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**EDUCATION**

*Doctor of Philosophy (Ph.D.):*

Physics, August 1994, Massachusetts Institute of Technology, Cambridge, MA, USA.  
Thesis: *Universal Correlations in the Quantum Spectra of Chaotic Systems and Exactly Solvable Many-Body Problems*. Adviser: Boris L. Altshuler (currently at Columbia University)

*Master of Science (M.S.):*

Nuclear Physics, December 1988, University of São Paulo, São Paulo, Brazil  
Dissertation: *Double Gamma Decay in  $^{90}\text{Zr}$* . Adviser: Otaviano A. M. Helene (retired)

*Bachelor of Science (B.S.):*

Physics, December 1986, University of São Paulo, São Paulo, Brazil

**EMPLOYMENT**

- *Chair*: Department of Physics, University of Central Florida (May 2016 – May 2021).
- *Professor*: Department of Physics, University of Central Florida (since August 2010).
- *Associate Professor*: Department of Physics, University of Central Florida (December 2003 – July 2010).
- *Visiting Associate Professor*: Department of Physics, Duke University, Durham, NC (December 2002 – December 2003).
- *Associate Professor*: Department of Physics, Pontifical Catholic University of Rio de Janeiro (PUC-RJ) (October 2002 – December 2005). On leave December 2002 – December 2005.
- *Assistant Professor*: Department of Physics, PUC-RJ (August 1996 – September 2002).
- *Post-doctoral Fellow*: NORDITA, Denmark (September 1994 – July 1996).
- *Research Assistant*: Department of Physics, Massachusetts Institute of Technology (March – August 1994).

PUBLICATIONS<sup>1</sup>

## Papers in peer-reviewed international indexed journals (105)

126. C. Chamon, A. E. Ruckenstein, E. R. Mucciolo, and R. Canetti, *Circuit complexity and functionality: a thermodynamic perspective*, Proceedings of the National Academic of Sciences (in press).
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124. P. Jouzdani, H. A. Hashim\*, and E. R. Mucciolo, *Quantum Algorithms for State Preparation and Data Classification based on Stabilizer Codes*, Physical Review A **109**, 022602 (2024). 16 pages.
123. J. Nieminen, S. Dhara\*, W.-C. Chiu\*, E. R. Mucciolo, and A. Bansil, *Atomistic modeling of a superconductor-transition-metal dichalcogenide-superconductor Josephson junction*, Physical Review B **107**, 174524 (2023). 16 pages.
122. S. Dhara\*, G. Goldstein<sup>†</sup>, C. Chamon, and E. R. Mucciolo, *Logical Majorana zero modes in a nanowire network*, Physical Review B **107**, 075402 (2023). 12 pages
121. P. Jouzdani, C. W. Johnson, E. R. Mucciolo, and I. Stetcu, *Alternative approach to quantum imaginary time evolution*, Physical Review A **106**, 062435 (2022). 15 pages.
120. C. Chamon, E. R. Mucciolo, and A. E. Ruckenstein, *Quantum statistical mechanics of encryption: Reaching the speed limit of classical block ciphers*, Annals of Physics **446**, 169086 (2022). 30 pages.
119. B. Blue\*, R. Tsuchikawa, A. Ahmadi, Z. Zhang, D. Heligman, S. D. Lough\*, J. Hone, E. R. Mucciolo, and M. Ishigami *Observation of Wigner cusps in a metallic carbon nanotube*, Solid State Communications **353**, 114834 (2022). 3 pages.
118. W. E. Richardson\*, E. R. Mucciolo, and P. K. Schelling, *Resistivity size effect due to surface steps on ruthenium thin films computed with a realistic tight-binding model*, Journal of Applied Physics **130**, 195108 (2021). 12 pages. (Editor's pick, featured at the journal's webpage.)
117. J. P. Santos Pires\*, B. Amorim, A. Ferreira, I. Adagideli, E. R. Mucciolo, and J. M. Viana Parente Lopes, *Breakdown of universality in three-dimensional Dirac semimetals with random impurities*, Physical Review Research **3**, 013183 (2021). 13 pages.
116. J. A. Reyes\*, D. C. Marinescu, and E. R. Mucciolo, *Simulation of quantum many-body systems on Amazon cloud*, Computer Physics Communications **261**, 107750 (2020). 10 pages.
115. S. Dhara\*, A. Hamma, and E. R. Mucciolo, *Quantum coherence in ergodic and many-body localized systems*, Physical Review B **102**, 045140 (2020). 7 pages.
114. L. Zhang\*, J. A. Reyes\*, S. Kourtis, C. Chamon, E. R. Mucciolo, and A. E. Ruckenstein, *Nonuniversal Entanglement Level Statistics in Projection-driven Quantum Circuits*, Physical Review B **101**, 235104 (2020). 7 pages.

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<sup>1</sup>Student and post-doctoral co-authors are indicated with \* and <sup>†</sup>, respectively.

113. K. Barmak, S. Ezzat, R. Gusley, A. Jog, S. Kerdsonpanya, A. Khanya\*, E. Milosevic, W. Richardson\*, K. Sentosun, A. Zangiabadi, D. Gall, W. E. Kaden, E. R. Mucciolo, P. K. Schelling, A. C. West, and K. R. Coffey, *Epitaxial metals for interconnects beyond Cu*. Journal of Vacuum Science and Technology A **38**, 033406 (2020). 11 pages.
112. A. M. C. Souza, G. M. A. Almeida, and E. R. Mucciolo, *Localization properties of a two-channel 3D Anderson model*, Journal of Physics: Condensed Matter **32**, 285504 (2020). 7 pages.
111. S. Kourtis<sup>†</sup>, C. Chamon, E. R. Mucciolo, and A. E. Ruckenstein, *Fast counting with tensor networks*, SciPost Physics **7**, 060 (2019). 18 pages
110. L. Zhang\*, S. Kourtis<sup>†</sup>, C. Chamon, E. R. Mucciolo, and A. E. Ruckenstein, *Ultra-slow dynamics in a translationally invariant spin model for multiplication and factorization*, Physical Review Research **1**, 033001 (2019). 8 pages
109. P. Patil\*, S. Kourtis<sup>†</sup>, C. Chamon, E. R. Mucciolo, and A. E. Ruckenstein, *Obstacles to quantum annealing in a planar embedding of XORSAT*. Physical Review B **100**, 054435 (2019). 11 pages
108. Z.-C. Yang\*, S. Kourtis<sup>†</sup>, C. Chamon, E. R. Mucciolo, and A. E. Ruckenstein, *Iterative compression-decimation scheme for tensor network optimization*. Physical Review E **97**, 033303 (2018). 13 pages
107. V. G. Miranda, E. R. Mucciolo, and C. H. Lewenkopf, *Spin relaxation in disordered graphene: Interplay between puddles and defect-induced magnetism*. Journal of Physics and Chemistry of Solids **128**, 169 (2017). 10 pages (invited)
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105. A. Ahamdi\* and E. R. Mucciolo, *A microscopic formulation of dynamical spin injection in ferromagnetic-nonmagnetic heterostructures*, Physical Review B **96**, 035420 (2017). 15 pages
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101. E. Ridolfi\*, L. R. F. Lima<sup>†</sup>, E. R. Mucciolo, and C. H. Lewenkopf, *Electronic transport in disordered MoS<sub>2</sub> nanoribbons*. Physical Review B **95**, 035430 (2017). 9 pages
100. C. J. Paez<sup>†</sup>, K. DeLello\*, D. Le<sup>†</sup>, A. L. C. Pereira, and E. R. Mucciolo, *Disorder effect on the anisotropic resistivity of phosphorene determined by a tight-binding model*, Physical Review B **94**, 165419 (2016). 10 pages
99. R. Tsuchikawa\*, D. Heligman, Z. Y. Zhang, A. Ahmadi\*, E. R. Mucciolo, J. Hone, and M. Ishigami, *Scattering strength of potassium on a carbon nanotube with known chirality*, Physical Review B **94**, 045408 (2016). 5 pages

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97. Z.-C. Yang\*, C. Chamon, A. Hamma, and E. R. Mucciolo *Two-component structure in the entanglement spectrum of highly excited states*. Physical Review Letters **115**, 267206 (2015). 5 pages.
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89. J. I. Romero\*, E. Vernek, G. B. Martins, and E. R. Mucciolo, *Magnetic field modulated Kondo effect in a single-magnetic-ion molecule*. Physical Review B **90**, 195417 (2014). 5 pages.
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86. P. Jouzdani\*, E. Novais, and E. R. Mucciolo, *Fidelity of the surface code in the presence of a bosonic bath*. Physical Review A **88**, 012336 (2013). 13 pages.
85. C. H. Lewenkopf and E. R. Mucciolo *The recursive Green's function method for graphene*. Journal of Computational Electronics **12**, 203 (2013). 29 pages.
84. C. Chamon and E. R. Mucciolo, *Rényi entropies as a measure of the complexity of counting problems*. Journal of Statistical Mechanics: Theory and Experiment P04008 (2013). 13 pages.
83. E. Novais and E. R. Mucciolo, *Surface code threshold in the presence of correlated errors*. Physical Review Letters **110**, 010502 (2013). 5 pages.

