

Allegato alla domanda di partecipazione
Curriculum formativo, didattico, scientifico e professionale del candidato

Dichiarazione sostitutiva di certificazioni Dichiarazione sostitutiva dell'atto di notorietà

(Art. 46, D.P.R. 28 dicembre 2000 n. 445)

(da sottoscrivere davanti all'impiegato addetto o da presentare o spedire con la fotocopia di un documento di identità)
(Art. 47, D.P.R. 28 dicembre 2000 n. 445)

Estremi del bando di selezione	Bando n 161A_23 PUBBLICATO NEL SITO UFFICIALE D'ATENEIO IN DATA: 20.12.2023
Informazioni aggiornate al	Aprile 2024
Nome e Cognome	Federico Hernán Holik
Data di nascita	27/06/1980

Si raccomanda di indicare con precisione tutti gli elementi valutabili ai sensi del bando di selezione (aggiungere o togliere righe secondo necessità).

Esperienza professionale

Periodo	Ente	Principali attività e responsabilità
March 2006- March 2011.	Doctoral(PhD), CONICET (Consejo Nacional de Investigaciones Científicas y Tecnológicas) type I and type II, Buenos Aires, Argentina.	Research
April 2011 - April 2013.	Postdoctoral, CONICET (Consejo Nacional de Investigaciones Científicas y Tecnológicas), Buenos Aires, Argentina.	Research
June 2013 - November 2013	Postdoctoral, ERC (European Research Council) project, Philosophy of Canonical Quantum Gravity, Laboratoire Sphere, UMR 7219, CNRS, Université Paris Diderot.	Research
1/07/2014 - 1/12/2016	Assistant Member of Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET).	Research
01/2017	Adjoint Member of Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET).	Research

Istruzione, formazione (es. titoli di studio, certificazioni professionali/linguistiche/informatiche)

Data	Titolo / Principali tematiche	Ente
Marzo 2006	Licenciatura en Ciencias Físicas (equivalent to Master in Physics)	FCEN-UBA, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires.
Marzo 2016	Doctor de la Universidad de Buenos Aires, especializado en Ciencias Físicas (PhD in Physics).	FCEN-UBA, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires.

Research Articles

□ Segmentation of quantum generated sequences by using the Jensen–Shannon divergence

- Author links open overlay panel, *Physica A: Statistical Mechanics and its Applications* Volume 628, 15 October 2023, 129162. M. Losada, V. A. Penas, F. Holik, P. W. Lamberti.
- Ontological indistinguishability as a central tenet of quantum theory, *Philosophical Transactions of the Royal Society A* 381 (2255), 20220100. J.A. de Barros y F. Holik.
 - Multi-class classification based on quantum state discrimination, *Fuzzy Sets and Systems*, 2023, 108509, ISSN 0165-0114. R. Giuntini, A. C. Granda Arango, H. Freytes, F. H. Holik y G. Sergioli.
 - Quantum-inspired algorithm for direct multi-class classification, *Applied Soft Computing*, Volume 134, 2023, 109956. R. Giuntini, F. Holik, D. K. Park, H. Freytes, C. Blank y G. Sergioli.
 - Information quantifiers and unpredictability in the COVID-19 timeseries data, *Revista de matemática: teoría y aplicaciones* (2023) **30**(1) : 1-23. V. Vampa, A. M. Kowalski, M. Losada M. Portesi and F. Holik.
 - Entropy-Based Informational Study of the COVID-19 Series of Data. *Mathematics* 2022, **10**, 4590. A. M. Kowalski, M. Portesi, V. Vampa, M. Losada and F. Holik.
 - Parameterizing density operators with arbitrary symmetries to gain advantage in quantum state estimation, *Physica A: Statistical Mechanics and its Applications*, Volume 611, 2023, 128427. I. Corte, M. Losada, D. Tielas, F. Holik y L. Reb'on.
 - Lógica cuántica, Nmatrices y adecuación II, *Teorema*, (2023), Vol. XLI/3, 2022, pp. 65-88. Juan Pablo Jorge y Federico Holik.
 - Lógica cuántica, Nmatrices y adecuación I, *Teorema*, (2022), XLI/3, p. 65-88. Juan Pablo Jorge y Federico Holik.
 - An Algebraic Model for Quantum Unstable States, *Mathematics* 2022, 10(23), 4562. S. Fortin, M. Gadella, F. Holik, J. P. Jorge and M. Losada.
 - Performance of the quantum MaxEnt estimation in the presence of physical symmetries. *Quantum Information Processing* **21**, 227 (2022), D. Tielas, M. Losada, L. Reb'on and F. Holik.
 - MaxEnt principle and reduced density matrix estimation, *Physica A: Statistical Mechanics and its Applications*, Volume **600**, (2022), 127517, M. Losada, V. A. Penas, F. Holik, P. W. Lamberti.
 - Partial orbits of quantum gates and full three-particle entanglement, *Quantum Information Processing*. 2021, **20**, 351, F. Holik, M. Losada, H. Freytes, A. Plastino and G. Sergioli.
 - Generalized Probabilities in Statistical Theories, *Quantum Rep.* 2021, **3**(3), 389-416, F. Holik, C. Massri, A. Plastino and M. Sáenz.
 - On the representation of measures over bounded lattices. *Algebra Universalis* **82**, 56 (2021), C. Massri and F. Holik.
 - On the Connection Between Quantum Probability and Geometry, *Quanta* **10** (1), 1-14, (2021), F. Holik.
 - Gamow vectors formalism applied to the Loschmidt echo, *The European Physical Journal Plus* **135** (9), 1-18, (2020), S. Fortin, M. Gadella, F. Holik and M. Losada.
 - Indistinguishability and Negative Probabilities, *Entropy*, **22**(8), 829, (2020), J. A. de Barros and F. Holik.
 - Extremal elements of a sublattice of the majorization lattice and approximate majorization, *Journal of Physics A: Mathematical and Theoretical*, Volume **53**, Number **21**, (2020), C. Massri, G. Bellomo, F. Holik and G. M. Bosyk.
 - Non-deterministic Semantics for Quantum States, *Entropy*, **22**(2), 156, (2020), , J. P. Jorge and F. Holik.

