G. Sierra, Memorial Volume for V. Knizhnik, edit. L. Brink, D. Friedan y A.M. Polyakov, World Scientific (Singapore 1990).
- [195] "Duality and quantum groups", G. Sierra, Proceedings of the Johns Hopkins Workshop, Florence, edit. L. Lusanna, World Scientific (Singapore 1990).
- [196] "Comments on rational conformal field theories", C. Gómez, G. Sierra, Proceedings of the 8th Summer Workshop on Mathematical Physics, Claustal, Germany, World Scientific (Singapore 1990).
- [197] "Quantum groups, Riemann surfaces and CFT's", C. Gómez, G. Sierra, Proceedings of the XIX DGM Conference Rapallo 1990.
- [198] "Contour representation of quantum groups in RCFT's", C. Gómez, G. Sierra, Proceedings of the 1990 Trieste Summer School.
- [199] "Integrability and quantum symmetries", C. Gómez, G. Sierra, Proceedings of Nucl. Phys. **B 18** (1991) 107.
- [200] "A note on Liouville theory and the uniformization of Riemann surfaces" C. Gómez, G. Sierra, in Proceedings of the workshop on "Quantum Field Theory, Statistical Mechanics, Quantum Groups and Topology" World Scientific, 1992.
- [201] "A brief history of hidden quantum symmetries in RCFT's", C. Gómez, G. Sierra, Proceedings of the NATO Advanced Study Institute and XXIII GIFT Seminar on "Integrable Systems, Quantum Groups, and Quantum Field Theories", edited by L. A. Ibrat and M. A. Rodríguez, Kluwer Academic Publishers, London, 1993; hep-th/9211068.
- [202] "The Renormalization Group Method and Quantum Groups: the Postman always rings twice", M.A. Martín-Delgado, G. Sierra, in "From Field Theory to Quantum Groups", Editors, B. Jancewicz y J. Sobczyk, World Scientific, Singapore (1996); hep-th/9511190.
- [203] "On the Application of the Non-Linear Sigma Model to Spin Chains and Ladders", G. Sierra, in "Strongly Correlated Magnetic and Superconducting Systems", Lecture Notes in Physics vol. **478**, Springer-Verlag (1997); cond-mat/9610057.
- [204] "A Recurrent Variational Ansatz", M. A. Martín-Delgado, G. Sierra, in "The Density Matrix Renormalization Group", Lecture Notes in Physics, editado por I. Peschel, K. Hallberg y X. Wang, Springer-Verlag (1999).
- [205] "The Density Matrix Renormalization Group, Quantum Groups and Conformal Field Theory", G. Sierra, M.A. Martín-Delgado, Contribución al libro "The Exact Renormalization Group Method", editado por Y. Kubishing et al. World Scientific (1999); cond-mat/9811170.
- [206] "The Recurrent Variational Approach applied to the Electronic Structure of Conjugated Polymers", S. Pleutin, E. Jeckelmann, M. A. Martín-Delgado, G. Sierra, Progress in theoretical chemistry and physics, Vol. 7: New Trends in Quantum Systems in Chemistry and Physics Volume 2. Advanced Problems and Complex Systems. Paris, France, 1999; cond-mat/9908062.
- [207] "Integrability and Conformal Symmetry in the BCS model", G. Sierra, Proceedings of the NATO Advanced Research Workshop on Statistical Field Theories, Como (Italy), June 2001. Eds. Andrea Cappelli y Giuseppe Mussardo. Kluwer Academic Publishers, vol. 73, Netherlands (2002); hep-th/0111114.
- [208] "The elementary excitations of the BCS model in the canonical ensemble", G. Sierra, J. M. Román, J. Dukelsky; Int. J. Mod. Phys. A **19S2** (2004) 381. Proceedings of the 6th International workshop on Conformal Field Theory and Integrable Models, Chernogolka, Russia, Sept. 2002; cond-mat/0301417.
- [209] "Física y/o Matemáticas". G. Sierra. "Meeting on Fundamental Physics 'Alberto Galindo'", Alvarez-Estrada R. F. et al. (Ed.), Madrid: Aula Documental, 2004
- [210] "The cyclic renormalization group", G. Sierra, Proceedings of the 23rd International Conference of Differential Geometric Methods in Theoretical Physics (DGMTP), eds. Mo-Lin Ge & Weiping Zhang Tianjin, China, August 2005. World Scientific (2007).
- [211] "DMRG applied to critical systems: spin chains" J. Almeida, M.A. Martín-Delgado, G. Sierra. 11th Training Course in the Physics of Strongly Correlated Systems, Oct 02-13, 2006 Salerno ITALY Lectures on the Physics of Strongly Correlated Systems XI, Vol: 918, 261-271 (2007)
- [212] "A Physics pathway to the Riemann hypothesis", G. Sierra, in "Mathematical physics and field theory: Julio Abad," in Memoriam" . Eds. Manuel Asorey Carballeira, José Vicente García Esteve, Manuel F. Ranada, J. Sesma, 2009, ISBN 978-84-92774-04-3 , pags. 383-390
- [213] "Breaking the Area Law: The Rainbow State", Giovanni Ramírez, Javier Rodríguez-Laguna, Germán Sierra; In "Strongly Coupled Field Theories for Condensed Matter and Quantum Information Theory". Proceedings, International Institute of Physics, Natal, Rn, Brazil, 2-21 August 2015. Editors: Ferraz, A., Gupta, K.S., Semenoff, G.W., Sodano, P. (Eds.) arXiv:1812.11495.