82. A. Patra, S. Singh\*, B. Barin, Y. Lee, J.-H. Ahn, E. del Barco, E. R. Mucciolo, and B. Özyilmaz, *Dynamic spin injection into chemical vapor deposited graphene*. Applied Physics Letters **101**, 162407 (2012). 4 pages.
81. L. R. F. Lima\*, F. A. Pinheiro, R. B. Capaz, C. H. Lewenkopf, and E. R. Mucciolo, *The role of the disorder range and electronic energy in the graphene nanoribbons perfect transmission*. Physical Review B **86**, 205111 (2012). 6 pages.
80. H. Y. Lee\*, E. R. Mucciolo, G. Bouzerar, and S. Kettemann, *RKKY interactions in graphene: dependence on disorder and gate voltage*. Physical Review B **86**, 205427 (2012). 7 pages.
79. L. Arrachea, E. R. Mucciolo, C. Chamon, and R. B. Capaz, *Microscopic model of a phononic refrigerator*, Physical Review B **86**, 125424 (2012). 9 pages.
78. C. Chamon and E. R. Mucciolo, *Virtual parallel computing and a search algorithm using matrix product states*, Physical Review Letters **109**, 030503 (2012). 4 pages.
77. S. Kettemann, E. R. Mucciolo, I. Varga, and K. Slevin, *Kondo-Anderson transitions*, Physical Review B **85**, 115112 (2012). 16 pages.
76. H. Y. Lee\*, J. H. Kim, E. R. Mucciolo, G. Bouzerar, and S. Kettemann, *RKKY interaction in disordered graphene*, Physical Review B **85**, 075420 (2012). 5 pages.
75. A. L. C. Pereira, C. H. Lewenkopf, and E. R. Mucciolo, *Correlated random hopping disorder in graphene at high magnetic fields: Landau level broadening and wave function symmetries*, Physical Review B **84**, 165406 (2011). 9 pages.
74. C. Chamon, E. R. Mucciolo, L. Arrachea, and R. B. Capaz, *Heat pumping in nanomechanical systems*, Physical Review Letters **106**, 135504 (2011). 4 pages.
73. A. Ferreira<sup>†</sup>, J. Viana Gomes<sup>†</sup>, J. Nilsson<sup>†</sup>, E. R. Mucciolo, N. M. R. Peres, and A. H. Castro Neto, *A unified description of the dc conductivity of monolayer and bilayer graphene based on resonant scatterers*, Physical Review B **83**, 165402 (2011). 22 pages.
72. J. Katoch\*, J. H. Chen<sup>†</sup>, R. Tsuchikawa\*, C. W. Smith\*, E. R. Mucciolo, and M. Ishigami, *Uncovering the dominant scatterer in graphene sheets on SiO<sub>2</sub>*, Physical Review B **82**, Rapid Comm. 081417 (2010). 4 pages.
71. E. R. Mucciolo and C. H. Lewenkopf, *Disorder and electronic transport in graphene*, Journal of Physics: Condensed Matter **22**, 273201 (2010). 12 pages.
70. D. C. B. Valente\*, E. R. Mucciolo, and F. K. Wilhelm, *Decoherence by electromagnetic fluctuations in double-quantum-dot charge qubits*, Physical Review B **82**, 125302 (2010). 12 pages.
69. E. Novais, E. R. Mucciolo, and H. U. Baranger, *Bound on quantum computation time: Quantum error correction in a critical environment*, Physical Review A **82**, Rapid Comm. 020303 (2010). 4 pages.
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67. S. Kettemann, E. R. Mucciolo, and I. Varga, *Critical metal phase at the Anderson metal-insulator transition with Kondo impurities*, Physical Review Letters **103**, 126401 (2009). 4 pages.

66. E. R. Mucciolo, C. H. Lewenkopf, and A. H. Castro Neto, *Conductance quantization and transport gap in disordered graphene nanoribbons*, Physical Review B **79**, 075407 (2009). 5 pages.
65. G. González\*, M. N. Leuenberger, and E. R. Mucciolo, *Kondo effect in single-molecule magnet transistors*, Physical Review B **78**, 054445 (2008). 12 pages.
64. C. H. Lewenkopf, E. R. Mucciolo, and A. H. Castro Neto, *Numerical studies of conductivity and Fano factor in disordered graphene*, Physical Review B **77**, Rapid Comm. 081410 (2008). 4 pages.
63. E. Novais<sup>†</sup>, E. R. Mucciolo, and H. U. Baranger, *Hamiltonian formulation of quantum error correction and correlated noise: Effects of syndrome extraction in the long-time limit*, Physical Review A **78**, 012314 (2008). 18 pages
62. A. Zhuravlev<sup>†</sup>, I. Zharekeshev, E. Gorelov\*, A. I. Lichtenstein, E. R. Mucciolo, and S. Kettmann, *Nonperturbative scaling theory of free magnetic moment phases in disordered metals*, Physical Review Letters **99**, 247202 (2007). 4 pages.
61. M. Hentschel, D. C. B. Valente\*, E. R. Mucciolo, and H. U. Baranger, *Improving intrinsic decoherence in multi-quantum-dot charge qubits*, Physical Review B **76**, 235309 (2007). 12 pages.
60. E. R. Mucciolo and C. H. Lewenkopf, *Spin pumping with quantum dots*, International Journal of Nanotechnology **4**, 482–495 (2007).
59. S. Kettmann and E. R. Mucciolo, *Disorder-quenched Kondo effect in mesoscopic electronic systems*, Physical Review B **75**, 184407 (2007). 17 pages.
58. M. D. Hogue\*, E. R. Mucciolo, and C. I. Calle, *Triboelectric, corona, and induction charging of insulators as a function of pressure*, Annual Meeting of the Electrostatics Society of America, Berkeley, CA, June 2006 [Journal of Electrostatics **65**, 274–279 (2007)].
57. E. Novais<sup>†</sup>, E. R. Mucciolo, and H. U. Baranger, *Resilient quantum computation in correlated environments: A quantum phase transition perspective*, Physical Review Letters **98**, 040501 (2007). 4 pages.
56. E. R. Mucciolo, C. H. Lewenkopf, and L. I. Glazman,  *$g$  factors and discrete energy level velocities in nanoparticles*, Physical Review B **74**, Rapid Comm. 121402 (2006). 4 pages.
55. M. N. Leuenberger and E. R. Mucciolo, *Berry phase oscillations of the Kondo effect in single-molecule magnets*, Physical Review Letters **97**, 126601 (2006). 4 pages.
54. S. Kettmann and E. R. Mucciolo, *Free magnetic moments in disordered metals*, JETP Letters **83**, 240–245 (2006) [Pis'ma v ZhETF, **83**, 284 (2006)].
53. M. Thorwart, J. Eckel\*, and E. R. Mucciolo, *Non-Markovian dynamics of double quantum dot charge qubits due to acoustic phonons*, Physical Review B **72**, 235320 (2005). 6 pages.
52. S. Vorojtsov\*, E. R. Mucciolo, and H. U. Baranger, *Phonon decoherence of a double quantum dot charge qubit*, Physical Review B **71**, 205322 (2005). 7 pages
51. M. D. Hogue\*, E. R. Mucciolo, C. I. Calle, and C. R. Buhler, *Two-phase equilibrium model of insulator-insulator contact charging with electrostatic potential*, Annual Meeting of the Electrostatics Society of America, Rochester, NY, June 2004 [Journal of Electrostatics **63**, 179–188 (2005)].

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49. M. Martínez-Mares<sup>†</sup>, C. H. Lewenkopf, and E. R. Mucciolo, *Statistical fluctuations of pumping and rectification currents in quantum dots*, Physical Review B **69**, 085301 (2004). 12 pages.
48. S. Vorojtsov\*, E. R. Mucciolo, and H. U. Baranger, *Spin qubits in multi-electron quantum dots*, Physical Review B **69**, 115329 (2004). 6 pages
47. E. R. Mucciolo, C. Chamon, and C. M. Marcus, *Adiabatic quantum pump of spin-polarized current*, Physical Review Letters **89**, 146802 (2002). 4 pages.
46. W. A. M. Morgado and E. R. Mucciolo, *Numerical simulation of vibrated granular gases under realistic boundary conditions*, Physica A **311**, 150–168 (2002).
45. F. M. Cucchietti\*, C. H. Lewenkopf, E. R. Mucciolo, H. M. Pastawski, and R. O. Vallejos, *Measuring the Lyapunov exponent with quantum mechanics*, Physical Review E **65**, 046209 (2002). 9 pages.
44. A. M. F. Rivas<sup>†</sup>, E. R. Mucciolo, and A. Kamenev, *Numerical study of quasiparticle lifetime in quantum dots*, Physical Review B **65**, 155309 (2002). 8 pages.
43. C. Chamon, E. R. Mucciolo, and A. H. Castro Neto, *P-wave pairing and ferromagnetism in the metal-insulator transition in 2D*, Physical Review B **64**, 245115 (2001). 12 pages.
42. C. Chamon and E. R. Mucciolo, *Non-perturbative saddle point for the effective action of disordered and interacting electrons in 2D*, Physical Review Letters **85**, 5607–5610 (2000).
41. I. V. Krive, A. S. Rozhavsky, E. R. Mucciolo, and L. E. Oxman, *Electron transport through a mesoscopic metal-CDW-metal junction*, Physical Review B **61**, 12835–12341 (2000).
40. L. E. Oxman, E. R. Mucciolo, and I. V. Krive, *Transport in finite incommensurate Peierls-Fröhlich systems*, Physical Review B **61**, 4603–4607 (2000).
39. M. A. M. Aguiar, H. S. Brandi, B. Koiller, and E. R. Mucciolo, *Chaos in one-dimensional lattices under intense laser fields*, European Physical Journal B **14**, 329–335 (2000).
38. R. O. Vallejos<sup>†</sup>, C. H. Lewenkopf, and E. R. Mucciolo, *Coulomb blockade conductance peak fluctuations in quantum dots and the independent particle model*, Physical Review B **60**, 13682–13694 (1999).
37. I. V. Krive and E. R. Mucciolo, *Transport properties of quasiparticles with fractional exclusion statistics*, Physical Review B **60**, 1429–1432 (1999).
36. A. M. Ozorio de Almeida, C. H. Lewenkopf, and E. R. Mucciolo, *Semiclassical limit of universal parametric density correlations*, Physical Review E **58**, 5693–5703 (1998).
35. R. O. Vallejos<sup>†</sup>, C. H. Lewenkopf, and E. R. Mucciolo, *Coulomb blockade peak spacing fluctuations in deformable quantum dots: a further test of Random Matrix Theory*, Physical Review Letters **81**, 677–680 (1998).
34. E. R. Mucciolo<sup>†</sup>, R. A. Jalabert, and J.-L. Pichard, *Parametric statistics of the scattering matrix: From metallic to insulating quasi-unidimensional disordered systems*, Journal de Physique I **17**, 1267–1296 (1997).

