

# JOSÉ ACACIO DE BARROS

San Francisco State University

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## ACADEMIC POSITIONS

<b>Director of the School of Liberal Studies</b> San Francisco State University	2022- <i>Present</i>
<b>Director of the School of Humanities and Liberal Studies</b> San Francisco State University	2021-2022
<b>Professor of Liberal Studies (Physical Sciences)</b> San Francisco State University	2018- <i>Present</i>
<b>Interim Director of the School of Humanities and Liberal Studies</b> San Francisco State University	2018-2019
<b>Visiting Scholar, Production Engineering Department</b> Federal University of Rio de Janeiro, Brazil	2016
<b>Associate Professor of Liberal Studies (Physical Sciences)</b> San Francisco State University	2013-2018
<b>Assistant Professor of Liberal Studies (Physical Sciences)</b> San Francisco State University	2007-2013
<b>Visiting Associate Professor of Physics</b> Center for the Study of Language and Information (CSLI) Stanford University	2005-2007
<b>Visiting Associate Professor of Physics</b> Center for the Study of Language and Information (CSLI) Stanford University	1998-2000
<b>Associate Professor of Physics (tenured)</b> Physics Department, Federal University at Juiz de Fora, Brazil	1997-2011
<b>Visiting Researcher, Laboratory for Experimental HEP (Lafex)</b> Brazilian Center for Research in Physics, Brazil	1996-1995
<b>Associate Professor of Physics</b> Federal University of Brazil at Juiz de Fora, Brazil	1995-1997
<b>Physical Sciences Associate Researcher</b> Institute for Mathematical Studies in the Social Sciences (IMSSS) Stanford University	1993-1994
<b>Visiting Postdoctoral Scholar</b> Institute for Mathematical Studies in the Social Sciences (IMSSS) Stanford University	1991-1993

## EDUCATION

<b>Ph.D., Physics</b> Brazilian Center for Research in Physics (CBPF), Brazil	1991
<b>M.S., Physics</b> Brazilian Center for Research in Physics (CBPF), Brazil	1989
<b>B.S., Physics</b> Federal University at Rio de Janeiro (UFRJ), Brazil	1988

## AWARDS AND HONORS

<b>Brazilian Academy of Philosophy, Corresponding Member</b>	2016-Present
<b>Stanford University, Visiting Associate Professor</b> Center for the Study of Language and Information (CSLI)	2005-2007
<b>Stanford University, Visiting Associate Professor</b> Institute for Mathematical Studies in the Social Sciences (IMSSS)	1998-2000
<b>Stanford University, Postdoctoral Fellow</b> Institute of Mathematical Studies for the Social Sciences (IMSSS) Grant from the Coordination for Higher-Education Personnel (Capes, Brazil)	1991-1993

## TEACHING EXPERIENCE

<b>San Francisco State University</b> Liberal Studies Program Taught/developed the following courses: <i>Concepts of the Number System</i> ; <i>Concepts of Physics and Chemistry (GE)</i> ; <i>Mind, Body, and Culture</i> ; <i>Liberal Studies Senior Seminars (interdisciplinary research methods)</i> ; <i>Perspectives on Liberal Studies (interdisciplinary research theory/epistemology)</i> ; <i>Physical Sciences for Elementary School Teachers</i> ; <i>Physics for Elementary School Teachers</i> ; <i>Science and Culture for Future Elementary School Teachers</i>	2007-Present
<b>Federal University at Juiz de Fora, Brazil</b> Physics Department, Institute for Exact Sciences Taught/developed the following courses: <i>Introductory Mechanics (calculus-based)</i> ; <i>Introductory Electricity and Magnetism (calculus-based)</i> ; <i>Special Relativity</i> ; <i>Analytical Mechanics</i> ; <i>Classical Mechanics</i> ; <i>Foundations of Quantum Mechanics</i> ; <i>General Relativity and Cosmology</i> ; <i>Impact of Research on Physics Education</i> ; <i>Physics of the Brain</i> ; <i>Quantum Mechanics</i> ; <i>Statistical Mechanics</i> ; <i>Advanced Classical Mechanics (graduate level)</i> ; <i>Advanced Quantum Mechanics (graduate level)</i> ; <i>Quantum Optics (graduate level)</i>	1995-2011
<b>Stanford University</b> Taught/co-taught/developed the following courses: <i>Mechanics (calculus based)</i> ; <i>Electricity &amp; Magnetism (calculus based)</i> ; <i>Philosophy of Physics: Probability and Relativity (graduate level)</i>	1993-2011
<b>Brazilian Center for Research in Physics (CBPF)</b> Assisted/lectured as a TA the following graduate-level course: <i>Analytical Mechanics</i>	1990

## BOOKS

1. de Barros, J. Acacio, Holik, Federico, & Krause, Décio. (Forthcoming) *Distinguishing Indistinguishables: Differences Between Classical and Quantum Regimes*. Synthese Library, Springer Nature, Switzerland
2. de Barros, J. Acacio & Krause, Décio. (eds.) (2020) *A True Polymath: a Tribute to Francisco Antonio Doria*. Series of the Brazilian Academy of Philosophy vol. 2, College Publications, Rickmansworth, UK
3. de Barros, J. Acacio & Montemayor, C. (eds.) (2019) *Quanta and Mind: Essays on the connection between quantum mechanics and consciousness*. Synthese Library vol. 414, Springer Nature, Switzerland
4. de Barros, J. Acacio, Coecke, B., & Pothos, E. (eds.) (2017) *Quantum Interaction. QI 2016*. Lecture Notes in Computer Science, vol 10106. Springer, Cham