- [214] "Emergent geometry from entanglement structure", Sudipto Singha Roy, Silvia N. Santalla, Javier Rodríguez-Laguna, Germán Sierra, Quantum Theory and Symmetries, Proceedings of the 11th International Symposium, Montreal, Canada, Springer International Publishing, Page 347-357 (2021); arXiv:2104.03645.

Books as coautor

- "Introducción a la teoría de cuerdas y supercuerdas", J. Ramírez Mittelbrunn, M. Ramón Medrano, G. Sierra, editado por la Real Academia de Ciencias Exactas, Físicas y Naturales, Madrid, 1987.
- "Teorías de campos conformes, sistemas integrables y grupos cuánticos", R. Cuerno, C. Gómez, G. Sierra, editado por la Universidad de Salamanca, 1991.
- "Quantum electron liquids and high- T_c superconductivity", J. González, M.A. Martín-Delgado, G. Sierra, A. H. Vozmediano, Lecture Notes in Physics vol. **m38**, Springer-Verlag, 1995; cond-mat/9509134.
- "Quantum Groups in two-dimensional Physics", C. Gómez, M. Ruiz-Altaba, G. Sierra, Cambridge Monographs on Mathematical Physics, Cambridge University Press, London, 1996.

Books as editor

- "Strings and Superstrings", XVIII Seminario Internacional del GIFT en Física Teórica, Editores: J.R. Mittelbrunn, M. Ramón-Medrano, G. Sierra, World Scientific (Singapore, 1988).
- "Strongly Correlated Magnetic and Superconducting Systems", Proceedings de la Escuela de Verano organizada en El Escorial dentro de las actividades de la Universidad de Verano de la U. Complutense, Madrid 1996. Editores G. Sierra, M.A. Martín-Delgado, Lecture Notes in Physics vol. **478**, Springer-Verlag, 1997.