33. H. Bruus<sup>†</sup>, C. H. Lewenkopf, and E. R. Mucciolo<sup>†</sup>, *Parametric correlation of Coulomb blockade conductance peaks in chaotic quantum dots*, Proceedings of the XVII Nordic Semiconductor Meeting, Trondheim, Norway, June 1996 [Physica Scripta T**69**, 13–16 (1997)].
32. H. S. Brandi, B. Koiller, and E. R. Mucciolo<sup>†</sup>, *Laser-induced quantum chaos in 1-D crystals*, Laser Physics **7**, 481–484 (1997).
31. P. A. Lee, E. R. Mucciolo<sup>†</sup>, and H. Smith, *Dephasing time of composite fermions*, Physical Review B **54**, 8782–8788 (1996).
30. H. Bruus<sup>†</sup>, C. H. Lewenkopf, and E. R. Mucciolo<sup>†</sup>, *Parametric conductance correlation for irregularly shaped quantum dots*, Physical Review B **53**, 9968–9983 (1996).
29. E. R. Mucciolo<sup>†</sup>, B. D. Simons<sup>†</sup>, A. V. Andreev\*, and V. N. Prigodin, *Sensitivity of quantum chaotic wave function intensities to change in external perturbations*, Physical Review Letters **75**, 1360–1363 (1995).
28. E. R. Mucciolo\*, V. N. Prigodin, and B. L. Altshuler, *Statistical properties of level widths and conductance peaks in a quantum dot*, Physical Review B **51**, 1714–1721 (1995).
27. E. R. Mucciolo\*, R. B. Capaz\*, B. L. Altshuler, and J. D. Joannopoulos, *Manifestations of quantum chaos in electronic band structures*, Physical Review B **50**, 8245–8251 (1994).
26. E. R. Mucciolo\*, B. S. Shastry, B. D. Simons<sup>†</sup>, and B. L. Altshuler, *Exact dynamical correlations of the  $1/r^2$  model*, Physical Review B **49**, 15197–15211 (1994).
25. S. P. Tsai\*, E. R. Mucciolo\*, and O. Helene, *Relocation of multichannel spectra*, Nuclear Instruments and Methods A **345**, 538–540 (1994).
24. E. R. Mucciolo\* and X.-G. Wen, *Optical properties of an antiferromagnetic ordered TP-violating phase*, Physical Review B **47**, 12172–12177 (1993).
23. E. R. Mucciolo\* and O. Helene, *Double gamma decay in  $^{90}\text{Zr}$* , Physical Review C **40**, 2403–2405 (1989).
22. E. R. Mucciolo\* and O. Helene, *Energy measurements of gamma rays from  $^{133}\text{Ba}$  decay: Consistency with cascade crossover relations*, Nuclear Instruments and Methods A **256**, 153–160 (1987).

#### Papers in non-indexed conference proceedings (7)

21. W. E. Richardson\*, P. K. Schelling, and E. R. Mucciolo, *Beyond Cu Interconnects: A Scalable Approach to Model Transport in Nanowires*, TechCon 2019 annual conference, Austin, TX.
20. S. Kettemann and E. R. Mucciolo, *Dephasing of conduction electrons and the quenching of the Kondo effect in disordered metals*, VI Rencontres du Vietnam, Hanoi, Vietnam, August 2006 [*Nanophysics, from Fundamentals to Applications*, edited by D. Mailly, T. Martin, N. van Hieu, B. Placais, and J. Trần Thanh Vân (The Gioi Publishers, 2007), p. 105–110].
19. E. R. Mucciolo, S. Vorojtsov\*, and H. U. Baranger, *Phonon decoherence in quantum dot qubits*, Conference on Quantum Information and Computation III, Orlando, FL, March 2005 [Proceedings of the SPIE Security and Defense Symposium, edited by E. J. Donkor, A. R. Pirich, and H. E. Brandt, **5815**, p. 53–61].



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17. L. E. Oxman and E. R. Mucciolo, *Universality of conductance in mesoscopic junctions and chiral anomaly*, Proceedings of the II Workshop on Electronic Transport in Mesoscopic Systems, Mérida, Venezuela, September 1999 [Rev. Mex. Fis. **45** S1, 64–68 (2001)].
16. B. Koiller, E. R. Mucciolo, H. S. Brandi, and M. A. M. de Aguiar, *Electrons in one-dimensional lattices under laser fields: Quantum and classical chaotic behavior*, Proceedings of the International Workshop on Collective Excitations in Fermi and Bose Systems, Serra Negra, Brazil, September 1998 [edited by C. A. Bertulani, L. F. Canto, and M. S. Hussein (World Scientific, 1999), p. 246–263].
15. P. A. Lee, E. R. Mucciolo<sup>†</sup>, and H. Smith, *Lifetime of composite fermions*, XXXI Rencontres de Moriond, Les Arcs, France, January 1996 [*Correlated Fermions and Transport in Mesoscopic Systems*, ed. T. Martin, G. Montambaux, and J. Trân Thanh Vân (Editions Frontiers, 1996), p. 417–419].

### Book chapters (2)

14. E. Novais<sup>†</sup>, E. R. Mucciolo, and H. U. Baranger, *Hamiltonian Methods in Quantum Error Correction and Fault Tolerance*, in *Quantum Error Correction*, edited by D. Lidar and T. Brun (Cambridge University Press, 2013). p. 585–611.
13. E. R. Mucciolo, *Adiabatic spin pumping with quantum dots*, in *CFN Lectures on Functional Nanostructures*, edited by C. Röthig, G. Schön, and M. Vojta (Springer Verlag, Heildeberg, 2011). p. 125–144.

### Lecture notes (4)

12. E. R. Mucciolo, *Introduction to Quantum Information Processing* (108 pages), undergraduate course taught at UCF (2022-2024).
11. E. R. Mucciolo, *Introduction to Quantum Computation* (64 pages), slides used in a graduate course on quantum computation, Spring 2005, Department of Physics, UCF.
10. E. R. Mucciolo, *Chaos and Interactions in Quantum Dots* (10 pages, in Portuguese), Proceedings of the VII Brazilian School on Electronic Structure, Goiânia, Brazil, July 2000.
9. E. R. Mucciolo, *Theory of Phase Transitions and the Renormalization Group* (93 pages, in Portuguese), graduate course on statistical mechanics, August 2000, Department of Physics, PUC-RJ.

### Books (1)

8. E. R. Mucciolo, *Introduction to Quantum Information Processing* (Taylor & Francis, in press).

### Unpublished preprints and papers under review (4)

7. U. E. Usturali\*, C. Chamon, A. E. Ruckenstein, and E. R. Mucciolo, *A Matrix Product State Representation of Boolean Functions*, arXiv:2505.01930.

6. R. Canetti, C. Chamon, E. R. Mucciolo, and A. E. Ruckenstein, *Towards general-purpose program obfuscation via local mixing*. Accepted to the Theory of Cryptography Conference (TCC 2024). [eprint.iacr.org/2024/006](https://eprint.iacr.org/2024/006).
5. C. Chamon, J. Jakes-Schauer, E. R. Mucciolo, and A. E. Ruckenstein, *Encrypted Operator Computing: a novel scheme for computation on encrypted data*, arXiv:2203.08876.
4. J. A. Reyes<sup>†</sup>, S. Dhara<sup>\*</sup>, and E. R. Mucciolo, *Machine learning regression for operator dynamics*, arXiv:2102.11868.

### Patents (3)

3. E. Mucciolo and C. Chamon, *Techniques for Securely Executing Code that Operates on Encrypted Data on a Public Computer*. US Patent 11,461,435 (October 4, 2022).
2. C. Chamon, E. Mucciolo, A. Ruckenstein, Z.-C. Yang<sup>\*</sup>, *Systems and Methods for Universal Reversible Computing*, Patent Pub No. US 2019/012134 A1 (April 25, 2019).
1. C. Chamon and E. Mucciolo, *Systems and Methods for Virtual Parallel Computing using Matrix Product States*, US Patent No. 9355363 B2 (May 31, 2016); Pub. No. US2014/0223147 A1 (August 7, 2014).

## FUNDING AND RESEARCH GRANTS

### Department of Energy, Basic Energy Sciences, USA (1)

29. *Design, Control and Application of Next-Generation Qubits*, grant DE-SC0019275.  
PI: A. Bansil (Northeastern University). Co-PIs: C. Chamon (Boston University), A. Feiguin (Northeastern University), L. Fu (MIT), E. Mucciolo (UCF), and Q. Yan (Temple University). Amount: \$3,540,000 (October 2018 – September 2021). Participation: 10%.

### Office of Naval Research, USA (1)

28. *Physical Limitations of Quantum Information Processing*, grant #10024674.  
PI: E. Mucciolo (UCF). Co-PI: H. Baranger (Duke University). Amount: \$400,000 (October 2008 – August 2013). Participation: 60%.