## PEER-REVIEWED PUBLICATIONS

1. de Barros, J.A., Montemayor, C., De Assis, L.P.G., Skokowsky, P., & Perry, J. Constraining Meanings With Contextuality. *Foundations of Science* (2022). <https://doi.org/10.1007/s10699-022-09859-9>
2. Pizlo Z and de Barros JA (2021) The Concept of Symmetry and the Theory of Perception. *Front. Comput. Neurosci.* 15, 681162.
3. Moreira, C., & de Barros, J. A. (2021). Order Effects in Bayesian Updates. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 43(43).
4. de Barros, J. Acacio, Holik, F. (2020). Indistinguishability and negative probabilities. *Entropy*, 22, 0829; doi:10.3390/e22080829
5. de Barros, J. Acacio & Suppes, P. (2020). *Strong Non-Contextual Holism in Quantum Macroscopic States*. South American Journal of Logic. In press.
6. de Barros, J. Acacio, Holik, F., Krause, D. (2019). Indistinguishability and the origins of contextuality in physics. *Philosophical Transactions of the Royal Society A*, 377 (2157), 20190150; doi: 10.1098/rsta.2019.0150
7. de Barros, J. Acacio, Montemayor, C., Klein, S., Chochran, C. (2019). Henry Stapp and the Orthodox Interpretation. *Activitas Nervosa Superior*. DOI 10.1007/s41470-019-00054-z
8. Montemayor, C., de Barros, J. A., & De Assis, L. P. (2019). Implementation, Formalization, and Representation: Challenges for Integrated Information Theory. *Journal of Consciousness Studies*, 26(1-2), 107-132.
9. Passos, M. H. M., Balthazar, W. F., de Barros, J. A., Souza, C. E. R., Khoury, A. Z., & Huguenin, J. A. O. (2018). Classical analog of quantum contextuality in spin-orbit laser modes. *Physical Review A*, 98(6), 062116.
10. de Barros, J. Acacio, Krause, D., & Holik, F. (2017). Contextuality and Indistinguishability. *Entropy* 19(9), 435; doi:10.3390/e19090435.
11. de Barros, J. Acacio & Oas, G. (2017). Can We Falsify the Consciousness-Causes-Collapse Hypothesis in Quantum Mechanics? *Foundations of Physics*. In Press. DOI: 10.1007/s10701-017-0110-7
12. de Barros, J. Acacio, Montemayor, C., & De Assis, L.G. (2016). *Contextuality in the Integrated Information Theory*. In: de Barros, J. Acacio, Coecke, B., & Pothos, E. (eds) *Quantum Interaction. QI 2016*. Lecture Notes in Computer

- Science, vol 10106. Springer, Cham
13. de Barros, J. Acacio, De Assis, L.G., & Bob, P. (2016). *Is Stress Quantum-Like?* In: de Barros, J. Acacio, Coecke, B., & Pothos, E. (eds) Quantum Interaction. QI 2016. Lecture Notes in Computer Science, vol 10106. Springer, Cham
  14. de Barros, J. Acacio, Kujala, J.V., & Oas, G. (2016). Negative Probabilities and Contextuality. *Journal of Mathematical Psychology*, 74, 34–45.
  15. de Barros, J. Acacio, Dzhafarov, E., Kujala, J. & Oas, G. (2015). Measuring Observable Quantum Contextuality. *Lecture Notes in Computer Science*, 9535, 36–47.
  16. Carvalhaes, C. G. & de Barros, J. Acacio (2015). The Surface Laplacian Technique in EEG: Theory and Methods. *International Journal of Psychophysiology*, 97(3),174–188.
  17. de Barros, J. Acacio, & Oas, G. (2014). Negative probabilities and counterfactual reasoning in quantum cognition. *Physica Scripta*, T163, 014008.
  18. Oas, G., de Barros, J. Acacio, & Carvalhaes, C.G. (2014). Exploring non-signalling polytopes with negative probability. *Physica Scripta*, T163, 014034.
  19. de Barros, J. Acacio. (2014). Decision Making for Inconsistent Expert Judgments Using Signed Probabilities. *Lecture Notes on Computer Science*, 8369, 257–269.
  20. Carvalhaes, C.G., de Barros, J. Acacio, Perrau-Guimarães, M., & Suppes, P. (2014). The joint use of the tangential electric field and surface Laplacian in EEG classification. In press, *Brain Topography*, 27(1), 84-94.
  21. de Barros, J. Acacio (2012). Quantum-like model of behavioral response computation using neural oscillators. *BioSystems*, 110, 171–182.
  22. Suppes, P., de Barros, J. Acacio, & Oas, G. (2012). Phase-Oscillator Computations as Neural Models of Stimulus-Response Conditioning and Response Selection. *Journal of Mathematical Psychology*, 56, 95–117.
  23. de Barros, J. Acacio (2011). Comments on ‘There is no Axiomatic system for the quantum theory.’ *International Journal of Theoretical Physics*, 50, 1828–1830.
  24. Vassilieva, E., Pinto, G., de Barros, J. Acacio, & Suppes, P. (2011). Learning Pattern Recognition through Quasi-synchronization of Phase Oscillators. *IEEE Transactions of Neural Networks*, 22, 84-95.
  25. Augsburg, T., & de Barros, J. Acacio (2010). Integrating different modes of inquiry for pre-service teachers. In Chary Rangacharyulu & Emmanuel Haven (Eds.), *Proceedings of the First Interdisciplinary CHESS Interactions Conference*. Singapore: World Scientific. (editor reviewed)
  26. de Barros, J. Acacio, & Suppes, P. (2010). Probabilistic Inequalities and Upper Probabilities in Quantum Mechanical Entanglement. *Manuscrito*, 33, 55-71.
  27. de Barros, J. Acacio, & Suppes, P. (2009). Quantum mechanics, interference, and the brain. *Journal of Mathematical Psychology*, 53, 306-313.
  28. Suppes, P., & de Barros, J. Acacio (2007). Quantum Mechanics and the Brain. In *Quantum interaction: papers from the AAAI spring symposium*. Technical report ss-07-08, 75–82. Menlo Park, CA: AAAI Press.
  29. de Barros, J. Acacio, Corrêa Silva, E. V., Monerat, G. A., Oliveira-Neto, G., Ferreira Filho, L. G., & Romildo\*, Jr., P. (2007). Tunneling probability for the birth of an asymptotically de Sitter universe. *Physical Review D*, 75, 104004.
  30. de Barros, J. Acacio, de Mendonça, J. P. R. F., & Pinto-Neto, N. (2007). Realism