- Evolution of quantum observables: from non-commutativity to commutativity, *Soft Computing*, volume **24**, pages 10265-10276 (2020), S. Fortin, M. Gadella, F. Holik and M. Losada.
- Solutions for the MaxEnt problem with symmetry constraints, *Quantum Information Processing*, **18**:293, (2019), M. Losada, F. Holik (CA), C. Massri and A. Plastino

- Indistinguishability and the origins of contextuality in physics, *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **377**: 20190150 (2019), J. A. de Barros, F. Holik and D. Krause.
- Optimal common resource in majorization-based resource theories, *New Journal of Physics*, Volume **21**, (2019), G. M. Bosyk, G. Bellomo, F. Holik, H. Freytes and G. Sergioli.
- Hermite-Gaussian model for quantum states, *Physica A: Statistical Mechanics and its Applications*, Volume **532**, 121806 (2019), M. Losada, I. S. Gomez and F. Holik.
- Logical structures underlying quantum computing, *Entropy*, **21** (1), 77, (2019), F. Holik, G. Sergioli, H. Freytes and A. Plastino.
- On an explicit representation of the Lukasiewicz sum as a quantum operation, *Soft Computing*, Volume **23**, Issue **12**, pp 3999-4007, (2019), H. Freytes, F. Holik, G. M. Bosyk and G. Sergioli.
- States in generalized probabilistic models: an approach based in algebraic geometry, *Mathematica Slovaca*, **69** (1), 53-70, (2019), C. Massri, F. Holik, A. Plastino.
- Dynamics of algebras in quantum unstable systems, *International Journal of Modern Physics A*, Vol. **33**, No. **18** n **19**, 1850109 (2018), M. Losada, S. Fortin, M. Gadella and F. Holik.
- Generalized entropies in quantum and classical statistical theories, *Eur. Phys. J. Special Topics*, **227**, 335-344 (2018), M. Portesi, F. Holik, P.W. Lamberti, G.M. Bosyk, G. Bellomo and S. Zozor.
- Pattern Recognition in Non-Kolmogorovian Structures, *Foundations of Science*, Volume **23**, Issue **1**, pp 119-132, (2018), F. Holik, G. Sergioli, H. Freytes and A. Plastino.
- Lossless quantum data compression with exponential penalization: an operational interpretation of the quantum Rényi entropy, *Scientific Reports*, **7**: 14765, (2017), Bellomo, G. Bosyk, F. Holik and S. Zozor.
- Classical limit and quantum logic, *International Journal of Theoretical Physics*, Volume **57**, Issue **2**, pp 465-475 (2018), M. Losada, S. Fortin and F. Holik.
- Contextuality and Indistinguishability, *Entropy*, (2017), **19** (9), 435, J. A. de Barros, F. Holik and D. Krause.
- Toffoli gate and quantum correlations: a geometrical approach, *Quantum Information Processing*, **16**: 55, (2017), F. Holik, G. Sergioli, H. Freytes, R. Giuntini and A. Plastino.
- Approximate transformations of bipartite pure-state entanglement from the majorization lattice, *Physica A - Statistical and Theoretical Physics*, Volume **473**, p. 403-411, (2017), G. Bosyk, G. Sergioli, H. Freytes, F. Holik and G. Bellomo.
- Natural Information Measures In Cox Approach For Contextual Probabilistic Theories, *Quantum Information & Computation*, (2016) vol. **16**, p. 87-104, F. Holik, A. Plastino and M. Sáenz.
- What is quantum information?, *Studies in History and Philosophy of Science Part B: Studies in History and Philosophy of Modern Physics*, **56** (2016) 17-26, O. Lombardi, F. Holik and L. Vanni.
- What is Shannon Information? *Synthese*, (2016), **193**: 1983, O. Lombardi, F. Holik and L. Vanni.
- Comment on “Quantum Kaniadakis entropy under projective measurement”, *Physical Review E*, **94**, 026103 (2016), G. M. Bosyk, S. Zozor, F. Holik, M. Portesi, and P. W. Lamberti.