Talks

- XIX Winter School and Workshop of Theoretical Physics, Karpacz, Poland, (1983).
- 7th Johns Hopkins Workshop on Current Problems in Particle Theory, Bonn, Germany, (1983).
- 13th Johns Hopkins Workshop on Current Problems in Particle Theory, Florence, Italy, (1989).
- 8th Summer Workshop on Mathematical Physics on Quantum Groups, Clausthal, Germany, (1989).
- Pavia Seminar on Quantum Groups, Pavia, Italy, (1990).
- Summer School in High-Energy Physics, Trieste, Italy, (1990).
- Advanced Research Workshop on Quantum Field Theory, Statistical Mechanics, Quantum Groups and Topology, Miami, USA, (1991).
- Research Conference on Advanced Quantum Field Theory and Critical Phenomena, Como, Italy, (1991).
- XXI Conference on Differential and Geometrical Methods in Theoretical Physics, Tianjin, China, (1992).
- XXIII GIFT Seminar on Recent Problems in Mathematical Physics, Salamanca, Spain, (1992).
- Workshop in the Landau Institute of Theoretical Physics on "Topics of Mathematical Physics", Chernogolovsk-Moscow, Russia, (1994).
- Workshop in Topics on Statistical Mechanics, Seville, Spain, (1994).
- Colloquium "Selected Topics in Mathematical Physics", Lyon, France, (1995).
- Workshop on "Spin-Fermion Models of High- T_c Superconductors", Florence, Italy, (1996).
- Workshop on "The Density Matrix Renormalization Group", Max Planck Institute, Dresden, Germany, (1998).

- Workshop on “The Exact Renormalization Group”, Faro, Portugal, (1998).
- Workshop on “Quantum Magnetism”, Institute of Theoretical Physics, Santa Barbara, USA, (1999).
- Workshop on “Integrable Models in Condensed Matter and Non-Equilibrium Physics”, Montreal, Canada (2000).
- VIII Escuela de Otoño de Física Teórica sobre “Métodos de Teoría Cuántica de Campos en Física de la Materia Condensada”, Santiago de Compostela, 4-15 sep 2000, Spain.
- NATO advanced research workshop on “Statistical field theories”, Villa Olmo, Como (Italy), 18-23 June 2001.
- Workshop on the “Exact Renormalization Group”, 9-13 July, 2001, Benasque, Spain.
- Workshop on the “Conformal Field Theory and Integrable Models”, Chernogolovka, Moscow, 16-22 Sep 2002, Russia.
- Workshop on “Integrable Models and Applications: from Strings to Condensed Matter”, Florence, Italy 15-20 September 2003.
- Workshop on “Low dimensional Field Theory at work in Condensed Matter and String Theory”, Capri, Italy 20-22 September 2004.
- XXIII International Conference of Differential Geometric Methods in Theoretical Physics, Nankai Institute of Mathematics, August 20-26, 2005 Tianjin, China.
- Interdisciplinary Statistical and Field Theory Approaches to Nanophysics and low-dimensional Systems, 12-16 June 2006, Como, Italy.
- 17th National Congress of the Australian Institute of Physics, 3-8 December 2006, Brisbane, Australia.
- Statistical Mechanical/Gordon Godfrey workshop, 11, 12 December 2006, Sydney, Australia
- STATPHYS 23 Satellite Meeting “Statistical Field Theory of Quantum Devices” 16 - 19 July 2007, Perugia, Italy.
- Plenary talk at ‘The 5th International Symposium on Quantum Theory and Symmetries’ 22- 28 July 2007, University of Valladolid, Spain.
- Invited talk at the International Conference in Statistical Physics Sigma Phi 2008, Orthodox Academy of Crete, Kolymbari, Chania, Greece 14-18 July 2008.
- Invited talk at the Workshop on “Low-dimensional Quantum Field Theories and Applications”, Galileo Galilei Institute for Theoretical Physics (GGI), Firenze (Italy), 8-12 September 2008.
- Invited talk at XV Jornada SIMUMAT on “Simulación Numérica de Procesos Cuánticos”, Universidad Autónoma de Madrid, 22 September 2008.
- Invited talk at the Workshop on “Theoretical aspects of Tensor Network states”, Facultad de Matemáticas, Universidad Complutense de Madrid, 15-18 October 2008.
- Invited talk at the “Workshop on Correlations and Coherence in Quantum Matter”, Evora, Portugal, 10-14 November 2008.
- Invited talk at “Conference on Bifurcations: Mathematical & Quantum Aspects & Applications, BIFUR 08”, Madrid, 9-12 December 2008.
- Invited talk at the Amsterdam Summer Workshop on Low-D Quantum Condensed Matter, Amsterdam, The Netherlands, 6-11 July 2009.
- Invited talk at the ‘Quantum Information Concepts for Condensed Matter Problems’, at the Max-Planck Institute for Physics of Complex Systems. Organized by Ian Affleck (UBC, Vancouver), Masud Haque (MPI-PKS Dresden) and Ulrich Schollwoeck (LMU, Munich). Dresden, Germany, 14-25 June 2010.
- Invited talks at the Mathematica Summer School on Theoretical Physics devoted to the subject “2D Physics in Condensed Matter”. Organized by Pedro Vieira (Perimeter Institute). Porto, Portugal, 11- 16 July 2010.