- in Energy Transition Processes: an example from Bohmian Quantum Mechanics. *Synthese*, 154, 349–370.
31. de Barros, J. Acacio, Carvalhaes, C. G., de Mendonça, J. P. R. F., & Suppes, P. (2006). Recognition of Words from the EEG Laplacian, *Brazilian Journal of Biomedical Engineering*, 21, 45-59.
  32. de Barros, J. Acacio, Oliveira Neto, G., & Vale, T. B. (2005). Bohmian Trajectories for Evaporating Black-Holes. *Physics Letters A*, 336, 324-330.
  33. de Barros, J. Acacio (2005). Utilizando métodos de Engajamento Interativo em um Curso de Mecânica Clássica (in Portuguese: Using Interactive Engagement Methods in a Advanced Classical Mechanics Course). *Anais do XVI Simpósio Nacional de Ensino de Física, Niterói, RJ.* (editor reviewed)
  34. Carvalhaes, C. G., de Barros, J. Acacio, & Suppes, P. (2004). O Laplaciano na Análise de Ondas Cerebrais (in Portuguese; The Laplacian as a Tool for the Analysis of Brainwaves). *Anais do 60 Simpósio Brasileiro de Análise*, 2, 243-250.
  35. de Barros, J. Acacio, Remold, J., Vidal\*, F. V., & Barbosa\*, N. A. (2004). Desempenho Conceitual de Alunos do Método de Engajamento Interativo do Curso de Física I da UFJF (in Portuguese: Conceptual Development of Students in an Active Engagement Introductory Physics Course at UFJF). *Anais do IX Encontro de Pesquisa em Ensino de Física, Jaboticatubas, MG, Brazil.*
  36. de Barros, J. Acacio, Remold, J., da Silva\*, G.S.F., & Tagliati, J.R. (2004). Engajamento interativo no curso de Física I da UFJF (in Portuguese; Interactive Engagement in UFJF's Introductory Physics course), *Revista Brasileira de Ensino de Física*, 26, 63–69.
  37. de Barros, J. Acacio, Remold, J., Tagliati, J. R., da Silva, G. S. F., & Matheus-Valle, J. L. (2003). A Aplicação de uma Nova Metodologia de Ensino de Física Usando Aprendizado Colaborativo (in Portuguese; Applying a New Physics-teaching Methodology Using Collaborative Learning). *Coletânea da VI Escola de Verão para Professores de Prática de Ensino de Biologia, Física e Química e Áreas Afins.* Niterói, RJ, Brazil: Editora da UFF.
  38. de Barros, J. Acacio, & Suppes, P. (2001). Probabilistic Results for Six Detectors in a Three-Particle GHZ Experiment. In Bricmont, J., Ghirardi, G, Dürr, D., Petruccione, F, Galavotti, M.C., and Zanghi (Eds.), *Chance in Physics: Foundations and Perspectives: Lecture Notes in Physics Vol. 574*, 213-223. Berlin: Springer Verlag.
  39. de Barros, J. Acacio, & Suppes, P. (2000). Dealing with detector inefficiencies in Greenberger-Horne-Zeilinger-type experiments. *Physical Review Letters* 84, 793–797.
  40. de Barros, J. Acacio, Sagiore Leal, M.A., & Pinto Neto, N. (2000). The Causal Interpretation of the Conformally Coupled Scalar Field Quantum Cosmology. *General Relativity and Gravitation*, 32, 15–39.
  41. de Barros, J. Acacio, Shapiro, I.L., & Pinto-Neto, N. (1999). Quantum gravity correction, evolution of scalar field and inflation. *Classical and Quantum Gravity* 16, 1773–1782.
  42. de Barros, J. Acacio, Pinto-Neto, N., & Sagiore-Leal, M.A. (1998). The Causal Interpretation of Dust and Radiation Fluids Non-Singular Quantum Cosmologies. *Physics Letters A*, 241, 229–239.
  43. de Barros, J. Acacio, & Pinto-Neto, N. (1998). The Causal Interpretation of

- Quantum Mechanics and the Singularity Problem and Time Issue in Quantum Cosmology. *International Journal of Modern Physics D*, 7, 201–214.
44. de Barros, J. Acacio, & Shapiro, I.L. (1997). Renormalization Group Study of the Higher Derivative Conformal Scalar Model. *Physics Letters B*, 412, 242–252.
  45. de Barros, J. Acacio, & Pinto Neto, N. (1997). Comments on the Quantum Potential Approach to a Class of Quantum Cosmological Models. *Classical and Quantum Gravity*, 14, 1993–1995.
  46. de Barros, J. Acacio, & Pinto-Neto, N. (1997). The Causal Interpretation of Quantum Mechanics and the Singularity Problem in Quantum Cosmology. *Nuclear Physics B*, 57, 247–250.
  47. Suppes, P., & de Barros, J. Acacio (1996). Photons, Billiards and Chaos. In P. Weingartner & G. Schurz (Eds.), *Law and Prediction in the Light of Chaos Research: Lecture Notes in Physics Vol. 473*, 189–201. Berlin: Springer Verlag.
  48. Suppes, P., de Barros, J. Acacio, & Oas, G. (1996). A Collection of Probabilistic Hidden-Variable Theorems and Counterexamples. In R. Pratesi & L. Ronchi (Eds.), *Waves, Information and Foundation of Physics: a tribute to Giuliano Toraldo di Francia on his 80th birthday*. Florence: Italian Physical Society.
  49. Suppes, P., de Barros, J. Acacio, & Sant'Anna, A.S. (1996). Violation of Bell's Inequalities with Local Photons. *Foundations of Physics Letters*, 9, 551–560.
  50. Suppes, P., Sant'Anna, A.S., de Barros, J. Acacio (1996). A Pure Particle Theory of the Casimir Effect. *Foundations of Physics Letter*, 9, 213–223.
  51. Ravaglia, R., de Barros, J. Acacio, & Suppes, P. (1995). Computer-Based Advanced Placement for Physics for Gifted Students. *Computers in Physics*, 9, 380–386.
  52. Suppes, P. & de Barros, J. Acacio (1994). Diffraction with Well-Defined Photon Trajectories: a Foundational Analysis. *Foundations of Physics Letters*, 7, 501–514.
  53. da Costa, N.C.A., Doria, F.A., Furtado do Amaral, A. F., & J. Acacio de Barros. (1994). Two Questions on the Geometry of Gauge Fields. *Foundations of Physics*, 24, 783–800.
  54. Suppes, P., & de Barros, J. Acacio (1994). A Random-Walk Approach to Interference. *International Journal of Theoretical Physics*, 33, 179–189.
  55. da Costa, N.C.A., Doria, F.A., & de Barros, J. Acacio (1990). A Suppes Predicate for General Relativity and Set-Theoretically Generic Spacetimes, *International Journal of Theoretical Physics*, 29, 935–961.
  56. Doria, F.A., de Barros, J. Acacio, & Ribeiro da Silva, M. (1987). Noncomputable Functions, Generic Functions and Random Sequences. *Boletim da Sociedade Paranaense de Matemática*, 8, 197–216.