### Air Force Office of Scientific Research, USA (1)

27. *Thermoelectric phenomena in quasi 1-dimensional metals*. PI: K. Coffey (UCF). Co-PIs: W. Kaden (UCF), P. Schelling (UCF), and E. Mucciolo (UCF). Amount: \$255,166 (December 2017 – March 2020). Participation: 25%. Subaward from Columbia University.

### National Science Foundation, USA (9)

26. *Collaborative Research: GCR: Towards a Physics-Inspired Approach to Computation on Encrypted Data*, Award OIE 2428488. PI: E. Mucciolo (UCF). Collaborators: R. Canetti, C. Chamon, A. Ruckenstein (Boston University), Tim Riley (Cornell). Amount at UCF: \$209,368 (September 2024 – August 2026). Participation: 100%.

25. *EAGER: Collaborative Research: Tensor Network Methods for Quantum Simulations*, Award CCF 1844434. PI: E. Mucciolo (UCF); Collaborators: C. Chamon and A. Ruckenstein (Boston University). Amount at UCF: \$109,222 (October 2018 – September 2020). Participation: 100%.
24. *E2CDA: Type I: Collaborative Research: Interconnects Beyond Cu*. Award ECCS 1740228. PI: K. Coffey (UCF). Co-PIs: T. Jiang, W. Kaden, P. Schelling, and E. Mucciolo (UCF). Amount: \$234,497 (September 2017 – August 2021). Participation: 20%. Jointly sponsored by the Semiconductor Research Corporation.
23. *AF: Small: Is the Simulation of Quantum Many-Body Systems Feasible on the Cloud?* Award CCF 1525943. PI: P. Wocjan (UCF). Co-PIs: D. Marinescu (UCF) and E. Mucciolo (UCF). Amount: \$385,434 (August 2015 – July 2018). Participation: 25%.
22. *Spin Injection and Manipulation in Graphene-based Spintronics Devices*. Award ECCS 1402990. PI: E. del Barco (UCF). Co-PI: E. Mucciolo (UCF). Amount: \$360,000 (June 2014 – May 2017). Participation: 35%.
21. *Robustness of Topological Quantum Memories*. Award CCF 1117241. PI: E. Mucciolo (UCF). Amount: \$223,000 (July 2011 – June 2015). Participation: 100%. REU supplement: \$16,000 (August 2014).
20. *The Origin of Resistance in Nanotubes: Semi-classical to Quantum Transport in One-Dimension*. Award DMR 1006230. PI: M. Ishigami (UCF). Co-PI: E. Mucciolo (UCF). Amount: \$225,000 (July 2010 – June 2013). Participation: 25%.
19. *Molecular Spintronics with Single-Molecule Magnets*. Award ECCS 1001755. PI: E. del Barco (UCF). Co-PI: E. Mucciolo (UCF). Amount: \$400,000 (May 2010 – April 2013). Participation: 30%.
18. *Is Resilient Quantum Computing in Solid-State Systems Possible?* Award CCF 0523603. PI: E. Mucciolo (UCF). Co-PI: D. Marinescu (UCF). Amount: \$200,000 (August 2005 – July 2009). Participation: 60%.

#### University of Central Florida, USA (2)

17. *Quantum-Computing-Assisted Density Functional Theory* (February 2025). Internal seed grant. PI: E. Mucciolo. Co-PI: Volodymyr Turkowski. Amount: \$9,320.79. Participation: 50%.
16. *Decoherence, Scalability, and Fault-Tolerant Quantum Computation in Solid-State Systems* (November 2005). Supplemental funds provided to the NSF award CCF 0523603 by the UCF I<sup>2</sup>Lab. PI: E. Mucciolo. Co-PI: D. Marinescu. Amount: \$16,000. Participation: 50%.

#### FAPERJ, Brazil (The State of Rio de Janeiro Research Foundation) (4)

15. *Transport Properties in Electronic Mesoscopic Systems* (March 2001). Grant for supporting a short-term visiting professor at PUC-RJ. PI: E. Mucciolo (PUC-Rio). Amount: R\$2,460 (US\$1,200 approx.).
14. *Mesoscopic Systems: Phase Coherence, Chaos, Disorder, and Interactions in Micro and Nano Electronic Structures* (May 2000). Young Scientist Award. PI: E. Mucciolo (PUC-Rio). Amount: R\$14,500 (US\$7,900 approx.).

13. *XXI National Condensed Matter Physics Meeting of the Brazilian Physical Society* (May 1998). Grant for partial support of the event. PI: E. Mucciolo (PUC-Rio). Amount: R\$19,500 (US\$17,000 approx.).
12. *Renewal of the Computer Network at the Physics Department of the Pontifical Catholic University: Connecting Teaching and Research* (February, 1998). Grant for the acquisition of equipment and materials. PI: E. Mucciolo (PUC-Rio). Amount: R\$10,000 (US\$8,800 approx.).

### Participation in other group funded projects in Brazil and in the USA (11)

11. NSF *Collaborative Research: Advancing Quantum Education by Adaptively Addressing Misconceptions in Virtual Reality*, Award IIS 2302816. PI: R. McMahan (UCF). Senior personnel: E. Mucciolo (UCF). Amount: \$451,673 (August 2023 – July 2026). Participation: 13%.
10. NIST SBIR Phase I: *Establishing the Security of Ciphers Designed Using Statistical Physics Principles to Enable Direct Computation on Encrypted Data*. Award 70NANB22H188. PI: L. Veltri (USEncryption). Senior personnel: C. Chamon and E. Mucciolo (USEncryption). Amount: \$99,999 (October 2022 – March 2023).
9. NSF SBIR Phase I: *Enabling Computation on Encrypted Data on the Cloud and Beyond*. PI: L. Veltri (USEncryption). Senior personnel: C. Chamon and E. Mucciolo (USEncryption). Amount: \$224,800 (October 2019 - September 2020).
8. *Spin Transport in Quantum Dots*, (February 2006). American Physical Society Travel Grant Award Program. PI: C. Lewenkopf (UERJ, Brazil). Co-PI: E. Mucciolo (UCF). Amount: \$2,000.
7. *A High-Performance Computer Cluster for Nanophysics Simulations* (January, 2005). UCF Presidential Initiative – Equipment Funding Award (matched by startup funds from the PIs). PI: K. Busch (UCF). Co-PI: E. Mucciolo (UCF). Amount: \$34,500.
6. *Research Network on Nanostructured Materials* (December, 2001). Project involving several Brazilian institutions, sponsored by CNPq. PI: I. Baumvol (UFRG). Amount: R\$750,000 (US\$300,000 approx.). Participation: Co-PI.
5. *Nanoscience Institute* (October 2001 – September 2004). Project involving several Brazilian institutions, sponsored by the Brazilian Ministry for Science and Technology. PI: A. S. Chaves (UFMG). Amount: R\$ 4,600,000 (US\$ 1,700,000 approx.). Participation: one of many Co-PIs.
4. *Experimental Study and Theoretical Modeling of Energy Losses in Air-Conditioning* (August 2001 – July 2003). Project sponsored by Light S.A., the local electricity distribution company in Rio de Janeiro. PI: E. Bezerra (Light S.A.). Co-PIs: E. Mucciolo (PUC-RJ), C. Cesar (UFRJ), and M. Cruz (UFRJ). Amount: R\$350,000 (US\$140,000 approx.).
3. *Materials for Nanotechnology* (September 2001 – August 2004). Project involving several institutions in the Rio de Janeiro State, sponsored by FAPERJ. PI: H. Brandi (UFRJ). Amount R\$450,000 (US\$170,000 approx.). Participation: Co-PI.
2. Co-PI, *Decoherence Effects in Mesoscopic Systems* (August 2000). Award by the Trina-tional Cooperation Program of the Vitae Foundation. PI: C. Lewenkopf (UERJ). Co-PI: E. Mucciolo. Amount R\$ 18,000 (US\$ 10,000 approx.).

1. Co-PI, *Hamiltonian Systems: Chaos and Quantization* (January 1998 – December 2003). “Center of Excellence” (PRONEX) award by the Brazilian Federal Government. PI: A. M. Ozorio de Almeida (CBPF). Co-PIs: C. Lewenkopf (UERJ), E. Mucciolo (PUC-RJ), M. A. M. Aguiar (UNICAMP), and M. C. Nemes (UFMG). Amount: R\$250,000 (US\$220,000 approx.).

## INVITED PRESENTATIONS

### In conferences, workshops, schools, and panels (36)

114. *Fast Scrambling with Quantum Circuits and Circuit Thermodynamics*, Dirac Quantum Discussions Symposium, Florida State University and NHML, Tallahassee, FL (February 2025).
113. Panelist: *Venture Lab Stakeholders: Faculty and Venture Capitalists*, 1st Annual UCF Innovative Symposium (March 2024).
112. Panelist: *The Intern: Undergraduate Student Breakout Session*, Quantum Information Science Career Fair 2023, virtual (September 2023).
111. Panelist: *Building the Quantum Computer & Supply Chains*, National Quantum Literacy Conference, Annapolis, MD (October 2022).
110. *Machine Learning Regression for Many-Body Operator Dynamics*, Conference on Real-space Simulations of Topological Matter and Disordered Materials, Institute of Physics, U.K., virtual (October 2021).
109. *Quantum vertex model for reversible classical computing*, IBM Quantalab Quantum Computing School, INL, Braga, Portugal (October 2018).
108. *Solving computational problems by annealing a planar quantum vertex model*, 6th Mexican Meeting on Mathematical and Experimental Physics, El Colegio Nacional, Mexico City, Mexico (September 2016).
107. *Critical delocalization of chiral zero energy modes in graphene*, International Symposium on Recent Developments on 2D Materials Research: Theory and Experiment, University of York, York, U.K. (May 2016).
106. Panelist: *Professional development and undergraduate career options to mentees*, National Mentoring Community & Bridge Program Conference, American Physical Society, Miami, FL (October 2015).
105. *Irreversibility and entanglement spectrum statistics in quantum circuits and many-body systems*, 38th Condensed Matter Physics Annual Meeting, Brazilian Physical Society, Foz do Iguaçu, Brazil (May 2015).
104. *Unified description of electronic transport in graphene based on resonant scatterers*, Asia-Pacific Centre for Theoretical Physics: Conference on Localisation, Pohang, South Korea (August 2011).
103. *Resonant impurity scatterers and dc conductivity in graphene*, Boston-Area Carbon Nanoscience Annual Workshop, Boston, MA, USA (June 2011).
102. *Probing the dominant scatterers in graphene via hydrogenation*, Advanced Materials Science Workshop on Metal-Insulator Transitions in Disordered and Magnetic Systems, Pohang, South Korea (September 2010).