- Invited talk at the "Kavli Royal Society International Meeting on Topology and Physics". Organized by Jiannis K. Pachos (University of Leeds). Checheley Hall, London, 14-17 July 2010.
- Invited talk at the "International Workshop on Density Matrix Renormalization Group and Other Advances in Numerical Renormalization Group Methods". Organized by X. Wang (Renmin University of China) and T. Xiang (Chinese Academy of Sciences). Beijing, China, August 3- September 23, 2010.
- Invited talk at the "Third Iberian Mathematical Meeting". Organized by M. Abreu (SMP). Braga, Portugal, 1-3 October 2010.
- Invited talk at the workshop on "Quantum coherence and correlations in condensed-matter and cold-atom systems". Organized by J. Carmelo (University of Evora). Evora, Portugal, 11-15 October 2010.
- Invited talk to the workshop "What is Quantum Field Theory?", Organized by M. Asorey et al. (U. Zaragoza), 2011, Sep 14 – Sep 18 (Benasque, Spain).
- Workshop on "Advanced Conformal Field Theory". Organized by P. Fendley, H. Saleur, V. Schomerus, S. H. Simon, N. Read and J. Jacobsen. Institut Henri Poincare, Paris, France, 1-31 Oct 2011.
- Workshop on "Topological Quantum Computation", Organized by K. Schoutens. The Institute of Physics, University of Amsterdam, The Netherlands, 6-7 Feb 2012.
- Workshop on "New quantum states of matter in and out of equilibrium". Organized by I. Affleck (U. British Columbia), P. Calabrese (Pisa University), J. Cardy (U. Oxford), F. H. L. Essler (U. Oxford), E. Fradkin (U. Illinois at Urbana-Champaign), F. D. M. Haldane (Princeton University). Galileo Galilei Institute for Theoretical Physics (GGI). Florence, Italy, April 2012.
- XXXV Encontro Nacional de Física da Matéria Condensada. 14 - 18 May 2012, Águas de Lindóia, Sao Paulo, Brasil.
- Workshop on "Quantum Simulations with Ultracold Atoms". Organized by I. Bloch, M. Inguscio, M. Lewenstein, G. Mussardo and A. Trombettoni, ICTP, Trieste, Italy, 16-20 July 2012.
- Workshop on "The Beauty of Integrability: low-dimensional Physics, Statistical Models and Solitons". Organized by F. Alcaraz (U. de So Paulo, Brazil), G. Mussardo (SISSA-ICTP, Trieste, Italy) P. Pearce (U. Melbourne, Australia). The International Institute of Physics (IIP), Federal University of Rio Grande do Norte, Natal, Brasil, 15-28 July 2012.
- Workshop on Advances in Quantum Technology: From Quantum Information to Quantum Devices The International Institute of Physics, Natal, Brazil, August 2012.
- Workshop on "Disordered and Topological Systems". Organized by Ravin Bhatt (Princeton University), Ming-Chiang Chung (Chung-Hsing University), Xin Wan (Zhejiang University) Zhejiang University, Hangzhou, China, March 18-22, 2013
- Workshop on "Quantum Physics: from fundamental questions to applications". Organized by I. Cirac and M. Lewenstein. Casa de la Pedrera, ICFO, Barcelona, Spain, May 22-24.
- Workshop on "Quantum Many Body Systems in Low Dimensions: Theory and Experiment". Organized by Xiwen Guan, Zong-Chao Yan, Chao-Hong Lee, Murray T Batchelor, Chengbin Li, Li-Juan Liu. Wuhan Institute of Physics and Mathematics, Chinese Academy of Science, Wuhan, China, 19-21 June 2013.
- Workshop on "Topological Phases in Condensed Matter and Cold Atom Systems: towards quantum computations". Organized by D. Poilblanc (CNRS & Univ. de Toulouse, FR), E. Ardonne (Stockholm University, SE), N. Regnault (ENS, FR & Princeton Univ., US), M. Troyer (ETH Zurich, CH). Institut d'Etude Scientifique de Cargese (IESC), France, June 24 to July 6, 2013.
- 1st i-Link Workshop Macro-from-Micro: Quantum Gravity and Cosmology. Organized by G. Calcagni (IEM-CSIC), G. A. Mena Marugn (IEM-CSIC), M. Fernandez-Mendez (IEM-CSIC). Madrid, Septiembre 2013.
- Workshop on "Perspectives on Quantum Many-Body Entanglement". Organized by Román Orús (JGU Mainz) and Matteo Rizzi (JGU Mainz). Johannes-Gutenberg Universitat, Mainz, Germany, September 2013.