## OTHER PUBLICATIONS

57. de Barros, J. Acacio. (Forthcoming) “On the Wave-function Collapse and Mind-Matter Interaction.” To be submitted to *Copenhagen and Beyond*.
58. de Barros, J.A., & Montemayor, C. (2022). Quantum Mentality: Panpsychism and Panintentionalism. In: Gao, S. (ed) *Consciousness and Quantum Mechanics*. Oxford University Press, Incorporated, United States.
59. de Barros, J.A., Holik, F., Krause, D. (2022). Quantum Identity, Content,

- and Context: From Classical to Non-classical Logic. In: Wuppuluri, S., Stewart, I. (eds) *From Electrons to Elephants and Elections*. The Frontiers Collection. Springer, Cham.
60. de Barros, J. Acacio & Sant'Anna, Adonai (2020). "Classical Fields, Bell's inequalities, and the quantum limit", in de Barros, J. Acacio, Krause, D. (eds). *A True Polymath: a Tribute to Francisco Antonio Doria*. College Publications, Rickmansworth, UK.
  61. Montemayor, C. & de Barros, J. Acacio (2020). "Information and the Hard Problem of Consciousness", in de Barros, J. Acacio, Krause, D. (eds). *A True Polymath: a Tribute to Francisco Antonio Doria*. College Publications, Rickmansworth, UK.
  62. de Barros, J. Acacio (2019). On information, quanta, and context. In Shyam Wuppuluri, Francisco Antonio Doria (eds), *Unravelling Complexity: the life and work of Gregory Chaitin*. World Scientific, Singapore. Forthcoming.
  63. de Barros, J. Acacio, & Montemayor, C. (2019). Quantum Mentality: Panpsychism or Panintentionalism? In Shan Gao (ed), *Quantum Mechanics and Consciousness*, Philosophy of Mind series, Oxford University Press, Oxford.
  64. de Barros, J. Acacio, & Oas, G. (2018). Mapping quantum reality: what to do when the territory does not make sense? In Shyam Wuppuluri, Francisco Antonio Doria (eds), *Map and territory: Exploring the foundations of science, thought and reality*, The frontiers collection, Springer Verlag.
  65. de Barros, J. Acacio (2017). Back-cover for the book *Wheeler*, authored by F. Caruso and J.M.F. Bassalo.
  66. de Barros, J. Acacio, & Oas, G. (2016). Quantum Cognition, Neural Oscillators, and Negative Probabilities. In E. Haven and A. Khrennikov (Eds.), *The Palgrave Handbook of quantum models in social science: applications and grand challenges*. Palgrave MacMillan.
  67. de Barros, J. Acacio (2016). On a Model of Quantum Mechanics and the Mind. In *Dualism, Platonism and Voluntarism: Explorations at the Quantum, Microscopic, Mesoscopic and Symbolic Neural Levels*, O'Nuallain, Sean (ed.), Cambridge Scholars Publishing.
  68. Carvalhaes, C., & de Barros, J. Acacio (2015). *A Review of the Method of Using the Scalp Electric Field in EEG Analysis*. *Cosmos and History: The Journal of Natural and Social Philosophy*, 11(2), 154-159.
  69. de Barros, J. Acacio, Oas, G. (2015). *Quantum Mechanics & the Brain, and some of its Consequences*. *Cosmos and History: The Journal of Natural and Social Philosophy*, 11(2), 146-153.
  70. de Barros, J. Acacio, Oas, G., & Suppes, P. (2015). Negative probabilities and Counterfactual Reasoning on the double-slit Experiment. In J.-Y-Beziau, D. Krause and J.B. Arenhart (Eds.), *Conceptual Clarification: Tributes to Patrick Suppes (1922-2014)*, College Publications, London.
  71. de Barros, J. Acacio, & Oas, G. (2015). Some examples of contextuality in Physics: implications to quantum cognition. In E. Dzhafarov, R. Zhang, and S. M. Jordan (Eds.), *Contextuality, from Quantum Physics to Psychology*. World Scientific.
  72. Oas, G. & de Barros, J. Acacio (2015). A Survey of Physical Principles Attempting to Define Quantum Mechanics. In E. Dzhafarov, R. Zhang, and S. M. Jordan (Eds.), *Contextuality, from Quantum Physics to Psychology*. World

Scientific.