101. *For how long is it possible to quantum compute?*, Workshop on Quantum Algorithms, Computational Models, and Foundations of Quantum Mechanics, University of British Columbia, Vancouver, Canada (July 2010)
100. *Kondo effect in single-molecule magnets*, 3rd Workshop on Current Trends in Molecular and Nanoscale Magnetism, Orlando, FL, USA (June, 2010)
99. *Physical limitations of quantum information processing*, Workshop on Quantum Information, Office of Naval Research, Shepherdstown, WV, USA (May 2010).
98. *Phonon decoherence in semiconductor charge qubits*, 13th International Conference on Vibrations at Surfaces, University of Central Florida, Orlando, USA (March 2010)
97. *Numerical methods and simulations for graphene-based electronic devices*, Workshop on Centre for Carbon Science and Technology, National University of Singapore, Singapore (September 2009).
96. Two talks: *Conductivity of disordered graphene*; *Kondo effect of magnetic molecules*. Advanced Materials Science Workshop on Correlations in Disordered Materials, POSTECH, Pohang, South Korea (August 2009).
95. *Physical limitations of quantum information processing*, Workshop on Quantum Information, Office of Naval Research, Washington DC, USA (May 2009).
94. *Electronic transport in disordered graphene sheets and nanoribbons*, American Physical Society March Meeting, Pittsburgh, USA (March 2009).
93. *Universal and non-universal scaling of the conductivity in disordered graphene*, Workshop on Delocalization Transitions and Multicriticality, Isaac Newton Institute for Mathematical Sciences, Gregynog Hall, UK (November 2008).
92. *Conductance suppression in disordered graphene nanoribbons*, Workshop on the Physics of Graphene, Aspen Center for Physics, Aspen, CO, USA (June 2008).
91. *Carbon-based devices for high-speed microelectronics*, group leader presentation, Workshop on Carbon Electronics for Radio-Frequency Applications, DARPA, Arlington, VA, USA (April 2007).
90. *Coherent spin transport and spin pumping*, lecture, CFN Summer School on Nanoelectronics, Bad Herrenalb, Germany (September 2005).
89. *Adiabatic pumping of spin currents with quantum dots*, American Physical Society March Meeting, Montreal, Canada (March 2004).
88. *Ferromagnetic instability in two-dimensional disordered metals*, Workshop on Strange Metals, ICCMP, Brasília, Brazil (November 2002).
87. *Quantum dot spin pump*, Workshop of the Nanostructured Materials Research Network - Theory Group, São Paulo, Brazil (October 2002).
86. *Adiabatic spin pumping*, Workshop on Mesoscopic Physics and Electron Interaction, ICTP, Trieste, Italy (June 2002).
85. *Adiabatic spin pumping with quantum dots*, Workshop of the Nanostructured Materials Research Network - Semiconductor Group, Belo Horizonte, Brazil (April 2002).

84. *Chaos and interactions in quantum dots*, lecture, VII Brazilian School on Electronic Structure Goiânia, Brazil (July 2000).
83. *Electronic transport in CDW-metal junctions*, II Workshop on Electronic Transport in Mesoscopic Systems, Mérida, Venezuela (September 1999).
82. Lecture on Mesoscopic Physics, II Workshop on Electronic Transport in Mesoscopic Systems, Mérida, Venezuela (September 1999).
81. *Electronic transport in CDW-metal junctions*, International Conference on Spin Ladders and Low-Dimensional Strongly Correlated Systems, ICCMP, Brasília, Brazil (September 1999).
80. Workshop on Nonlinear Dynamics and Chaos in Physical and Biological Systems, São Paulo, Brazil (October 1997).
79. VIII Brazilian Workshop on Semiconductor Physics, Águas de Lindóia, Brazil (February 1997).

#### In universities and research institutions (78)

78. *Quantum Computing, Information Scrambling, and Thermodynamics: What do they have in common?*, colloquium, Department of Physics, University of Miami, Miami, FL, USA (September 2024).
77. *Atomistic modeling of superconductor-TMD-superconductor Josephson junctions*, seminar, Institute of Physics, Fluminense Federal University, Niterói, Brazil (May 2023).
76. *Alternative approach to quantum imaginary time evolution*, virtual seminar, Institute of Physics, Fluminense Federal University, Niterói, Brazil (October 2022).
75. *Extended Temporal Prediction of Expectation Values via Machine Learning*, virtual seminar, Institute of Physics, Federal University of Uberlandia, Uberlandia, Brazil (September 2021).
74. *New Developments at the Interface between Physics and Computer Science*, seminar, Department of Physics, Emory University, Atlanta, GA, USA (December 2018).
73. *Entanglement Complexity and Irreversibility in Classical and Quantum Circuits*, seminar, Department of Physics, Instituto Superior Técnico, Lisbon, Portugal (November 2018).
72. Two lectures: *Quantum Computation: How it works, What it can do, and Where it stands*; and *New Developments at the Interface between Physics and Computer Science*; School of Engineering, University of Porto, Porto, Portugal (November 2018).
71. *New Developments and Ideas at the Interface between Physics and Computer Science*, colloquium, Department of Physics, Florida State University, Tallahassee, FL, USA (October 2017).
70. *Solving Classical Computational Problems by Annealing a Planar Quantum Vertex Model*, University of York, York, U.K. (May 2016).
69. *Irreversibility and Entanglement Spectrum Statistics in Quantum Circuits and Many-Body Systems*, Fluminense Federal University, Niteroi, Brazil (June 2015).
68. *Irreversibility and Entanglement Spectrum Statistics in Quantum Circuits and Many-Body Systems*, Brazilian Center of Physics Research, Rio de Janeiro, Brazil (June 2015).

67. *Irreversibility and entanglement spectrum statistics in quantum circuits*, Naval Research Laboratory, Washington DC, USA (October 2014).
66. *Irreversibility and entanglement spectrum statistics in quantum circuits*, Perimeter Institute, Waterloo, Canada (September 2014).
65. *A new approach to teaching physics*, colloquium, Institute of Physics, Fluminense Federal University, Niterói, Brazil (June 2013).
64. *Rényi entropies, counting problems, and matrix computing*, Institute of Physics, Fluminense Federal University, Niterói, Brazil (May 2013).
63. *Virtual parallel computing with matrix product states*, Federal University of ABC, Santo André, Brazil (July, 2012).
62. *Virtual parallel computing with matrix product states* University of São Paulo, São Paulo, Brazil (July, 2012).
61. *Virtual parallel computing with matrix product states* Fluminense Federal University, Niterói, Brazil (June, 2012).
60. *Virtual parallel computing with matrix product states* Federal University of Rio de Janeiro, Rio de Janeiro, Brazil (June, 2012).
59. *Virtual parallel computing with matrix product states* Naval Research Laboratory, Washington D.C., USA (June 2012).
58. *Resonant scatterers and electronic transport in graphene*, School of Physics, Trinity College, Dublin, Ireland (December 2011).
57. *A unified description of electronic transport in graphene based on resonant scatterers*, National High Magnetic Field Laboratory, Tallahassee, FL, USA (November 2011).
56. *Quantum information processing: What is new and what is possible*, colloquium, Department of Physics and Astronomy, University of North Carolina, Chapel Hill, NC, USA (November 2010).
55. Two seminars: *Long-time dynamics of quantum computers in the presence of correlated errors*; and *Kondo and Coulomb blockade effects in single molecule magnets*. Department of Physics and Astronomy, University of British Columbia, Vancouver, Canada (March 2009).
54. *Electronics with single-molecule magnets*, colloquium, Department of Physics, University of Ohio, Athens, OH, USA (October 2008).
53. *Electronic transport in disordered graphene*, seminar, Department of Physics, University of Regensburg, Regensburg, Germany (July 2008).
52. *Electronics and spintronics with single-molecule magnets*, seminar, Institute of Applied Physics, Hamburg University, Hamburg, Germany (July 2008).
51. *Simulations and numerical modeling of electronics transport in disordered graphene*, seminar, Department of Physics, University of California, San Diego, CA, USA (May 2008).
50. *Simulations and numerical modeling of electronics transport in disordered graphene*, seminar, Department of Physics, University of California, Riverside, CA, USA (May 2008).
49. *Simulations and numerical modeling of electronics transport in disordered graphene*, seminar, Department of Physics, Stanford University, Palo Alto, CA, USA (May 2008).