- A family of generalized quantum entropies: definition and properties, *Quantum Information Processing*, Volume **15**, Issue **8**, pp 3393-3420, (2016), G. M. Bosyk, S. Zozor, F. Holik, M. Portesi and P. W. Lamberti.
- Gometric probability theory and Jaynes' methodology, *International Journal of Geometric Methods In Modern Physics*, **13**, 1650025 (2016), F. Holik (CA), C. Massri and A. Plastino.

- Non-unitary evolution of quantum logics, *Non-Hermitian Hamiltonians in Quantum Physics* Volume **184** of the series *Springer Proceedings in Physics*, (2016), pp 219-234, S. Fortin, F. Holik and L. Vanni.
- Quantum Logical Structures for Similar Particles, *Cad. Hist. Fil. Ci.*, Campinas, Série **4**, v. **2**, n. **1**, p. 13-58, F. Holik, I.S. Gómez and D. Krause, (2016).
- Quantum information as a non-Kolmogorovian generalization of Shannon's theory, *Entropy*, **17** (11), 7349-7373, (2015), F. Holik (CA), G. Bosyk and G. Bellomo.
- A formal framework for the study of the notion of undefined particle number in quantum mechanics, *Synthese*, Volume **192**, Issue **2**, 505- 523, (2015), N. C. A. da Costa and F. Holik.
- Generalizing Entanglement via Informational Invariance for Arbitrary Statistical Theories, *SOP Transaction On Theoretical Physics*, Volume **1**, Number **2**, pp.138-153, (2014), F. Holik (CA), C. Massri and A. Plastino.
- Logic, Geometry And Probability Theory, *SOP Transaction On Theoretical Physics*, Volume **1**, Number **2**, pp.128-137, 2014, F. Holik.
- A discussion on the origin of quantum probabilities, *Annals of Physics*, Volume **340**, Issue **1**, 293-310, (2014), F. Holik (CA), A. Plastino and M. Sáenz.
- Un nuevo esquema conceptual para la interpretación de las mezclas impropias en mecánica cuántica, *Scientiae Studia*, Vol **11**, **1** (2013), F. Holik, C. de Ronde and W. Christiaens.
- On the connection between complementarity and uncertainty principles in the Mach-Zehnder interferometric setting, *Physica Scripta*, **87**, 065002, (2013), G. Bosyk, M. Portesi, F. Holik and A. Plastino.
- Quantal effects and MaxEnt, *Journal of Mathematical Physics*, **53** 073301 (2012), F. Holik and A. Plastino.
- On the lattice structure of probability spaces in quantum mechanics *International Journal Of Theoretical Physics*, (June 2013), Volume **52**, Issue **6**, pp 1836-1876, F. Holik (CA), C. Massri, A. Plastino and L. Zuberan.
- Convex polytopes and quantum separability, *Physical Review A*, **84**, 062327 (2011), F. Holik and A. Plastino. Article selected for the January 2012 issue of *Virtual Journal of Quantum Information* (published by the American Physical Society and the American Institute of Physics).
- Convex quantum logic *International Journal of Theoretical Physics*, **51**, 1600-1620 (2012), F. Holik (CA), C. Massri and N. Ciancaglini.
- A Quantum Logical and Geometrical Approach to the Study of Improper Mixtures *Journal of Mathematical Physics* **51** (2010) 052108, G. Domenech, F. Holik and C. Massri. Article selected for the June 2010 issue of *Virtual Journal of Quantum Information* (published by the American Physical Society and the American Institute of Physics).
- Some Remarks on the Notion of Separability Within the Creation Discovery View *International Journal of Theoretical Physics* **49** (2010), W. Christiaens, C. de Ronde, B. D'Hooghe and F. Holik.
- No labeling quantum mechanics of indiscernible particles *International Journal of Theoretical Physics*, (2010), Volume **49**, Issue **12**, pp 3085- 3091, G. Domenech, F. Holik, L. Kniznik and D. Krause.
- Q-spaces and the foundations of quantum mechanics *Foundations of Physics* **38** (2008) 969994, G. Domenech, F. Holik and D. Krause.
- A discussion on particle number and quantum indistinguishability, *Foundations of Physics* **37** (2007) 855-878, G. Domenech and F. Holik.