73. de Barros, J. Acacio (2015). Beyond the Quantum Formalism: Consequences of a Neural-Oscillator Model to Quantum Cognition. In *Advances in Cognitive Neurodynamics (IV)*, H. Liljenström (ed.), pp. 401–404. Netherlands: Springer.
74. de Barros, J. Acacio & Oas, G. (2014) Response Selection Using Neural Phase Oscillators. *Foundations and Methods from Mathematics to Neuroscience: Essays Inspired by Patrick Suppes*, Colleen Crangle, Adolfo Garcia de la Sierra, and Helen Longino (eds), CSLI Publications, Stanford University, Stanford, CA.
75. de Barros, J. Acacio (2012). Joint Probabilities and Quantum-Cognition. AIP Conference Proceedings, 1508, 98-109.
76. Remold, J., de Barros, J. Acacio, & dos Santos, G. S. F. (2005) Communities of Practice in Brazil: An Ethnographic Study of Changes to University Physics Instruction. *Preprint UFJF*.
77. de Barros, J. Acacio, Oliveira Neto, G., & Vale, T.B. (2004). The de Broglie-Bohm Interpretation of Evaporating Black-Holes. Unpublished manuscript. arXiv:gr-qc/0404073.
78. de Barros, J. Acacio (1997). Causalidade e Probabilidade (in Portuguese: Causality and Probability). In *Pós-Modernismo: Anticiência e Antihumanismo?*, H. Abdalla-Neto (Ed.), Symposium conducted at the Universidade Católica de Petrópolis, Petrópolis, RJ, Brazil.
79. Suppes, P., de Barros, J. A., & Sant'Anna, A. S. (1996). A Proposed Experiment Showing that Classical Fields Can Violate Bell's Inequalities. arXiv:quant-ph/9606019.
80. Suppes, P., & de Barros, J. Acacio (1995, December 17) A Descoberta dos Raios-X (in Portuguese: The Discovery of the X-Rays). *Jornal Tribuna de Minas: Caderno Leitura*, Juiz de Fora, MG, Brazil
81. de Barros, J. Acacio (1991). *Dois Exemplos de Indecibilidade e Incompletude em Física (Two Examples of Undecidability and Incompleteness in Physics)*. Doctoral dissertation, Brazilian Center for Research in Physics, Rio de Janeiro, Brazil. Dissertation committee: F. A. Doria (chair), N. C. A. da Costa, J. J. Giambiagi, A. F. F. Teixeira, D. Krause, W. C. S. da Silva, J. Helayel-Neto, F. Caruso.
82. Doria, F. A., Furtado do Amaral, A. F., & de Barros, J. Acacio (1990). Noncurvature Solutions for the Bianchi Differential Conditions. CETMAC-5/IDEA, School of Communications, UFRJ, Rio de Janeiro.
83. da Costa, N. C. A., Doria, F. A., & de Barros, J. Acacio (1989). On a Formally Undecidable Statement in Classical Electromagnetic Theory. In C. A. Bertulani and J. Lopes Neto (Eds.), *Encontro de Física Teórica do Rio de Janeiro: Homenagem Póstuma ao Prof. Carlos Márcio do Amaral*. Rio de Janeiro: Editora da UFRJ.
84. de Barros, J. Acacio (1988). *Conjuntos Genéricos Segundo Cohen e suas Aplicações à Física (Generic Sets According to Cohen and its Applications to Physics)*. Master's Thesis, Brazilian Center for Research in Physics, Rio de Janeiro, Brazil. Committee: F. A. Doria, N. C. A. da Costa, M. Dutra Fragoço, A. F. F. Teixeira.
85. Doria, F.A., & de Barros, J. Acacio (1988). Chaos, Entropy, Set-Theoretic Models and Higher Cardinals. In *Atas do Simpósio UNICAMP "Ordem e Desordem."* Unicamp: Editora da Unicamp.



86. Doria, F. A., & de Barros, J. Acacio (1988). On a Set-Theoretic Property Equivalent to the Negation of the Continuum Hypothesis. CETMAC/IDEA, School of Communications, UFRJ, Rio de Janeiro.

## INVITED PRESENTATIONS

1. Where does Quanta Meet the Mind? Invited talk at the Copenhagen and Beyond Conference, Chapman University, Orange, CA, October 18th, 2019
2. Information, Quanta, and Context. Invited talk at the Institute for Mathematical Behavioral and Social Sciences, UC Irvine, Irvine, CA, April 25th, 2019
3. Quantum logic and language. Invited talk at the Workshop in Honor of Francisco Doria, UFRJ/Brazilian Institute of Advanced Studies/Brazilian Academy of Philosophy, Rio de Janeiro, Brazil, December 8–9, 2018.
4. Quantum Cognition and applications of the quantum formalism outside of physics. Invited lectures at the II Advanced School of Quantum Foundation and Quantum Computation, João Pessoa, Brasil, December 3–7, 2018
5. Contextuality, Quantum, and Indistinguishability. Invited lecture at *Purdue Winer Memorial Lectures*, Purdue University, Indiana, November 10th, 2018
6. The Observer's Mind: Contextuality and Consciousness. Invited talk at the Stanford Complexity Group, Stanford University, Stanford, CA, April 12, 2018
7. The Consciousness Causes Collapse Hypothesis in Quantum Mechanics, Center for the Explanation of Consciousness, Stanford University, Stanford, CA, November 3, 2017
8. Quantum Learning. Invited presentation for the Special Session on Applications of the Quantum Formalism Outside Physics, Foundations of Quantum Mechanics and Technology (FQMT), Linneaus University, Växjö, Sweden, June 12-15, 2017.
9. Contextualidade em Mecânica Quântica. Invited talk at the Coordenação de Cosmologia, Astrofísica e Interações Fundamentais, Brazilian Center for Research in Physics, Rio de Janeiro, Brazil, December 19th, 2016.
10. Is the Consciousness Causes Collapse Hypothesis Falsifiable? Invited presentation for the VI Conference on Quantum Foundations : the observer effect in quantum mechanics. Centro Científico Tecnológico CONICET, La Plata, Argentina, December 12–14, 2016.
11. Inconsistências em Mecânica Quântica? Invited talk at the Philosophy Department, Universidade Federal de Santa Catarina (UFSC), Florianópolis, SC, Brazil, November 21, 2016.
12. Consciência e física quântica? Invited talk at the Physics Department, Universidade Federal de Juiz de Fora, November 18, 2016.
13. Contradições em Mecânica Quântica? Invited talk at the Physics Department, Universidade Federal Fluminense, Volta Redonda, Brazil, November 7th, 2016.
14. Consciência e Física Quântica? Invited talk at IBMEC, October 26, 2016.
15. Contextualidade e Economia comportamental. Invited talk at the Programa de Pós-Graduação em Engenharia de Produção, COPPE, Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil, October 20, 2016.
16. Contradições em Mecânica Quântica. Invited talk at the Seminário de Lógica Carioca, organized by the Department of Philosophy, UFRJ, and the Brazilian Academy of Philosophy. Universidade Federal do Rio de Janeiro (UFRJ), Rio

