Curriculum Vitae – May 2018

Gonzalo Agustín Álvarez

Doctor in Physics

Personal Information

Nationality: Argentina
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Academic Data

- **Investigador Adjunto (Adjoint Researcher) of CONICET** (National Scientific and Technical Research Council - Argentina) **and Principal Investigator of the Nuclear Magnetic Resonance Spectroscopy and Imaging Laboratory** at Centro Atómico Bariloche, Comisión Nacional de Energía Atómica, Bariloche, Argentina (**June 2016/--**).
- **Jefe de Trabajos Prácticos (Equivalent to Assistant Professor) at Instituto Balseiro, Universidad Nacional de Cuyo**, Centro Atómico Bariloche, Comisión Nacional de Energía Atómica, Bariloche, Argentina (**August 2017/--**).
- **Visiting Scientist** at the Weizmann Institute of Science – Chemical Physics Department, Rehovot Israel (**May 2015/December 2015**).
  Host: Prof. Lucio Frydman.
- **Marie Curie Senior Fellow of the European Commission and Visiting Scientist** at the Weizmann Institute of Science – Chemical Physics Department, Rehovot Israel (**May 2013/May 2015**).
  Host: Prof. Lucio Frydman.
- **Postdoctoral Fellow** at the Weizmann Institute of Science – Chemical Physics Department, Rehovot Israel (**June 2012/April 2013**).
  Host: Prof. Lucio Frydman.
- **Staff Scientist** at the Fakultät Physik, Experimentelle Physik III – Technische Universität Dortmund, Dortmund, Germany **(March 2011/May 2012).**
  Host: Prof. Dieter Suter.
- **Postdoctoral Fellow of the Alexander von Humboldt Foundation** at the Fakultät Physik, Experimentelle Physik III - Universität Dortmund, Dortmund, Germany **(November 2008/February 2011).**
  Host: Prof. Dieter Suter.
- **Postdoctoral Fellow of CONICET** at the Facultad de Matemática, Astronomía y Física (FaMAF), Universidad Nacional de Córdoba (UNC), Argentina **(April 2007/ February 2009).**
  Advisor: Prof. Horacio M. Pastawski.
- **Profesor Auxiliar de 1º** (**Concurso**) (**Auxiliary Professor**), FaMAF-UNC (**2003-2008**).
- **Ph.D. in Physics (April 2002/April 2007).** Facultad de Matemática, Astronomía y Física, Universidad Nacional de Córdoba, Argentina.
  Doctoral Fellow of CONICET (April 2002-April 2007)
  Thesis: "Decoherence of many-spin systems in NMR: From molecular characterization to an environmentally induced quantum dynamical phase transition".
  e-link: http://www.famaf.unc.edu.ar/~galvarez/Alvarez-thesis-2007.pdf
  arXiv:0705.2350v1
  Advisor: Prof. Dr. Patricia R. Levstein
  Co-Advisor: Prof. Dr. Horacio M. Pastawski.
- **Auxiliar de 2º** (**Concurso**) (**Teaching Assistant**), FaMAF-UNC (**1999-2002**).
- **Degree: Licenciado en Física** (Equivalent to a Master in Science in Physics), March 1996/March **2002**. Facultad de Matemática Astronomía y Física, Universidad Nacional de Córdoba, Argentina.
  Thesis: "Quantum Interferences in the Spin Dynamics Observed by Nuclear Magnetic Resonance."
  Advisors: Prof. Dr. Patricia R. Levstein
  Prof. Dr. Horacio M. Pastawski
  Overall Score: 9.11 (scale 1-10).

Honors and Awards

- **Marie Curie Intra-European Senior Fellowship for career Development (May 2013/May 2015).**
- **Postdoctoral Fellowship of the Feinberg School of the Weizmann Institute (June 2012-April 2013.)**
- **Honor mention by the committee of the Argentinean Physical Society for the Giambiagi Prize 2009** to the best theoretical PhD thesis presented in Argentina during the years 2007-2008.
  Link:http://www.fisica.org.ar/?page_id=637
- **Postdoctoral Fellowship of the Alexander von Humboldt Foundation (November 2008/March 2011).**
- **Postdoctoral Fellowship of CONICET (April 2007/November 2008).**
- **Doctoral Fellowship of CONICET** (**April 2002-April 2007**).

