



# Ezequiel Alvarez

PhD Professor  
Theoretical Physics

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## About me

I am passionate about finding out how the Universe behaves Beyond the Standard Model. As most of HEP physicists, one of my major concerns is how the Dark Matter puzzle is solved. I enjoy doing research in phenomenology in High Energy Physics and trying to further understand how Nature behaves.

I am deeply involved in the development of the recently (2016) funded ICAS (International Center for Advanced Science), in Argentina. We are building the high quality research Institute we dreamt up.

If I had to summarize my work, my passion, my wishes, my past, my present and my future in one word, that would be: *Motivation*.

## Skills



## Interests

**Research:** Phenomenology of high energy physics and astro-ph. I look in detail LHC, astrophysical and other relevant experiments and try to understand how Nature behaves beyond our current understanding. I am passionate in finding out what is the theory that follows the Standard Model, and also what is Dark Matter. I am also very interested in recent progress in all other fields of Science and I do my best to keep track of relevant news about this.

**Technology & Innovation:** I have an intense and enthusiastic applied-science side in which I organize International Conferences and I pursue and coordinate the creation of the International Centre for Economic development through Science and Technology *InterEST*. In this Centre the Argentine scientific community would partner with foreign companies and Institutions in a Research + Development + Patenting (R+D+P) scheme to foster and power the link between the aforementioned actors.

**Science Policy:** I pursue to conduct science to best serve public interests. I am interested in enhancing knowledge and intelligence as an added value for improving the quality of life as a whole.

## Positions & Education (summary)

Since 2006	Research Permanent Position Independent Researcher	CONICET (Argentina)
Since 2016	Professor Physics	University of San Martin (Argentina)
Since 2016	Scientific Manager International Center for Advanced Studies	ICAS (Argentina)
Since 2017	Latin American Representative (unique) International Committee for Future Accelerators	ICFA (International)
2012	Postdoc Stanford University	SLAC (USA)
2011-2017	Regular Associate International Centre for Theoretical Physics	ICTP (Italy)
2001-2005	PhD in Theoretical Physics Thesis: <i>CP, T and CPT analyses in EPR-correlated <math>B^0 \bar{B}^0</math> decays</i>	Valencia University (Spain)
1997-2000	Master in Theoretical Physics Prize <i>First of the Class</i>	Institute Balseiro, Bariloche (Argentina)

## Scientific Work (summary)

2020	Creator of AI sites as AI-Friendly.com and IArxiv.org
2000-2020	37 international scientific publication in first class journals as JHEP, Physical Review, Nuclear Physics, Physics Letters, etc.
2001-2020	30 international conferences, schools, workshops, etc.
2016-2020	Organizer of 19 International Conferences at ICAS, UNSAM and one within the framework of a United Nations conference.
2008-2020	Full formation to PhD level of Drs. E. Coluccio Leskow and J.I. Sanchez Vietto. Currently advising 3 more PhD students. 5 Master Thesis advised.
2012	Creator and CEO of the web-security-algorithm Qlink.it.