- de Janeiro, Brazil, September 29, 2016.
17. Consciência em Mecânica Quântica. Invited talk at the Physics Department. Universidade Federal Rural do Rio de Janeiro (UFRRJ), Seropédica, Brazil, September 21, 2016.
  18. Quantum Cognition and Rationality. Invited presentation for the Special Symposium on Quantum Probability at the International Conference on Thinking. Brown University, Providence, RI, August 4-6, 2016.
  19. Testing the quantum mind hypothesis. Invited presentation for the Bay Area Philosophy of Science (BAPS) working group. San Francisco, April 22, 2016.
  20. Remembering Patrick Suppes. Invited presentation at the special Symposium in memoriam Patrick Suppes. European Mathematical Psychology Group Meeting (EMPG), University of Padua, Italy, September 01–03, 2015.
  21. Quantum Cognition and Consciousness. Invited presentation at a mini-conference on consciousness at Charles University, Prague, Czech Republic, July 19–20, 2015.
  22. Foundations of Quantum Mechanics. Invited lectures at the *Fundamental Physics School*, organized with the support of FAPESP. State University of São Paulo in São José dos Campos, November 18–21, 2014.
  23. Some Examples of Contextuality in Physics. Invited lecture at *Purdue Winer Memorial Lectures*, Purdue University, Indiana, November 1–3, 2014.
  24. Decision Making for Inconsistent Expert Judgments Using Signed Probabilities. Invited talk at the Mathematical and Computational Cognitive Science (MCCS) area colloquium of the Department of Psychological Sciences, Purdue University, West Lafayette, IN, February 24, 2014.
  25. Signed probabilities as an alternative to rational decision-making: an argument from evolutionary biology. Keynote presentation at the conference “Convergenze Parallele” organized with the support of the Apulian Regional Initiative “Laboratori dal Basso”, University of Salento, Italy, September 10–12, 2013.
  26. Beyond quantum cognition: consequences of a neural-oscillator model of quantum-like behavioral response. Invited presentation at the special section on Quantum Ontology: A New Direction in Modeling the Cognitive Domain at *The 4th International Conference on Cognitive Neurodynamics*, Agora for Biosystems, Sigtuna, Sweden, June 23–27, 2013.
  27. Quantum Cognition. Invited tutorial (four lectures) at the *4th World Congress and School on Universal Logic*, Rio de Janeiro, Brazil, March 29–April, 2013.
  28. Response Selection Using Neural Phase Oscillators. Invited presentation at *A Symposium on the Occasion of Patrick Suppes’s 90th Birthday*, Stanford University, Stanford, California, August 2012.
  29. Joint Probabilities and Quantum Cognition. Invited presentation at *Quantum Theory: Reconsiderations of Foundations – 6*, Linneaus University, Växjö, Sweden, June 2012.
  30. Realism in Energy Transition Processes: an example from Bohmian Mechanics. Invited presentation given at *New Trends in the Foundations of Science*. Universidade Federal de Santa Catarina, Florianópolis, SC, Brazil, April 2002.
  31. Causalidade e Probabilidade (Causality and Probability). Invited presentation at the conference *Pós-Modernismo: Anticiência e Antihumanismo?* (Post-modernism: anti-science and anti-humanism?) Universidade Católica de

- Petrópolis (UCP), Petrópolis, RJ, Brazil, 1997.
32. A New Kind of Dirac Equation. Invited presentation given at the *10th Annual ANPA West Meeting*. Stanford University, Stanford, California, February 1992.

## CONFERENCE PRESENTATIONS

33. Contextuality in the Integrated Information Theory. Paper presented at the *10th International Quantum Interaction Conference*, San Francisco, CA, July 20th to 22nd, 2016.
34. Measuring quantum contextuality. Paper presented at *9th International Quantum Interaction Conference*, Filzbach, Switzerland, July 14th to 18th, 2015.
35. Exploring non-signalling polytopes with negative probability. Paper presented at the *Quantum Theory: from problems to advances*, Linneaus University, Växjö, Sweden, June 2014.
36. Unifying two methods of measuring quantum contextuality. Paper presented at the *Quantum Theory: from problems to advances*, Linneaus University, Växjö, Sweden, June 2014.
37. Decision Making for Inconsistent Expert Judgments Using Negative Probabilities. Paper presented at the *7th International Quantum Interactions Conference (QI2013)*, University of Leicester, Leicester, England, July 2013.
38. Negative probabilities and counterfactual reasoning. Paper presented at the *Quantum Information & Quantum Foundations Workshop*, Linneaus University, Växjö, Sweden, June 2013.
39. Can negative probabilities be useful? Poster presented at the *AAPT Winter Conference*, Ontario, California, February 2012.
40. A Convenient Text: Utilizing An Inconvenient Truth in an Interdisciplinary Gateway Course at San Francisco State University. Panel session (with T. Augsburg, T. Chitewere, M. Luskey, and L. Hennessy) presented at the *Association for Integrative Studies (AIS) 30th annual conference*, Springfield, IL, October 2008.
41. Inquiry in Cultural Context: Interactive Engagement among Brazilian Students. Poster presented at the *AAPT Summer Conference*, Edmonton, Canada, July 2008.
42. Utilizando métodos de Engajamento Interativo em um Curso de Mecânica Clássica (Using Interactive Engagement Methods in an Advanced Classical Mechanics Course). Paper presented at the *XVI Simpósio Nacional de Ensino de Física*, Niterói, RJ, Brazil, June 2005.
43. Analysis of Bohmian Trajectories for a Quantized Black-Hole. Poster presented at the *XXV Encontro Nacional de Física de Partículas e Campos*. Caxambú, MG, Brazil, August 2004.
44. Estimating the Error in the Laplacian of a 64 channel EEG. Poster presented at the *XXVII Encontro Nacional de Física da Matéria Condensada*. Poços de Caldas, MG, Brazil. May 2004.
45. Search for an Ideal Filter to Identify Words in the Laplacian of a 64 Channel EEG. Poster presented at the *XXVII Encontro Nacional de Física da Matéria Condensada*. Poços de Caldas, MG, Brazil, May 2004.
46. Realism in Energy Transition Processes: an example from Bohmian Mechanics. Poster presented at the *XXIV Encontro Nacional de Física de Partículas e*