- Lectures at the Winter PhD School on Statistical Field Theory, The Galileo Galilei Institute for Theoretical Physics Arcetri, Florence, Italy. 3-14 Feb, 2014. Organizers: P. Calabrese, A. Cappelli, F. Colomo, G. Mussardo.
- Workshop on "Tensor Networks and Simulations". Organized by J. Ignacio Cirac and Frank Verstraete. Simons Institute for the Theory of Computing at Berkeley University (USA). April 21-25 (2014).
- Workshop on "Entanglement Entropy in Many Body Quantum Systems". Organized by Olalla Castro-Alvaredo and Benjamin Doyon. King's College London and City University London, 2-4 June 2014.
- Workshop Información Cuántica en España, ICE-1", University of Zaragoza, June 25th - 27th (2014).
- Tercer Encuentro Conjunto de la Real Sociedad Matemática Española y la Sociedad Matemática Mexicana., Zacatecas, México, 1-5 Sept 2014.
- 9th Bologna Workshop in CFT and Integrable Models. Organized by F. Ravanini. Bologna, Italy, 15-18 Oct 2014.
- Real Sociedad de Matemática Española Congress, Granada, 2-4 February 2015.
- International Conference in Number Theory and Physics, Institute of Mathematics Pure and Applied (IMPA), Rio de Janeiro (Brasil), June 15-26, 2015.
- Workshop on "Strongly Coupled Field Theories for Condensed Matter and Quantum Information Theory", Natal (Brasil) August 17 - 21 ,2015.
- Workshop "Matrix Product States - day", LPTENS; LPTHE, Jussieu, Paris, 21st Sept 2015.
- VI Reunión Nacional de Sólidos, La Plata (Argentina), 9-12 de Noviembre 2015.
- Workshop "Entanglement in Strongly Correlated Systems", Centro de Ciencias de Benasque Pedro Pascual, 14-27 February 2016. Benasque, Spain.
- Program "Entanglement and dynamical systems", Simons Center of Geometry and Physics, 15th Sept. 2016, Stony Brook (USA).
- Workshop "Entanglement in Strongly Correlated Systems", Centro de Ciencias de Benasque Pedro Pascual, 6-18 February 2017. Benasque, Spain.
- Workshop and school on "Tensor categories and topological quantum matter", 20-30 July 2017, Fudan University, Shanghai (China).
- Workshop "Quantum Day@BSC" , Friday 22nd September, 2017, Barcelona (Spain).
- Program "Wonders of Broken Integrability", Simons Center of Geometry and Physics, 2 - 6 Oct. 2017, Stony Brook (USA).
- GGI workshop sobre "Entanglement in Quantum Systems", Florence (Italy), 13-22 June 2018,
- Workshop "Perspectives in Topological phases: From Condensed Matter to High-Energy Physics", Quy-Nhon, Vietnam, 14-22 July 2018.
- Workshop "Quantum Computing for HEP", CERN, Geneva, 5-6 November 2018.
- Meeting on "Quantum Information Processing and Applications", Harish-Chandra Research Institute, Allahabad, India, 1-8 December 2018.
- Workshop "ANYON19", Max Planck Institute of Complex Systems, Dresden 21-25 January, 2019. Title: "Topological rainbow chains".
- March meeting of the American Physical Association (APS), Los Angeles (EEUU), 4- 8 March 2019. Title: "Topological phases of the rainbow chain".
- Workshop "Curiosity-Driven Physics: From Algebras to Quantum Chains and Statistical Mechanics", SISSA, Trieste, Italy, 22-24 April, 2019.