## Languages

English	Excellent
Spanish	Native
Italian	Excellent
French	Very good

## Scientific articles

- 2020 E. Alvarez, M. Estévez and R. M. S. Seoane, “Z’-explorer: a simple tool to probe Z’ models against LHC data,”  
[arXiv:2005.05194 [hep-ph]]
- 2020 E. Alvarez, F. Lamagna and M. Szewc, “A Machine Learning alternative to placebo-controlled clinical trials upon new diseases: A primer”  
[arXiv:2003.12454 [q-bio.QM]]
- 2020 E. Alvarez, F. Lamagna, C. Miquel and M. Szewc, “Four-top as probe of light top-philic New Physics, Intelligent Arxiv: Sort daily papers by learning users topics preference,”  
[arXiv:2002.02460 [cs.LG]]
- 2020 E. Alvarez, F. Lamagna and M. Szewc, “Topic Model for four-top at the LHC,”  
JHEP 20 (2020), 049 doi:10.1007/JHEP01(2020)049  
[arXiv:1911.09699 [hep-ph]]
- 2019 E. Alvarez, A. Juste and R. M. S. Seoane, “Four-top as probe of light top-philic New Physics,”  
JHEP 12 (2019), 080 doi:10.1007/JHEP12(2019)080  
[arXiv:1910.09581 [hep-ph]]
- 2019 E. Alvarez and M. Szewc, “Non-resonant Leptoquark with multigeneration couplings to  $\mu\mu jj$  and  $\mu\nu jj$  at LHC,”  
arXiv:1811.05944 [hep-ph], Phys. Rev. D 99 (2019) no.9, 095004  
doi:10.1103/PhysRevD.99.095004
- 2018 E. Alvarez, L. Da Rold, A. Juste, M. Szewc and T. Vazquez Schroeder, “A composite pNGB leptoquark at the LHC,”  
arXiv:1808.02063 [hep-ph], JHEP 1812 (2018) 027
- 2018 E. Alvarez, L. Da Rold, M. Estevez and J. F. Kamenik, “Measuring  $|V_{td}|$  at the LHC,”  
Phys. Rev. D 97 (2018) no.3, 033002
- 2018 E. Alvarez, “Exercise: Dark Matter as fields that evolve backward in time,”  
arXiv:1803.08531 [gr-qc], presented in workshop *Voyages Beyond the SM II, 2018*, French Polynesia, Feb23 – Mar2, 2018
- 2017 E. Alvarez and M. Estevez, “ttbb as a probe of New Physics at the LHC”  
Phys.Rev. D96 (2017) no.3, 035016
- 2017 E. Alvarez, D. Faroughy, J. Kamenik, R. Morales, A. Szykman “Four tops for the LHC”  
Nucl.Phys. B915 (2017) 19-43
- 2017 E. Alvarez, L. Da Rold, J. Mazzitelli and A. Szykman, “Graviton resonance phenomenology and a pNGB Higgs at the LHC,”  
Phys.Rev. D95 (2017) no.11, 115012
- 2017 E. Alvarez, L. Da Rold, J. Mazzitelli and A. Szykman, “Graviton resonance phenomenology and a pseudo-Nambu-Goldstone boson Higgs at the LHC,”  
Phys. Rev. D 95 (2017) no.11, 115012
- 2017 E. Alvarez, L. Da Rold, J. Mazzitelli and A. Szykman, “A 750 GeV graviton and the Higgs as a pNGB,”  
arXiv:1606.05326 [hep-ph]
- 2016 E. Álvarez, A. Cuoco, N. Mirabal and G. Zaharijas, “Search for a correlation between UHECR events and high-energy gamma-ray Fermi-LAT data”  
JCAP 1612 (2016) 023