Book Chapters

- Holik, F., Jorge, J.P. (2023). Open Problems in the Development of a Quantum Mereology. In: Arenhart, J.R.B., Arroyo, R.W. (eds) *NonReflexive Logics, Non-Individuals, and the*

Philosophy of Quantum Mechanics. Synthese Library, vol 476. Springer, Cham.

- J.A. de Barros, F. Holik and D. Krause, (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.
- F. Holik and G. Bosyk, “Classical Models Of Quantum Information”, in *What is Quantum Information?*, Edited by O. Lombardi, S. Fortin, F. Holik and C. Lopez, (2017), p. 207-231, Cambridge University Press.
- F. Holik and A. Plastino, “Quantum Mechanics: a new turn in probability theory and information processing”, in *Contemporary Research in Quantum Systems*, ISBN: 978-163117-132-1, NOVA Publishers, pp. 339-414, (2014).
- F. Holik, “Neither name, nor number”, in *Probing the Meaning of Quantum Mechanics: Physical, Philosophical and Logical Perspectives*, C. de Ronde, S. Aerts, D. Aerts (Eds.), ISBN: 978-981-4596-29-9, World Scientific, Singapore, pp. 251-262, (2014).
- Modalidad y no-individualidad en la teor´ıa cu´antica con G. Domenech y C. de Ronde, *Epistemolog´ıa e Historia de la Ciencia*, **14**, (2008).
- Una discusi3n orientada a ampliar la teor´ıa de cuasiconjuntos, *Filosofia e Hist3ria da Ciencia no Cone Sul, Selecao de Trabalhos do 5 Encontro*, (2008), 143-147, Roberto de Andrade Martins, Cibelle Cellestino Silva, Jukiana Mesquita Hidalgo Ferreira y Lilian AlChueyr Pereira Martins eds, AFHIC.
- ¿Acerca de qu3 habla la mec´anica cu´antica?, *Epistemolog´ıa e Historia de la Ciencia*, **13**, (2007), 245-250, L. Salvatico y P. Garc´ıa eds., UNC.
- Sobre el problema del cardinal en colecciones de indistinguibles y su relaci3n con el mundo de los cuantos, *Epistemolog´ıa e Historia de la Ciencia*, **12**, (2006), UNC.