- Campos, Caxambú, MG, Brazil, October 2003.*
47. Causal interpretation of spherically symmetric evaporating black holes. Poster presented at the *XXIV Encontro Nacional de Física de Partículas e Campos*, Caxambú, MG, Brazil, October 2003.
  48. Identificação de palavras via Laplaciano de um EEG de 64 canais (Identifying Words via a 64 Channel EEG Laplacian). Poster presented at the *XXVI Encontro Nacional de Física da Matéria Condensada*. Caxambú, MG, Brazil, May 2003.
  49. Usando Técnicas de Aprendizado Colaborativo com Alunos de Física, Química e Matemática” (Using Collaborative Learning Techniques with Students of Physics, Chemistry and Mathematics). Poster presented at the *IV Encontro Regional da Sociedade Brasileira de Física em Minas Gerais*, São João Del Rey, MG, Brazil, March 2003.
  50. A Aplicação de uma Nova Metodologia de Ensino de Física Usando Aprendizado Colaborativo (Applying a New Physics-teaching Methodology Using Collaborative Learning). Presentation given at the *VI Escola de Verão para Professores de Prática de Ensino de Biologia, Física e Química*. Niterói, RJ, Brazil, May 2003.
  51. Upper Probabilities in Quantum Mechanics. Poster presented at the *XIX Encontro Nacional de Física de Partículas e Campos*. Caxambú, MG, Brazil, August 1998.
  52. Renormalization Group Study of the Conformal Limit of the Higher Derivative Dilaton. Poster presented at the *XIX Encontro Nacional de Física de Partículas e Campos*. Caxambú, MG, Brazil, August 1998.
  53. The Causal Interpretation of Quantum Mechanics in Quantum Cosmology. Poster presented at the *XVIII Encontro Nacional de Física de Partículas e Campos*. Caxambú, MG, Brazil, October 1997.
  54. A Collection of Probabilistic Hidden-Variable Theorems and Counterexamples. Poster presented at the *XVIII Encontro Nacional de Física de Partículas e Campos*. Caxambu, MG, October 1997.
  55. Interpretação Causal de um Modelo Cosmológico Quântico com Campo Escalar Conformalmente Invariante (Causal Interpretation of a Quantum Cosmological Model with a Conformally Invariant Scalar Field). Poster presented at the *XVIII Encontro Nacional de Física de Partículas e Campos*. Caxambú, MG, Brazil, October 1997.
  56. Violação de Desigualdades Quânticas com Campos Clássicos (Violation of Quantum Inequalities with Classical Fields). Poster presented at the *XVII Encontro Nacional de Física de Partículas e Campos*. Serra Negra, SP, Brazil, September 1996.
  57. Aplicações da Interpretação de Bohm à Cosmologia Quântica (Applying Bohm's Interpretation to Quantum Cosmology). Poster presented at the *XVII Encontro Nacional de Física de Partículas e Campos*. Serra Negra, SP, September 1996.
  58. Um Predicado de Suppes para a Relatividade Geral e Espaços-Tempos Genéricos (A Suppes Predicate for General Relativity and Generic Spacetimes). Poster presented at the *XI Encontro Nacional de Física de Partículas e Campos*. Caxambú, MG, Brazil, September 1990.

## THESES SUPERVISED

1. Tibério Borges Vale, “Intepretação Causal em Buracos Negros Quânticos” (The Causal Interpretation of Quantum Black Holes), Masters thesis, UFJF, 2003.
2. Tibério Borges Vale, “A Interpretação de Bohm na Gravitação Quântica” (Bohm's Interpretation in Quantum Cosmology), Honors thesis, UFJF, 2003.
3. Glauco S. F. da Silva, “Métodos de Engajamento Ativo em Física I” (Interactive Engagement Methods in Physics I), Honors thesis, UFJF, 2003.
4. Ana das Mercês Pelinson, “Ação Efetiva Induzida por Anomalias para Solução Gravitacional Inflacionária” (Effective Action for an Anomaly Induced Gravitational and Inflationary Solution), Masters thesis, UFJF, 1999. (co-supervisor with I. Shapiro).
5. Marco Antônio Sagioro Leal, “Cosmologia Quântica e o Problema da Singularidade Inicial” (in Portuguese; Quantum Cosmology and the Singularity Problem), Masters thesis, UFJF 1998. (co-supervisor with N. Pinto-Neto)
6. Luis Antônio de Castro Henriques, “A Interpretação de Bohm da Mecânica Quântica” (in Portuguese; Bohm's Interpretation of Quantum Mechanics), Honors thesis, UFJF, 1996.

## GRANTS AND SCHOLARSHIPS

1. Project: Effective Action in Quantum Gravity and Consequences to Cosmology, Minas Gerais Research Support Foundation (FAPEMIG) Research Grant, Co-PI, 2001-2003. Collaborators: Ilya Shapiro, Nelson Pinto Neto.
2. Project: Computational Limits to Constructs in Classical and Quantum Theories, Minas Gerais Research Support Foundation (FAPEMIG) Research Grant, PI, 1996-1997. Collaborators: Francisco Doria.
3. Project: Computational Limits (in Turing's sense) in Classical Theories, Special Program for Joint Research (PREVI/UFJF) Research Grant, PI, 1996. Collaborators: Francisco Doria.
4. Project: Ontological Interpretations of Quantum Mechanics and Applications to Quantum Cosmology, Special Program for Joint Research (PREVI/UFJF) Research Grant, PI, 1996. Collaborators: Nelson Pinto Neto.
5. Doctoral Scholarship at the Brazilian Center for Research in Physics, Brazilian National Science and Technology Council (CNPq), 1989-1991
6. Masters Scholarship at Brazilian Center for Research in Physics, Brazilian National Science and Technology Council (CNPq), 1988-1989
7. Scientific Initiation Undergraduate Scholarship, Brazilian National Science and Technology Council (CNPq), 1987-1988

## UNIVERSITY, DEPARTMENT, AND COMMUNITY SERVICE

### Service to the community

1. Associate Editor, *Activitas Nervosa Superior*, Springer, 2017–2020.
2. Board Member, Center for Contextuality in Physics and the Social Sciences, Purdue University. 2015-Present.
3. Council Member, Institute for Quantum Social and Cognitive Science, University of Leicester, UK. 2014-Present.
4. Editorial Board, Series of the Academia Brasileira de Filosofia, College Publications, UK.