Professional Activities

- **Reviewer for Science, Nature, Nature Commun., Phys. Rev. Lett., Phys. Rev. X, Phys. Rev. B, Phys. Rev A., J. Chem. Phys, J. Magn. Reson, Phil. Trans. R. Soc. A, J. Phys. B, Phys. Chem. Chem. Phys., and AIP Advances.**
- **Member of the Argentinian Selection Committee for the International Summer Science Institute (ISSI) of the Weizmann Institute (Israel) (2017/..).**
- **Member of the Scientific Committee of the Argentinian Society of Friends of the Weizmann Institute (Israel) (2017/..).** Director: Florencia Arbiser, President: Hugo Sigman.
- **Member of the organizing committee of the Medical Physics Division of the Argentinian Physics Society (Sep. 2017/..)**
- **Jury of the Masperi Award 2017, Asociación de Física Argentina** (Alejandro Butera, Gonzalo Álvarez y Hernán Rittaco).
- **Member of the Advisory committee for the incorporation of new researchers** for the Medical Physics Department, Gerencia de Física, CAB-CNEA (Drs. Gisela Bocan, Javier Fuhr, Xavier Bertou, Gonzalo Álvarez, Rodolfo Sánchez y Gonzalo Usaj) (May **2017**).
- **Member of the Scientific Committee of the IV Magnetic Resonance Workshop 2018 (2017/..)**
- **Member of the Coordination Committee of the Medical Physics Department, Centro Atómico Bariloche, CNEA, Argentina (2016/..).**
- **Principal Investigator of the Nuclear Magnetic Resonance Spectroscopy and Imaging Laboratory** at Centro Atómico Bariloche, Comisión Nacional de Energía Atómica, Bariloche, Argentina (**June 2016/--**).

Human Resources

- **Advisor of the Doctoral Thesis of Melisa Giménez, with Analia Zwick as Co-Advisor of a Doctoral Fellowship of CNEA**, Instituto Balseiro, Universidad de Cuyo, Bariloche Argentina **(2018-2023).**
- **Advisor of the Doctoral Thesis of Leonardo Pedraza, Co-advisor of Doctoral Fellowship of CNEA**, Instituto Balseiro, Universidad de Cuyo, Bariloche Argentina **(2018-2023).**
- **Advisor of the Postdoctoral fellowship of CONICET of Diana María Betancourth Giraldo**, Instituto Balseiro, Universidad de Cuyo, Bariloche Argentina **(2018-2020)**.
- **Advisor of the Postdoctoral fellowship of CONICET of Federico Daniel Domínguez**, Instituto Balseiro, Universidad de Cuyo, Bariloche Argentina **(2018-2020)**.
- **Advisor of the Doctoral fellowship of CONICET of María Cristina Rodríguez (Co-advisor D. Wisniacki)**, Instituto Balseiro, Universidad de Cuyo, Bariloche Argentina **(2018-2021)**.
- **Advisor of the Doctoral fellowship of CONICET of Juan Franco Schiavone**, Instituto Balseiro, Universidad de Cuyo, Bariloche Argentina **(2018-2021)**.
- **Advisor of the Master Thesis of Fabricio Lozano (Cotutor A. Zwick)**, Instituto Balseiro, Universidad de Cuyo, Bariloche, Argentina **(2017-2018)**.
- **Cotutor of the Master Thesis of Milena Capiglioni (Advisor A. Zwick)**, Instituto Balseiro, Universidad de Cuyo, Bariloche, Argentina **(2017-2018)**.
- **Advisor of the Bachelor Thesis of Agustín Dall'alba (Co-tutor A. Zwick)**, Instituto Balseiro, Universidad de Cuyo, Bariloche, Argentina **(2017)**.
- **Advisor of the Bachelor Thesis of Fabricio Lozano (Co-tutor A. Zwick)**, Instituto Balseiro, Universidad de Cuyo, Bariloche, Argentina **(2017)**.
- **Cotutor of the Bachelor Thesis of Milena Capiglioni (Advisor A. Zwick)**, Instituto Balseiro, Universidad de Cuyo, Bariloche, Argentina **(2017)**.
- **Advisor of Alejandra P. Palacios (co-advisor Julien Wist) on the research project** "Simulación de dinámicas de muchos espines con interacciones típicas en resonancia magnética nuclear", Facultad de ciencias naturales y exactas, Universidad del Valle, Santiago de Cali, Colombia **(2015)**.
- **Tutor in PhD Thesis of Mustafa Ahmed Ali** (Advisor D. Suter), TU Dortmund, Germany **(2011-2012).**
- **Tutor in the Bachelor Thesis of Hendrik Wittkamp** (Advisor D. Suter), TU Dortmund, Germany **(2010).**
- **Tutor in the Master Thesis of Ashok Ajoy** (Advisor D. Suter), TU Dortmund, Germany **(2010).**