- Workshop "Quantum Computing Meetup", Zurich University, 15-17 May 2019. Title: "Causality, Long Range Order and Topological Order".
- Workshop on Advanced Resolution Techniques for Equations in Mathematical Physics, ARTEMP'2019. Universidad Complutense Madrid, 24-27 June 2019. Madrid (Spain). Title: The Haldane-Shastry model and Conformal Field Theory.
- XIth International Symposium: Quantum Theory and Symmetries(QTS), Centre de Recherches Mathématiques, Montreal, Canada, 1-5 July 2019.
- Workshop "The Wonders of Theoretical Physics", ICTP and SISSA, Trieste, 23-25 October 2019. Title: "Doing Physics with Numbers".
- HEP-TN online seminar. Organized by the Gravity, Quantum Fields and Information Group Max Planck Institute for Gravitational Physics, March 27, 2020, Postdam, Germany. Title: "Tensor networks with infinite bond dimension".
- Summer School on Quantum Computing : Software for Near Term Quantum Devices, Universidad Internacional Menéndez Pelayo (UIMP), 31 August - 4 September 2020). [On line].
- Institute for Pure & Applied Mathematics (IPAM). Workshop II: Tensor Network States and Applications, Los Angeles (USA), April 19 - April 23, 2021. Title: Tensor Network Renormalization of Bosonic Fields [One line].
- 6th INFIERY Summer School, 1st September 2021, Madrid. Title: Introduction to Quantum information and Computation.
- 6th INFIERY Summer School, 24th August- 3rd September 2021, Madrid. Title: Quantum Lab: Enjoying the IBM quantum experience, together with Esperanza Lpez
- Summer School on Quantum and Q-Inspired Computing. Universidad Internacional Menéndez Pelayo (UIMP), 6 -10 September 20201. Title: Introducing Quantum Computing I. [On line].
- Mathematical harmony and the quantum world. 14-16 October 2021, Ecole Normale Supérieure de Paris. Title: Riemann zeros at a quantum Lab.
- Workshop on New Trends in Quantum Physics. University of Zaragoza (Spain) , 3rd December 2021. Title: Calculating Riemann zeros in a Quantum Lab.
- Instituto Balseiro, Bariloche (Argentina), 1st February (2022). Title: Conformal Field Theory applied to spin chains and the fractional quantum Hall effect.
- Instituto Gallego de Física de Altas Enerxias, Santiago de Compostela (Spain), April 1st, 2022. Title: Quantum realizations of the Riemann zeros and the prime numbers.
- Workshop "Simulating Quantum Many-Body Systems on Noisy Intermediate-Scale Quantum Computers (NISQ22)", 25 - 28 April 2022, Max Planck Institute for the Physics of Complex Systems (MPIPKS) in Dresden (Germany). Title: Algebraic Bethe Circuits.
- Institute of Theoretical Physics, University of Innsbruck (Austria), 6 July 2022, Theory colloquium on: "Tensor networks and Conformal Field Theory".
- Workshop on Number Theory and Physics, Simons Center for Geometry and Physics, 25 October 2022. Title: Quantum Computation of Prime number functions.