48. *Graphene*, lecture, Department of Chemistry, University of Central Florida, *Orlando, FL, USA* (April, 2008).
47. *Conductivity and Fano factor in disordered graphene*, seminar, Department of Physics, Duke University, *Durham, NC, USA* (January 2008).
46. *Electronics with single-molecule magnets*, seminar, Institute for Theoretical Solid-State Physics, Karlsruhe University, *Karlsruhe, Germany* (June 2007).
45. *Electronics with single-molecule magnets*, seminar, Institute of Theoretical Physics, University of Hamburg, *Hamburg, Germany* (June 2007).
44. A series of three seminars on my research activities, Max-Planck Institute for the Physics of Complex Systems, *Dresden, Germany* (June 2007).
43. *Quantum oscillations in the conductance of a single-molecule magnet*, seminar, Department of Physics. Ohio State University, *Columbus, OH, USA* (May 2007).
42. *Electronics with single-molecule magnets*, seminar, Department of Physics. Boston University, *Boston, MA, USA* (February 2007).
41. *Electronics with single-molecule magnets*, colloquium, Physics Department, University of Waterloo, *Waterloo, Canada* (February 2007).
40. *Berry phase oscillations of the Kondo effect in single-molecule magnets*, seminar, Department of Physics. University of Florida, *Gainesville, FL, USA* (January 2007).
39. *Berry phase oscillations of the Kondo effect in single-molecule magnets*, seminar, Theory Division, Los Alamos National Laboratory, *Los Alamos, NM, USA* (May 2006).
38. *Phonon decoherence in quantum dot qubits*, seminar, Institute of Physics, State University of Rio de Janeiro, *Rio de Janeiro, Brazil* (December 2005).
37. *Quantum spin pumping*, seminar, Condensed Matter Science Division, Oak Ridge National Laboratory, *Oak Ridge, TN, USA* (November 2005).
36. *Quantum spin pumping*, seminar, Department of Physics, Karlsruhe University, *Karlsruhe, Germany* (May 2005).
35. *Quantum spin pumping*, seminar, Department of Physics, Ludwig-Maximilians University, *Munich, Germany* (May 2005).
34. *Quantum spin pumping*, seminar, Department of Physics, Heinrich-Heinz University, *Düsseldorf, Germany* (May 2005).
33. *Quantum spin pumping*, seminar, Institute for Theoretical Physics, Hamburg University, *Hamburg, Germany* (May 2005).
32. *Exploring non-equilibrium phenomena in quantum dots, wires, and alike*, colloquium, Department of Physics, University of Central Florida, *Orlando, FL, USA* (April 2005).
31. *Quantum pumping*, colloquium, Department of Physics, Florida State University, *Tallahassee, FL, USA* (January 2005).
30. *Quantum adiabatic pumping of charge, spin, and heat*, seminar, Department of Physics, New York University, *New York, NY, USA* (October 2004).
29. *Quantum adiabatic pumping of charge, spin, and heat*, seminar, Brazilian Center for Physical Research, *Rio de Janeiro, Brazil* (June 2004).

28. *Quantum spin pumping*, colloquium, Department of Physics, University of Central Florida, Orlando, FL, USA (March 2003).
27. Seminar, Institute of Physics, University of Campinas, *Campinas, Brazil* (October 2002).
26. *Quantum spin pumping*, seminar, Department of Physics, Pontifical Catholic University, *Rio de Janeiro, Brazil* (September 2002).
25. Colloquium, Department of Physics, University of Central Florida, *Orlando, FL, USA* (February 2002).
24. Colloquium, Department of Physics, Ohio University, *Athens, OH, USA* (February 2002).
23. Seminar, Department of Physics, Duke University, *Durham, NC, USA* (February 2002).
22. Colloquium, Department of Physics, Pontifical Catholic University, *Rio de Janeiro, Brazil* (April 2001).
21. Seminar, Institute of Physics, University of Campinas, *Campinas, Brazil* (August 2000).
20. Colloquium, Institute of Physics, Fluminense Federal University, *Niterói, Brazil* (May 2000).
19. Seminar, Institute of Physics, Federal University of Rio de Janeiro, *Rio de Janeiro, Brazil* (October 1999).
18. Seminar, Institute of Physics, State University of Rio de Janeiro *Rio de Janeiro, Brazil* (June 1999).
17. Seminar, Institute of Physics, University of Campinas, *Campinas, Brazil* (November 1998).
16. Seminar, Linear Accelerator Laboratory, University of São Paulo, *São Paulo, Brazil* (May 1998).
15. Colloquium, Department of Physics, Federal University of Minas Gerais, *Belo Horizonte, Brazil* (November 1997).
14. Seminar, Department of Physics, Federal University of Minas Gerais, *Belo Horizonte, Brazil* (November 1997).
13. Seminar, Institute of Physics, University of Rio de Janeiro, *Rio de Janeiro, Brazil* (May 1997).
12. Seminar, Institute of Physics, Fluminense Federal University, *Niterói, Brazil* (April 1997).
11. Seminar, Brazilian Center for Physical Research, *Rio de Janeiro, Brazil* (November 1996).
10. Seminar, Department of Physics, Pontifical Catholic University, *Rio de Janeiro, Brazil* (October 1996).
9. Seminar, University of Essen, *Essen, Germany* (June 1996).
8. Seminar, Institute of Physics, University of São Paulo, *São Paulo, Brazil* (March 1996).
7. Seminar, Institute of Physics, University of Campinas, *Campinas, Brazil* (March 1996).
6. Seminar, Department of Physics, Pontifical Catholic University, *Rio de Janeiro, Brazil* (March 1996).
5. Seminar, Institute of Physics and Astronomy, Aarhus University, *Aarhus, Denmark* (May 1995).

4. Seminar, Max-Planck Institute for Solid State Physics, *Stuttgart, Germany* (January 1995).
3. Seminar, Max-Planck Institute for Nuclear Physics, *Heidelberg, Germany* (January 1995).
2. Seminar, NORDITA & Niels Bohr Institute, *Copenhagen, Denmark* (October 1994).
1. Seminar, Institute of Physics, University of São Paulo, *São Paulo, Brazil* (May 1988).

## PROFESSIONAL EXPERIENCE

### Teaching

- At the Department of Physics, University of Central Florida:
  17. PHY 6667, *Quantum Field Theory I* (Fall 2024)
  16. PHY 4932/3650, *Quantum Information Processing* (Spring 2022, Spring 2023, Spring 2024, Spring 2025)
  15. PHY 4932, *Special Topics: Advanced Mechanics* (Fall 2015).
  14. PHY 3320, *Mechanics I* (Spring 2015, Spring 2016).
  13. PHY 2048, *Physics for Engineers and Scientists I* – SCALE-UP mode: Fall 2011, Spring 2012, Fall 2012, Spring 2013, Fall 2013, Spring 2014).
  12. PHY 5524, *Statistical Physics* (Spring 2011).
  11. PHY 3513, *Thermodynamics and Statistical Physics* (Fall 2010).
  10. PHY 4605, *Wave Mechanics II* (Spring 2009, Spring 2010).
  9. PHY 4604, *Wave Mechanics I* (Fall 2008, Fall 2009).
  8. PHY 6624, *Quantum Mechanics II* (Spring 2007, Spring 2008).
  7. PHY 5606, *Quantum Mechanics I* (Fall 2006, Fall 2007).
  6. PHY 6939, *Graduate Research Seminar* (Summer 2006).
  5. PHY 2048, *Physics for Engineers and Scientists I* (Spring 2006, Fall 2023).
  4. PHZ 5405, *Condensed Matter Physics* (Fall 2005).
  3. PHY 5650, *Special Topics: Introduction to Quantum Computation* (Spring 2005).
  2. PHY 6246, *Classical Mechanics* (Fall 2004, Fall 2015).
  1. PHY 5524, *Statistical Physics* (Spring 2004).
- At the Department of Physics, Duke University:
  1. PHYSICS 307, *Introduction to Condensed Matter* (Fall 2003). Graduate level.
- At the Department of Physics, Pontifical Catholic University:
  10. *Quantum Mechanics II* (2002). Senior level.
  9. *Quantum Mechanics I* (2001 and 2002). Senior level.
  8. Laboratory, *Physics 2* (2000). Freshman level.
  7. Laboratory, *Physics 4* (2000). Sophomore level.
  6. Laboratory, *Physics 3* (four consecutive semesters, from 1998 to 2001; also in 2002). Sophomore level.
  5. *Electromagnetism III* (1999 and 2001). Graduate level.
  4. *Statistical Mechanics* (2000). Graduate level.
  3. *Statistical Physics* (1998, 1999, 2000). Senior level.

2. *Electronic Transport in Mesoscopic Systems* (taught jointly with C. Lewenkopf) (1997). Graduate level.
  1. *Physics 4* (four successive semesters, from 1996 to 1998). Sophomore level.
- At the Department of Physics, Massachusetts Institute of Technology:
    1. Teaching Assistant of Prof. Boris Altshuler in the graduate course *Solid State Theory* (Fall 1991).