Proceedings

- Sur le codage quantique sans perte avec p3nalisation exponentielle, XXVIeme colloque GRETSI (GRETSI 2017), (Sep 2017), Juan-LesPins, France., S. Zozor, G. M. Bosyk, G. Bellomo and F. Holik.
- On the Interpretation of Probabilities in Generalized Probabilistic Models, F. Holik, S. Fortin, G. Bosyk and A. L. Plastino. Edited by de Barros J., Coecke B., Pothos E., *Quantum Interaction-QI 2016, Lecture Notes in Computer Science*, vol 10106, Springer.
- Un an´alisis del concepto de individualidad en las interpretaciones modales con G. Domenech y C. de Ronde, Abstracts de la XIV Reuni3n Nacional de Filosofıa, Tucum´an, 2007.
- “Un dise˜no simple orientado a objetos de un equipo de f3tbol de robots”, Mart´ınez, A., Park D., Burella J., Viscuso G., Holik F. y Fort´ın S., publicado en actas del III Workshop en Inteligencia Artificial aplicada a Rob3tica M3vil, organizado por la Universidad Abierta Interamericana, (2006).
- La teor´ıa de cuasiconjutos en la mec´anica cu´antica, *Anales AFA*, (2005), 32-33.

Books

- *Quantum Foundations: 90 Years of Uncertainty*, Edited by P. W. Lamberti, G. M. Bosyk, S. Fortin and F. Holik. Pages: 188. Published: (2019). This book is a printed edition of the *Special Issue Quantum Foundations: 90 Years of Uncertainty*, that was published in *Entropy*. ISBN 978-3-03897-754-4; ISBN 978-3-03897-755-1. <https://doi.org/10.3390/books978-3-03897-755-1>
 - *Quantum Worlds: Perspectives on the Ontology of Quantum Mechanics*, edited by O. Lombardi, S. Fortin, C. L'opez and F. Holik, Cambridge University Press, Online ISBN: 9781108562218, (2019). <https://doi.org/10.1017/9781108562218>
 - *What is Quantum Information?*, Edited by O. Lombardi, S. Fortin, F. Holik and C. Lopez, Cambridge University Press, ISBN: 9781107142114, (2017). <https://doi.org/10.1017/9781316494233>
- Federico Holik, *Teoría de cuasiconjuntos y mecánica cuántica*, Editorial Académica Española, ISBN: 978-3-659-00662-3, (2014).
- Federico Holik, *Compound Quantum Systems*, Scholar's Press, ISBN: 978-3-639-66177-4, (2014).

Altre attività scientifiche

Edited Items

- Guest Editor of the Special Issue “Foundations of Quantum Computing”. Journal: *Axioms*. 2018-2020.
- Lead Guest Editor of the Special Issue “Quantum Structures & Quantum Information Theory”. Journal: *Soft Computing*, 2018-2020.
- Guest Editor of the Special Issue “Foundations of Quantum Mechanics: Quantum Logic and Quantum Structures”. Journal: *Entropy*. Starting: 2018-2020.
- Guest Editor of the Special Issue “Quantum Chaos and Complexity”. Journal: *Entropy*. Starting: 2018-2019. Guest Editor of the Special Issue “Quantum Foundations: 90 Years of Uncertainty”. Journal: *Entropy*, 2017-2018.
- Guest Editor of the Special Issue “Foundations of Quantum Mechanics”. Journal: *Entropy*, 2017.
- Editor of the Book *What is Quantum Information?*, (2017), Cambridge University Press. Edited by O. Lombardi and S. Fortin and F. Holik and C. Lopez. To be published in April 2017.
- Editor of the Book *Quantum Worlds Perspectives on the Ontology of Quantum Mechanics*, (2019), Cambridge University Press. Edited by O. Lombardi and S. Fortin and C. López and F. Holik.

Peer review activity

I have served as a reviewer for the following journals:

Quantum Information processing - Journal of Mathematical Physics - Scientific Reports - Journal of Physics A: Mathematical and Theoretical - Physical Review A - Physical Review E - Physical Review Research - Annalen der Physik - International Journal of Quantum Information - Physica A: Statistical and Theoretical - Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences - Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences - Foundations of Physics - New Journal of Physics - International Journal of Theoretical Physics - Entropy - Zeitschrift für Naturforschung A: A Journal of Physical Sciences - Anales de AFA - Physics Letters A - Modern Physics Letters A - Soft Computing - Studia Logica - Synthese - Theoria - Manuscripta - Foundations of Science - Logic Journal of the IGPL - Studia Logica - Journal of Mathematical Economics - IEEE Latin America Transactions - Physics Essays - Results in Physics - Quantum Economics and Finance - Journal of Artificial Intelligence Research

Ulteriori informazioni pertinenti

Luogo, data e firma

Buenos Aires, 17/04/2024