Organization of workshops

- XVIII International GIFT Seminar on "Strings and Superstrings". El Escorial, Madrid, 1987. Coorganizers: J. Ramírez Mittelbrunn (UCM) and M. Ramon Medrano (UCM).
- Curso de la U. Menéndez Pelayo sobre "El Universo a cortas y largas distancias: gran unificación y supercuerdas", Santander, 87. Director: Juan Perez Mercader, secretary: G. Sierra.

- Universidad Complutense Summer School on “Strongly Correlated Magnetic and Superconducting Systems”. El Escorial, Madrid, 1996. Coorganizer: M. A. Martín-Delgado (UCM).
- Journeys on “Quantum Field Theory in Low Dimensional Systems and Condensed Matter”, Instituto de Ciencias de Materiales CSIC. Cantoblanco, Madrid, 1996. Coorganizers: F. Guinea (CSIC), C. Tejedor (UAM), L. Brey (CSIC), G.Gómez-Santos (UAM), G. Sierra (CSIC) y M.A. Martín Delgado (UCM).
- “Advanced Seminar on Field Theoretical Methods in Condensed Matter Physics”. Girona, Spain , 2001. Coorganizer: D. Espriu (U Barcelona).
- ”INSTANS Summer School”, Centro de Ciencias de Benasque (Huesca, Spain), 2010. Coorganizers: G. Mussardo (SISSA), K. Schoutens (ITFA).
- ”Quantum Mechanics, Operator Theory and the Riemann Zeta function”. Centro de Ciencias de Benasque (Huesca, Spain), 2012. Coorganizers: J.P. Keating (U. Bristol, UK), J.C. Lagarias (U. Michigan, USA).
- Workshop Entangle This: strings, fields and atoms, IFT UAM-CSIC, 2012 November 19-21, Madrid, Spain. Coorganizers: Esperanza Lopez (IFT), Jose Barbon (IFT) and Karl Landsteiner (IFT).
- Workshop on ”Quantum Integrability, Conformal Field Theory and Topological Quantum Computation”, Coorganized with F. C. Alcaraz (Sao Carlos, Brazil); F. H. L. Essler, (Oxford, UK); G. Mussardo, (Trieste, Italy); G. Sierra, (Madrid, Spain) and Rodrigo Pereira, (Sao Carlos, Brazil); March 23- April 06, 2014. Natal (Brasil).
- Workshop ”Entangle This: Space, Time & Matter”, Organizers: Jose L.F. Barbon, Esperanza Lopez, Belen Paredes, German Sierra. IFT UAM/CSIC Madrid, February 16 - 20, 2015.
- Latin American Workshop in Condensed Matter: Low Dimensional Topological Quantum Matter. International Institute of Physics (I3P). August 24 - 28, 2015, Natal, Brazil. Organizers: Daniel Cabra(National University of La Plata, Argentina) and German Sierra (UAM/CSIC, Madrid, Spain).
- Program on ”Mathematical Aspects of Quantum Integrable Models in and out of Equilibrium”, Isaac Newton Institute for Mathematical Sciences, Cambridge (UK). 11th January 2016 to 5th February 2016. Organisers: Denis Bernard (Paris), Fabian H. L. Essler (Oxford), Giuseppe Mussardo (Trieste), German Sierra (Madrid).
- Conference on ”Entanglement and Non-Equilibrium Physics of Pure and Disordered Systems”, 25 Jul 2016 - 27 Jul 2016, ICTP, Trieste (Italy). Organizers: Pasquale Calabrese, Olalla Castro-Alvaredo, Fabian H. L. Essler, Markus Mueller, Giuseppe Mussardo, Antonello Scardicchio, German Sierra.
- Workshop ”Entangle This: Tensor Networks and Gravity”, Organizers: Jose L.F. Barbón, Ignacio Cirac, Esperanza Lopez, David Pérez-García, Germán Sierra, Y-W. Sun. IFT UAM/CSIC Madrid, May 8 - 10, 2017.
- Thematic program ”Quantum Paths” at the The Erwin Schroedinger International Institute for Mathematics and Physics (ESI), Chongqing, April 9 - June 8, 2018.
- Workshop ”Entangle This IV: Chaos, Order and Qubits”, Organizers: Jose L.F. Barbón, Esperanza Lopez, David Pérez-García, Germán Sierra. IFT UAM/CSIC Madrid, September 9 - 13, 2019.
- Program on ”Physics and Number Theory”. Simons Center for Geometry and Physics, Stony Brook (USA), 24 October - 18 November, 2022. Oorganizers: Conrey (American Institute of Mathematics), Matilde Lalin (Université de Montral), Giuseppe Mussardo (SISSA, Trieste), German Sierra (UAM/CSIC).