### Supervision of graduate students at UCF

24. Shantanu Chaudhary, Ph.D. student. Project: *Matrix product state and quantum many-body systems* (May — August 2024).
23. Maxine Khumalo, Ph.D. candidate. Project: *Universal vs. non-universal entanglement spectrum statistics in quantum circuits* (since January 2024).
22. Andrew Silverman, Ph.D. student. Project: *Supercurrents in novel Josephson junctions* (since August 2023).
21. Arslan Hashim, Ph.D. candidate. Project: *Quantum neural networks* (since January 2023).
20. Suman Mandal, Ph.D. candidate. Project: *Origins of barren plateaux in variational quantum algorithms* (since August 2021).
19. João Pedro dos Santos Pires, visiting Ph.D. student. Project: *Disordered Weyl semimetals* (June – July 2019). Currently a consultant with Deloitte, Portugal.
18. William Richardson, Ph.D. dissertation *An Atomistic Approach to Large Scale Transport: An Investigation of the Resistivity-Size Effect in Thin Films with Realistic Disorder* (April 2024). Co-advised by P. K. Schelling.
17. Sayandip Dhara, Ph.D. dissertation: *Methods and Characterization of Topological and Disordered-Induced Protection of Coherence in Quantum Systems* (December 2022). Currently a post-doctoral associate at Virginia Tech.
16. George Davila, M.S. student. Project: *Compressing DNA databases with matrix product states* (March 2017 – July 2018).
15. Tyler Campbell, Ph.D. student. Project: *Computation via thermal annealing of vertex models* (May 2016 – October 2016).
14. Justin Reyes, Ph.D. dissertation: *Tensor Network States: Optimizations and Applications in Quantum Many-Body Physics and Machine Learning* (July 2020). Currently an assistant professor, Florida Polytech.
13. Angel Martínez Argüello, visiting Ph.D. student. Project: *Are entanglement fluctuations universal?* (March 2015). Currently at the Benemérita Universidad Autónoma de Puebla, Mexico.
12. Emilia Ridolfi, visiting Ph.D. student. Project: *An accurate tight-binding model for MoS<sub>2</sub>* (September – November 2014). Currently a post-doctoral associate at the Université Libre de Bruxelles, Belgium.

11. Daniel Bonior, Ph.D. dissertation: *Mathematical foundations of adaptive quantum processing*; co-advisor: Keye Martin (October, 2018). Research scientist at the Naval Research Laboratory in Washington DC.
10. Leandro Lima, visiting Ph.D. student. Project: *Recursive electronic transport calculations in interacting and disordered wires* (August – October 2012). CNPq fellow from the Federal University of Rio de Janeiro, Brazil. Currently an assistant professor at UFRRJ, Brazil.
9. Sabine Pelton, Ph.D. dissertation: *Solving constraint satisfaction problems with matrix product states* (August 2017). Ridgerunner at Shenandoah National Park.
8. Guilherme Martins, visiting M.S. student. Project: *Fidelity decay of a spin lattice in a correlated environment* (November – December 2011). SBF-APS fellowship recipient from the Federal University of Sergipe, Brazil. Ph.D. in physics from UFS, Brasil; currently an assistant professor at UFA, Brazil.
7. Amin Ahmadi, Ph.D. dissertation: *Charge and spin transport in low-dimensional materials* (April 2017). Currently working at a big data startup in Sweden.
6. Javier Romero. Ph.D. dissertation: *Electronic transport in single-molecule magnet transistors* (July 2014). APS-SBF fellowship recipient (July 2013). Currently working toward an MS degree in STEM Education at Tufts University.
5. Pejman Jouzdani. Ph.D. dissertation: *Fault tolerance in topological quantum memories* (November 2014). Scientist at KLA in CA.
4. Sabine Pelton. M.S. thesis: *Spin pumping with double quantum dots* (March 2012).
3. Diego C. Valente. Ph.D. dissertation: *Decoherence in Semiconductor Solid State Quantum Computers* (October 2009). Lecturer at University of Connecticut.
2. James McCracken. M.S. thesis: *Decoherence in Quantum Dot Charge Qubits: the Role of Electromagnetic Fluctuations*. (April 2006). Currently a consultant in the Washington DC area.
1. Michael D. Hogue. Ph.D. dissertation: *Insulator-Insulator Contact Charging as a Function of Pressure* (November 2005). Member of the technical staff at the NASA Kennedy Space Center, FL (retired).

### Supervision of undergraduate students at UCF

19. Bradford Geiger, Physics major. Project: *Quantum entanglement of photonic modes*. (January – April 2025).
18. Isaac Restrepo, Physics major. Project: *Scrambling and learning in T-doped Clifford circuits*. (since May 2024).
17. Jacob Halpern, Physics major. Project: *Ginzburg-Landau modeling of multi-contact Josephson junctions*. (May 2024 – April 2025).
16. Alexa McKeay, B.S. in Physics, 2024. Project: *Universal vs. non-universal entanglement spectrum statistics in quantum circuits*. (January – July 2024). Graduate student at Ohio State University.
15. Zehra Baqri, Physics major. Project: *Scrambling and universality in tree-like quantum circuits*. (since August 2023).

14. Maximillian Daughtry, Physics major. Project: *Barren plateau in variational quantum algorithms*. (August 2023 – July 2024).
13. Luke Anderson, Computer Engineering major. Project: *Machine learning for quantum error correction*. (August 2023 – December 2023).
12. Mikhail Gotmare, Physics major. Project: *Matrix product state quantum circuit simulator*. (January – April 2023).
11. Jesse Jones Johnson, B.S. in Physics, 2023. Project: *Quantum error correction via machine learning*. (January – April 2023).
10. Peter Smucz, B.S. in Physics, 2022. Project: *Alternative approach to quantum imaginary time evolution*. (May – July 2022).
9. Antonett Nunez del Prado, B.S. in Physics, 2019. Project: *Entanglement complexity in SAT problems*. (August 2015 – May 2019). Currently a Ph.D. student at UCLA.
8. Kursti DeLello, B.S. in Physics, 2016. Projects: *Phase transitions in counting problems; Electronic structure and electronic transport in phosphorene – Honors in the Major thesis*. (February 2014 – May 2016). Currently a Ph.D. student at Cornell University.
7. Alexander Stanforth, B.S. in Physics, 2017. Projects: *A Monte-Carlo method for evaluating the permanent of Hermitian matrices; Statistical properties of random permutation gates and Fidelity threshold in the surface code over multiple cycles* (January 2013 – April 2017). Currently a medical physics assistant at Emory Healthcare, Atlanta, GA.
6. Richard Bergmann, B.S. in Physics, 2015. Project: *Variational matrix product state solution of spin chain problems*. (August 2013 – May 2015). Software engineer with COLSA.
5. Thomas Evaskis, Physics & Math major. Project: *Phase transitions in the #2-SAT class of problems* (August – December 2012).
4. Evelyn Strunk, B.S. in Physics, 2013. Project: *Percolation and electrical conductance in graphene oxide* (May 2012 – May 2013). Currently at Lockheed-Martin, Orlando, FL.
3. Stephen Wood, Physics major. Project: *Artificial magnetic fields and strain in graphene* (August – December 2010).
2. Jonathan Edmiston, Physics major. Project: *Transfer-matrix calculation of conductance in graphene nanoribbons* (August – December 2009). Currently at Qorvo, Orlando, FL.
1. William Cole, B.S. in Physics, 2008. Project: *Weak localization in disordered graphene* (August 2007 – May 2008). Currently a researcher at Microsoft Q Station in Santa Barbara, CA.

### Supervision of students at the Department of Physics, PUC-RJ

5. Bernardo S. Fernandes, *undergraduate student* (CNPq-PIBIC fellow). Project: *Development of a laboratory kit for the observation of the conductance quantum* (August 1999 – July 2000).
4. Marcelo S. Schiaffino, *undergraduate student* (CNPq-PIBIC fellow). Project: *Self-consistent confining potential in semiconductor heterostructures* (March 1999 – February 2000). Key account manager at BICS Telecomm in Brazil.

3. Kenjiro K. Gomes, *undergraduate* student (CNPq-PIBIC fellow). Project: *Description of half-filled Landau levels* (August 1997 – July 1999). Project: *Superconductivity in disordered metallic grains* (March – July 2000). M.S. dissertation (CAPES fellow) : *Spontaneous Spin Polarization in Disordered Quantum Dots* (July 2002). Co-founder, Monad, San Francisco, CA.
2. Ana Luiza Cardoso Pereira, *undergraduate* student (CNPq-PIBIC fellow). Project: *Transport and spectral fluctuations in mesoscopic structures* (August 1997 – March 1999). Faculty member at UNICAMP-Limeira. Winner of the L’Oreal Prize for Brazilian Women in Sciences.
1. Marco e Silva de Melo Távora (CAPES and CNPq fellow). M.S. dissertation: *Vortex States in Unconventional Superconductors* (September 2002). Founder, Principia Technologies, Brazil.

### Supervision of postdoctoral fellows

1. Justin Reyes, NSF Mathematical and Physical Sciences Ascending Postdoctoral Research fellow (January 2022 – July 2023). Currently an assistant professor at Florida Polytech.
2. Carlos Paez, FAPESP fellow (September 2015 – June 2016). visiting from UNICAMP, Brazil. Currently an assistant professor in Colombia.
3. Alejandro M. F. Rivas, FAPERJ fellow (May 1999 – April 2001). Currently a member of the technical staff at the Tandem National Laboratory, Argentina.

### Administrative activities

- At UCF:
  - Chair/Head, Department of Physics (May 2016 – May 2021).
  - Director of the Physics Graduate Program (December 2004 – July 2006)
- At the Department of Physics, PUC-RJ:
  - Director of the Physics Graduate Program (December 2000 – August 2002)

### Institutional service

- At UCF:
  - Chair of the Theoretical Quantum Computing faculty search committee, Department of Physics (since April 2025).
  - Member of the Associate Dean of Research search committee, College of Sciences (April 2024).
  - Chair of the Theoretical Condensed Matter faculty search committee, Department of Physics (January – May 2024).
  - Member of the College of Sciences Technology Advisory Committee (since May 2023).
  - Member of the Attosecond Theory faculty search committee, Department of Physics (December 2022 – April 2023).
  - Co-chair, UCF Research Cyberinfrastructure Advisory Committee (since October 2022).