Teaching Experience

- **Invited Professor (ad honorem) in "Caracterización de materiales, Espectroscopía"** (Instituto Balseiro, Bariloche), Two lectures on "Espectroscopia por Resonancia Magnética Nuclear (RMN)". Profs: A. Fainstein,A. Zwick,G.A. Álvarez, May **2018**.
- **Jefe de Trabajos Prácticos (Assistant Professor) at Instituto Balseiro,** Bariloche (**August 2017/--**).
- **Invited Professor (ad honorem) in "Caracterización de materiales, Espectroscopía"** (Instituto Balseiro, Bariloche), Two lectures on "Espectroscopia por Resonancia Magnética Nuclear (RMN)". Profs: A. Fainstein,A. Zwick,G.A. Álvarez, May **2017**.
- **Invited Professor (ad honorem) in Experimental IV** (Instituto Balseiro, Bariloche), "Análisis colorimétrico de la evolución de equimosis (moretones)". Profs: R.G. Pregliasco,G.A. Álvarez, Student: Caterina Lampertti. Feb-May **2017**.
- **Invited Professor** at the Escuela Jose Antonio Balseiro, "Nuevas tendencias de Investigación en Física Médica", Instituto Balseiro, Bariloche, Argentina, October 3-28, **2016**.
- **Profesor Auxiliar de 1º** (**Concurso**) (**Auxiliary Professor**), FaMAF-UNC (**2003-2008**).
- **Auxiliar de 2º** (**Concurso**) (**Teaching Assistant**), FaMAF-UNC (**1999-2002**).

Additional Activities:

- **Substitute Evaluator of the Doctoral thesis of Federico Daniel Dominguez** (Advisor Dr. Cecilia E. González), FaMAF, UNC, Córdoba, Argentina (**2018**).
- **Evaluator of the Doctoral thesis of Laura T. Knoll** (Advisor Dr. Miguel A. Larotonda), Universidad de Buenos Aires, Argentina (**2018**).
- **Evaluator of the Master thesis of Alan Ricardo ZAMBRANO HENRÍQUEZ** (Advisor Dr. Adrián Budini), Instituto Balseiro, Bariloche (**2018**).
- **Evaluator of the Master thesis in Medical Physics of Jhon Jairo Ramírez España** (Advisor MSc Daniel Fino), Instituto Balseiro, Bariloche (**2017**).

- **Evaluator of the Master thesis in Medical Physics of Aldana M. Lizarraga** (Advisor MSc Daniel Fino), Instituto Balseiro, Bariloche (**2017**).
- **Evaluator of "Charla de avance" of the Master in Physical Sciences of Alan Ricardo ZAMBRANO HENRÍQUEZ** (Advisor Dr. Adrián Budini), Instituto Balseiro, Bariloche (**2017**).
- **Evaluator of the Bachelor thesis of Timo Paschen** (Advisor: Prof. D. Suter), Technische Universtaet Dortmund (**2010**). "Untersuchung der Nichtlinearitaeten eines optischen Retroreflexaufbaus zur Erzeugung von korrigierten arbitraeren optischen Pulsformen".
- **Evaluator of the Bachelor thesis of Hendrik Wittkamp** (Advisor: Prof. D. Suter), Technische Universtaet Dortmund (**2010**). "Optimierung von geformten Radiofrequenzpulsen".

Languages

- **Spanish** (native language); **English** (advanced); **German** (intermediate); **French** (basic).

Grants

- Participation in the grant for the Medical Physics Department at CAB-CNEA. **2016-**
- CNEA grant for acquisition of a nuclear magnetic resonance spectrometer. **2015**
- Participation in a F.I.R.S.T (Bikura program) grant of the Academy of Sciences - Israel Science Foundation; PI: Lucio Frydman and Gershon Kurizki. **2013-2016.**
- I obtained a **Marie Curie Intra-European Grant for career development** for senior researchers grant no. PIEF-GA-2012-328605. (FP7-PEOPLE-2012-IEF). **2013-2015.**
- My position at TU Dortmund was supported by a DFG (German Research Foundation) grant. **2011-2012**
- Participation in a bilateral grant between Argentina and France (ECOS-SUD). **2003-2005.**
- Participation in a bilateral grant between Argentina and Israel (Antorcha foundation-Weizmann institute). **2004-2006.**
- Participation in more than 5 grants of different Argentinean governmental agencies including CONICET (National Research Council) and SECYT (National Secretary of Science and Technology). **Until 2009.**

Publications

Summary: 3 reviews and 36 original articles on international peer-reviewed journals (first author of 18), a book chapter and the PhD thesis in the arXiv and in the FaMAF home-page.