## Scientific articles

- 2016 J.F. Zanella, E. Álvarez, W. Dragani and A. Pescio, “An estimation of the effect of a possible wind speed increase on the ocean mixed layer depth at the northern Patagonian continental shelf”  
*Regional Studies in Marine Sciences*, 6, 7/2016, pp. 87–95.
- 2014 J. A. Aguilar-Saavedra, E. Álvarez, A. Juste and F. Rubbo, “Shedding light on the  $t\bar{t}$  asymmetry: the photon handle,”  
*JHEP* 1404 (2014) 188
- 2014 E. Álvarez, L. Da Rold and J. I. Sanchez Vietto, “Single production of an exotic bottom partner at LHC,”  
*JHEP* 1402 (2014) 010
- 2014 E. Alvarez, E. C. Leskow, J. Drobnak and J. F. Kamenik, “Leptonic Monotops at LHC,”  
*Phys. Rev. D* 89, 014016 (2014)
- 2013 E. Alvarez, J. I. S. Vietto and A. Szykman, “Top-antitop resonance searches beyond 1 TeV,”  
*Phys. Rev. D* 87, no. 5, 054015 (2013)
- 2012 E. Alvarez and E. C. Leskow, “A charged Z’ to conciliate the apparent disagreement between top-antitop Tevatron forward-backward asymmetry and LHC charge asymmetry,”  
*Phys. Rev. D* 86, 114034 (2012)
- 2012 E. Alvarez and Y. Bai, “Reach the Bottom Line of the Sbottom Search,”  
*JHEP* 1208, 003 (2012)
- 2012 E. Alvarez, “Improving top quark induced charge asymmetries at the LHC using  $t\bar{t}$  transverse momentum,”  
*Phys. Rev. D* 85 (2012) 094026
- 2011 E. Alvarez, L. Da Rold, J.I.S. Vietto, A. Szykman, “Phenomenology of a light gluon resonance in top-physics at Tevatron and LHC,”  
*JHEP* 1109 (2011) 007
- 2011 E. Alvarez, E. C. Leskow, J. Zurita, “Collider Bounds on Lee-Wick Higgs Bosons,”  
*Phys. Rev. D* 83 (2011) 115024
- 2011 E. Alvarez, L. Da Rold, A. Szykman, “A composite Higgs model analysis of forward-backward asymmetries in the production of tops at Tevatron and bottoms at LEP and SLC,”  
*JHEP* 1105 (2011) 070
- 2010 E. Alvarez, Francisco D. Mazzitelli, Alejandro G. Monastera and Diego A. Wisniacki “Casimir force between integrable and chaotic pistons”  
*Phys. Rev. A* 82 (2010) 052504
- 2009 E. Alvarez, L. Da Rold, C. Schat, A. Szykman, “Vertex Displacements for Acausal Particles: Testing the Lee-Wick Standard Model at the LHC,”  
*JHEP* 0910 (2009) 023
- 2009 E. Alvarez, L. Da Rold, C. Schat, A. Szykman, “Wrong vertex displacements due to Lee-Wick resonances at LHC,”  
*PoS EPS-HEP2009* (2009) 267
- 2009 E. Alvarez, F. D. Mazzitelli, “Long range Casimir force induced by transverse electromagnetic modes,”  
*Phys. Rev. D* 79 (2009) 045019
- 2008 E. Alvarez, L. Da Rold, C. Schat, A. Szykman, “Electroweak precision constraints on the Lee-Wick Standard Model,”  
*JHEP* 0804 (2008) 026

## Scientific articles

- 2008 E. Alvarez, A. Szykman, "Direct test of time reversal invariance violation in B mesons,"  
Mod. Phys. Lett. A23 (2008) 2085-2091
- 2008 E. Alvarez and Francisco D. Mazzitelli "Decoherence induced by Smith-Purcell radiation,"  
Phys. Rev. A77 (2008) 032113
- 2006 E. Alvarez, J. Bernabeu, M. Nebot, "The Demise of flavor tagging and its Delta-T dependence,"  
PoS HEP2005 (2006) 252
- 2006 E. Alvarez, J. Bernabeu, M. Nebot, "Delta t-dependent equal-sign dilepton asymmetry and CPTV effects in the symmetry of the  $B^0$ - anti- $B^0$  entangled state,"  
JHEP 0611 (2006) 087
- 2005 A. Satz, F. D. Mazzitelli, E. Alvarez, "Vacuum polarization around stars: Nonlocal approximation,"  
Phys. Rev. D71 (2005) 064001
- 2005 E. Alvarez, J. Bernabeu, N. E. Mavromatos, M. Nebot, J. Papavassiliou, "CPT violation in entangled  $B^0 - \bar{B}^0$  states and the demise of flavor tagging,"  
Phys. Lett. B607, 197-203 (2005)
- 2004 E. Alvarez, L. N. Epele, D. G. Dumm, A. Szykman, "Right handed currents and FSI phases in  $B^0 \rightarrow \phi K^{*0}$ ,"  
Phys. Rev. D70 (2004) 115014
- 2004 E. Alvarez, J. Bernabeu, "Correlated neutral B meson decays into CP eigenstates,"  
Phys. Lett. B579, 79-85 (2004)
- 2001 E. Alvarez, F. D. Mazzitelli, "Covariant perturbation theory and the Randall-Sundrum picture,"  
Phys. Lett. B505 (2001) 236-242