- Coordinator, computer cluster room, Department of Physics (since January 2022).
  - Member of the Lecturer search committee, Department of Physics (January – May 2022).
  - Member of the Global Initiatives Advisory Committee Meeting (since September 2020).
  - Member of the Quantum Optics faculty search committee, College of Optics and Photonics (Fall 2020).
  - Member of the AI + QC work group (November 2020 – April 2021).
  - Member of the Chief Information Officer search committee (September – November 2020).
  - Member of the university committee “What Will UCF Be Known For” (Fall 2019).
  - Member of the Associate Dean search committee, College of Sciences (July 2018).
  - Chair of the Psychology Department Chair search committee (February – April 2018)
  - Co-organizer of the Freshman Physics Seminar (Fall 2015 and Spring 2016).
  - Chair of the Physics Education Research faculty search committee (November 2015 – April 2016)
  - Chair of the Ultrafast Experimental Condensed Matter Physics faculty search committee (November 2014 – March 2015)
  - Member of the UCF Physics Career Day organizing team; member of the Physics Outreach Committee (2014 – 2015)
  - Member of the Physics Department’s Strategic Planning Committee (September 2011 – 2015).
  - Member of the UCF Graduate Council Policy Committee (September 2009 – March 2011).
  - Member of the UCF Faculty Senate (April 2009 – March 2011).
  - External member of the Chemistry Annual Evaluations, Procedures and Standards Committee: Criteria Revisions (January 2009).
  - Chair of the Physics Computer and Technology Committee (August 2006 – January 2007)
  - Member of the new Physical Science Building Committee (February 2006 – August 2010)
  - Member of the Physics Annual Evaluations, Procedures and Standards Committee (May 2005 – December 2005; September 2011 – August 2013)
  - Member of the Physics Department Chair search committee (March 2005 – April 2006)
  - Member of the Interdisciplinary Information Science and Technology Laboratory (I2Lab) Steering Committee (December 2004 – August 2006). Member of the fellowship subcommittee.
  - Member of the Physics Graduate Program governance (August 2004 – July 2015).
  - Internal reviewer of grant proposals for limited-submission solicitations.
- At the Department of Physics, PUC-RJ:
    - Member of the Graduate Committee (December 1999 – November 2000)
    - Manager of the computer network (March 1997 – February 2001)
    - Library liaison (November 1996 – February 1999)
    - Member of the Steering Committee (November 1996 – October 1999)
  - Thesis and dissertation committees (excluding of own advisees):



- External member in 6 committees in Brazil (1996 – 2015), 1 in Ireland (2012), and 1 in Germany (2013).
- Member in many tens of committees at UCF (Computer Sciences, Mathematics, Education, Electrical Engineering, Optics and Photonics, and Physics).

### Service to the profession and the community

- Member of the Advisory Board, ExpandQISE Project *Exotic Phases and Applications of Solid-State Qubits* at Howard University (since February 2024).
- Member of the US Department of Energy Quantum Information Science Education Working Group (March 2021).
- Consultant, panelist, editorial, and referee work:
  - *Journal*: Quanta (since January 2023).
  - *Publisher*: Springer – editor of Tracts in Modern Physics book series (since November 2020).
  - *Journal*: Nature Quantum Information (January 2019)
  - *Journal*: IEEE Transactions on Information Theory (December 2015)
  - *Journal*: Synthetic Metals (June 2015)
  - *Publisher*: Cambridge University Press – book proposal reviewer (November 2013)
  - *Journal*: Physica Status Solidi B (October 2013)
  - *Journal*: Carbon (August 2013)
  - *Journal*: Annals of Physics (June 2013)
  - *Journal*: Journal of Computational Electronics (December 2012)
  - *Funding Agency*: CONICYT, the Chilean foundation for science and technology (July 2011)
  - *Journal*: Journal of Magnetism and Magnetic Materials (June 2011)
  - *Journal*: Reports on Progress in Physics (March 2011)
  - *Publisher*: Springer Verlag – book chapter review (August 2010)
  - *Journal*: Small (August 2010)
  - *Journal*: Applied Physics B – Laser and Optics (April 2010)
  - *Journal*: Applied Physics Letters (since September 2009)
  - *Journal*: Journal of Applied Physics (since June 2009)
  - *Journal*: Reviews of Modern Physics (since May 2009)
  - *Journal*: Journal of the American Chemical Society (since April 2009)
  - *Funding Agency*: Office of Basic Energy Sciences, Department of Energy (since April 2009)
  - *Journal*: Nano Research (August 2008)
  - *Journal*: New Journal of Physics (since January 2008)
  - *Journal*: Journal of Physics: Condensed Matter (since August 2007)
  - *Journal*: Nanotechnology (since May 2007)
  - *Journal*: Physica E (May 2006)
  - *Funding Agency*: John Simon Guggenheim Foundation (February 2006)
  - *Journal*: European Journal of Physics B (since February 2006)
  - *Journal*: Europhysics Letters (since September 2005)
  - *Funding Agency*: American Chemical Society Petroleum Research Fund, (August 2005)

- *Funding Agency*: FONCyT, the Argentinean national fund for science and technology (March 2005)
- *Funding Agency*: National Science Foundation (since November 2004)
- *Journal*: Chemical Physics Letters (August 2004)
- *Journal*: Solid State Communications (since December 2003)
- *Government Agency*: The Brazilian Ministry of Education (November 2000)
- *Funding Agency*: FAPESP, the State of São Paulo Research Foundation, Brazil (since August 2000)
- *Journal*: Physics Letters A (since April 1999)
- *Funding Agency*: CNPq, the Brazilian federal agency for the promotion of science and technology (since September 1998)
- *Journal*: Physical Review A, B, E, and Letters (since November 1994)
- Member of the National Mentoring Community program of the American Physical Society (since December 2015).
- Outside Academia:
  - Advisory Board Member, National Quantum Literacy Network (since June 2021)
  - Volunteer, 28th Annual Science Olympiad National Tournament, Orlando, FL (May 2012)
  - Judge, U.S. Army, Navy and Air Force sponsored 46th National Junior Science Humanities Symposium (JSHS), Orlando, FL (May 2008)
  - Member of the Community Council at the Orlando Science Center, Orlando, FL (November 2004 – December 2005)

### Organization of scientific and professional events

9. Local Organizer – National Mentoring Community Annual Meeting, *Orlando, FL*, February, 2020. Jointly organized with the American Physical Society.
8. Local Organizer – Inclusive Graduate Network (IGEN) National Meeting, *Orlando, FL*, October, 2019).
7. Sorting Team Leader – Complex Structured Materials; Focus Session Organizer for Graphene: Structure, Dopants, and Defects (10 sessions). American Physical Society 2011 March Meeting, *Dallas, TX*.
6. Workshop on Quantum Coherent Properties of Spins III, *Orlando, FL*, December 2010. Other members: Enrique del Barco (chairman), Philip Stamp (UBC, Canada), and Stephen Hill (FSU).
5. Sorting Team Leader – Complex Structured Materials. American Physical Society 2010 March Meeting, *Portland, OR*.
4. Workshop on Frontiers in Quantum and Biological Information Processing, *Orlando, FL*, November 2006 (sponsored by the Interdisciplinary Information Science and Technology Laboratory at UCF). Other members of the organizing committee: James Hickman, Michael Leuenberger, Dan Marinescu, and Pawel Wocjan (UCF).

3. School on Mesoscopic Electronics. International Center for Condensed Matter Physics, *Brasília, Brazil*, July 1998. Chairmen: Múcio A. Continentino (UFF, Brazil) and Gilles Montambaux (Université Paris-Sud, France).
2. Latin-American Winter School “Chaos and Quantum Mechanics: Theory and Applications”. *Rio de Janeiro, Brazil*, July 1998. Chairman: Alfredo M. Ozorio de Almeida (CBPF, Brazil).
1. XXI National Meeting of Condensed Matter Physics. *Caxambu, Brazil*, May 1998. Chairman: Sylvio R. A. Canuto (USP).

## AWARDS AND HONORS

- College of Sciences Recognition for Outstanding Instruction, UCF (April 2024).
- Outstanding Referee, Physics Review journals, American Physical Society (February 2022)
- Research Incentive Award, UCF (February 2016, February 2022)
- UCF Scroll and Quill Society (October 2021)
- Teaching Incentive Award, UCF (March 2011)
- Honored Instructor, Class of 2002, Department of Physics, PUC-RJ
- Invited commencement speaker, Class of 2000, Department of Physics, PUC-RJ
- Rio de Janeiro State Young Scientist Award, FAPERJ (March 2000)
- CNPq research fellowship (March 1997 – February 2003)
- CNPq doctorate scholarship (September 1989 – February 1994)
- CAPES doctorate scholarship (March 1989 – August 1989)
- FAPESP graduate scholarship (March 1987 – December 1988)
- FAPESP undergraduate research scholarship (August 1985 – February 1987)

## PARTICIPATION IN SCIENTIFIC SOCIETIES

- Member, American Association for the Advancement of Science (since 2016)
- Member, American Association of Physics Teachers (since 2016)
- Member, European Physical Society (since 2012)
- Founding member, Brazilian Society for Materials Research (2001)
- Fellow, American Physical Society (since 2017; member since 1993)
- Member, Brazilian Physical Society (since 1988)

## VISITING POSITIONS

- Visiting professor, Northeastern University, Burlington, MA (June 3 – 28, 2024).
- Visiting scientist, Institute of Physics, Fluminense Federal University, Niterói, Brazil (May/June, 2013; May/June, 2014; June/July 2015; November/2019).

- Fellow, International Center for Transdisciplinary Studies, Jacob University, Bremen, Germany (July 09 – 30, 2008).
- Visiting scientist, Max-Planck Institute for the Physics of Complex Systems, Dresden, Germany (June 03 – 30, 2007).
- Visiting scientist, Centre d'Études Nucléaire de Bordeaux-Gradignan, France (May – July 1989).

**OTHER POSITIONS**

- Co-Founder, USEncryption, Inc. (Orlando, FL).