### Conferences organized

1. Co-organizer (with Emmanuel Haven, Christoph Gallus, Andrei Khrennikov) of the special session on Applications of quantum formalism outside of physics, part of the Quantum Information Revolution: Impact to Foundations, Växjö, Sweden, 10–13 June, 2019.
2. Co-organizer, Workshop in Honor of Francisco Doria, UFRJ/Brazilian Institute of Advanced Studies/Brazilian Academy of Philosophy, Rio de Janeiro, Brazil, December 8–9, 2018.
3. Co-Chair, International Conference on Quanta and Mind, San Francisco, April 10–11, 2018.
4. Organizing Committee Member, Foundations of Quantum Mechanics and Technology (FQMT) conference, Växjö, Sweden, June 12–15, 2017.
5. Co-organizer (with Emmanuel Haven) of the Special Session on Quantum-like models from cognition to economics and finances, FQMT, Växjö, Sweden, June 15, 2017.
6. Scientific Committee Member, Workshop: Quantum Contextuality in Quantum Mechanics and Beyond, Prague, Czech Republic, June 4–5, 2017.
7. General Chair, 10th International Quantum Interaction Conference, San Francisco State University, July 20–22, 2016.

### Service at SFSU

1. Co-Chair (with L. Hennessy), Liberal Studies Curriculum Committee, 2020-Present.
2. Lecturer Review Committee, School of Humanities and Liberal Studies, Member, 2017-2018.
3. University Senate. Senator representing the CL&CA, 2015-2017.
4. University Senate Curriculum Review & Approval Committee (CRAC). Member, 2015-2017.
5. University Senate Fellowship Committee. Member, 2015-2017.
6. Liberal Studies Student Organization. Faculty Adviser, 2008-2015.
7. University Senate Fellowship Committee. Chair, 2011-2015.
8. College of Liberal & Creative Arts Technology Committee. Member, 2012-2014.
9. University Senate Bachelors Requirement Subcommittee on GE Science. Member, 2011-2014.

10. Hearst/CSU Trustees Award selection committee. Ad hoc committee member, 2011.
11. Merage Foundation selection committee. Ad hoc committee member, 2011.
12. Liberal Studies Sneak Preview Committee. Chair, 2008-2009.
13. Center for Science and Math Education's Steering Committee. Member, 2008-2009.
14. Liberal Studies Teacher Preparation Committee. Member, 2008-2010.
15. Liberal Studies Curriculum Committee. Member, 2007-2010.
16. Senate's Liberal Studies Council. Member, 2007-2011.
17. Faculty Hearing Panel. Member, 2007-2011.

### **Service at UFJF**

1. Juiz de Fora's "Semana do Educador", Municipal Department of Education of Juiz de Fora, Brazil, Workshop on Active Engagement in Physics. Workshop Facilitator, 2003-2004
2. Physics and Physics Teaching Undergraduate Programs. Program Coordinator, 2001-2003
3. University Senate (CU). Senator representing the Physics Programs. 2001-2003.
4. Teaching Assistantship Committee. Member, 2003.
5. University Undergraduate Admissions Committee. Member (Physics), 1997, 1998, 2003.
6. Faculty Misconduct Investigation Committee. Chair, 2003.
7. Student Disciplinary Committee. Member, 2003.
8. Physics Curriculum Committee. Chair, 2003-2003.
9. Keller Method Committee. Member, 2002.
10. Physics Department Vice-Head, 1998.
11. Juiz de Fora Physics Olympiads. Coordinator, 1997-1998.
12. Physics Week. Coordinator, 1998.
13. Search Committee (Lecturer). Member, 1998.
14. Masters Program UFJF/UFMG (joint). Coordinator and collegiate member, 1996-1997.
15. Physics Department Computer System and Infrastructure Committee. Member, 1995-1997.
16. Search Committee (Visiting Professors). Chair, 1995.

### **Peer- and Grant-Review**

1. *Activitas Nervosa Superior*
2. *The British Journal for the Philosophy of Science*
3. *Caderno Brasileiro de Ensino de Física*
4. *Chaos, Solitons and Fractals*
5. *Edukacja Filozoficzna*
6. *Entropy*
7. *Foundations of Physics*
8. *Foundations of Science*
9. *Frontiers in Psychology*
10. *Handbook on Reasoning-based Intelligent Systems*

11. Information
12. International Journal of Theoretical Physics
13. International Journal of Quantum Foundations
14. Internet Encyclopedia of Philosophy
15. Journal of Biological Physics
16. Journal of Consciousness Studies
17. Journal for General Philosophy of Science
18. Journal of Mathematical Psychology
19. Philosophical Transactions of the Royal Society A
20. Physica A
21. Physica Scripta
22. Physical Review ST Physics Education Research
23. Progress in Biophysics and Molecular Biology
24. Quantum Information Processing
25. Quantum Interactions
26. Research Foundation Flanders (FWO)
27. Synthese
28. Synthese Library

## **LANGUAGES**

English & Portuguese (fluent)  
French & Spanish (basic reading and comprehension)

## **AFFILIATIONS**

American Association of Physics Teachers (AAPT)  
Association for Mathematical Consciousness Science (AMCS)  
Brazilian Academy of Philosophy, Corresponding Member (ABP)  
Brazilian Physical Society (SBF)  
Center for Contextuality in Physics and the Social Sciences (Purdue University)  
Center for the Explanation of Consciousness (Stanford University)  
Institute for Quantum Social and Cognitive Science (IQSCS)  
The Philosophy of Science Association (PSA)