Direction of PhD thesis

- Title: “Simetrías grupo cuánticas en Teorías Superconformes”. PhD student: Fernando Jiménez Lorenzo. Universidad Complutense de Madrid, Facultad de Ciencias Físicas (1992). Thesis score: Sobresaliente Cum Laude.
- Title: “Modelos bidimensionales de vértices y simetrías bajo álgebras cuánticas”. PhD student: Rodolfo Cuerno Rejado. Universidad Autónoma de Madrid, Facultad de Ciencias Físicas (1993). Thesis score: Sobresaliente Cum Laude.

- Title: "Renormalization group techniques in real space and applications" PhD student: Javier Rodríguez-Laguna. Universidad Complutense de Madrid, Facultad de Ciencias Físicas (2002). Codirected with M. A. Martín Delgado Alcántara. Thesis score: Sobresaliente Cum Laude.
- Title: "Critical and massive phases VBS in strongly correlated systems". PhD student: Javier Almeida Linares, Universidad Complutense de Madrid, Facultad de Ciencias Físicas (23 June 2009). Codirected with M. A. Martín Delgado Alcántara. Thesis score: Sobresaliente Cum Laude.
- Title: "Exactly solvable models in low-dimensional many-body physics". PhD student: Miguel Ibañez Berganza, Universidad Autónoma de Madrid, Facultad de Ciencias (14 November 2011). Thesis score: Sobresaliente Cum Laude.
- Title: "Quantum Entanglement in Random and Inhomogeneous Spin Chains". PhD student: Giovanni Ramírez, Universidad Autónoma de Madrid, Facultad de Ciencias (3 July 2015). Codirected with J. Rodríguez Laguna. Thesis score: Sobresaliente Cum Laude.
- Title: "Gaussian Many-Body States: Tachyonic Quenches and Conformal Blocks". PhD student: Sebastián Montes Palencia. Universidad Autónoma de Madrid, Facultad de Ciencias (13 May 2018). Codirected with J. Rodríguez Laguna. Thesis score: Sobresaliente Cum Laude.
- Title: "Quantum Algorithms for Condensed-Matter Physics, Number Theory and Quantum Machine Learning". PhD student Diego García Martín Universidad Autónoma de Madrid (21 November 2022). Codirected with J. I. Latorre. Thesis score: Sobresaliente Cum Laude.
- Title: "Entanglement in inhomogeneous quantum chains". PhD student: Nadir Samos Sáenz de Buruaga. Universidad Autónoma de Madrid (5 April 2022). Codirected with J. Rodríguez Laguna. Thesis score: Sobresaliente Cum Laude.

Other merits

- National Bachelor's Award (1980).
- Extraordinary PhD Award from the UCM (1981).
- Editor of "Journal of Statistical Mechanics: Theory and Experiment" JSTAT (since 2004) and the "Journal of High Energy Physics" JHEP (since 2012).
- Coordinator of the National Evaluation Agency and Prospective (ANEP) in the area of Physics and Space Sciences (January 2004 - November 2006).
- Coordinator of the ANEP Physics Panel in the exercise of prospective for the National Plan 2008-2010.
- Vicedirector of the Instituto de Física Teórica UAM/CSIC (2007-2009).
- Member of the Commission of the Area of "Science and Physical Technologies of the CSIC (July 2008-April 2012).
- Fulbright fellow at the Physics Department, Princeton University. April-June 2015.
- Member of IUPAP mathematical-physics commission C18 until October 2021.