1 on Science, 1 on Rev. Mod. Phys., 1 Nat. Commun., 1 on Proc. Natl. Acad. Sci. USA, **7 on Phys. Rev. Lett.** (5 as a first author), **1 on Sci. Rep.**, **1 on Phys. Rev. Applied**, **1 on New J. Phys.**, **2 as Rapid Commun. in Phys. Rev. A**, 11 on Phys. Rev. A, 1 on PLoS ONE, 3 on J. Chem. Phys., 1 on Chem. Phys. Lett., **1 invited review in Phil. Trans. R. Soc. A**, 1 invited article in Ann. Phys., 1 on J. Magn. Reson., 1 on Solid State. Commun., 1 on Physica B, 1 on Quant. Inf. Comm. and 1 review on Technologies.

The publications 41, 35, 28, 24, 17 and 13 were **featured in the press** (see the respective references for details).

41. Internal gradient distributions: A susceptibility-derived tensor delivering morphologies by magnetic resonance. G.A. Álvarez, N. Shemesh, and L. Frydman. Scientific Reports **7**, 3311 (2017). Featured in Noticias del Instituto Balseiro, and árticulo de divulgación.

40. Quantum sensing of noisy and complex systems under dynamical control. G. Kurizki, G.A. Álvarez, and A. Zwick. Technologies **5**, 1 (2017).

39. Criticality of environmental information obtainable by dynamically controlled quantum probes. A. Zwick, G.A. Álvarez, and G. Kurizki. Phys. Rev. A **94**, 042122 (2016).

38. Protecting quantum information against environmental noise. D. Suter and G.A. Alvarez. Rev. Mod. Phys. **88**, 041001 (2016).

37. Maximizing information on the environment by dynamically controlled qubit probes. A. Zwick, G.A. Álvarez, and G. Kurizki. Phys. Rev. Applied **5**, 014007 (2016).

36. Local and bulk 13C hyperpolarization in nitrogen-vacancy-centred diamonds at variable fields and orientations. G.A. Álvarez, C.O. Bretschneider, R. Fischer, P. London, H. Kanda, S. Onoda, J. Isoya, D. Gershoni, and L. Frydman. Nat. Commun. **6**, 8456 (2015).

35. Localization-delocalization transition in the dynamics of dipolar-coupled nuclear spins, G.A. Álvarez, D. Suter, and R. Kaiser. Science **349**, 846 (2015). Featured in Infobrief der TU Dortmund (August 2015), datacenter-insider.de, pro-physik.de, Informationsdienst Wissenschaft online magazine, Innovation Report magazine, and Science Magazine.

34. Size distribution imaging by Non-Uniform Oscillating-Gradient Spin Echo (NOGSE) MRI, N. Shemesh, G.A. Álvarez, and L. Frydman, PLoS ONE **10**, e0133201 (2015).

33. Quantum state transfer in disordered spin chains: How much engineering is reasonable?, A. Zwick, G.A. Álvarez, J. Stolze, and O. Osenda, Quant. Inf. Comm. **15**, 582 (2015). arXiv:1306.1695.

32. Diffusion-assisted Selective Dynamical Recoupling: A new approach to measure background gradients in magnetic resonance, G.A. Álvarez, N. Shemesh, and L. Frydman, J. Chem. Phys. **140**, 084205 (2014).

31. Optimized dynamical control of state transfer through noisy spin chains, A. Zwick, G.A. Álvarez, G. Bensky, and G. Kurizki, New J. Phys. **16**, 065021 (2014).

30. Robustness of spin-chain state-transfer schemes, J. Stolze, G.A. Álvarez, O. Osenda, and A. Zwick in Quantum State Transfer and Network Engineering, edited by G. M. Nikolopoulos and I. Jex (Springer Berlin Heidelberg, 2014), pp. 149–182. Partly published in arXiv:1502.04879.

29. Measuring small compartment dimensions by probing diffusion dynamics via Non-uniform Oscillating-Gradient Spin-Echo (NOGSE) NMR, N. Shemesh, G.A. Álvarez, and L. Frydman, J. Magn. Reson. **237**, 49 (2013).

28. Coherent dynamical recoupling of diffusion-driven decoherence in magnetic resonance, G.A. Álvarez, N. Shemesh, and L. Frydman, Phys. Rev. Lett. **111**, 080404 (2013). Featured in the Interface magazine (winter 2014).

27. Quantum simulations of localization effects with dipolar interactions, G.A. Álvarez, R. Kaiser, and D. Suter, Ann. Phys. **525**, 833 (2013). Special Issue on "Quantum Simulations", featuring review papers written by Nobel Prize winners describing their foundational work (Wineland and Haroche). Issue edited by: Rainer Blatt, Immanuel Bloch, Ignacio Cirac, Peter Zoller.

26. Robustness of dynamical decoupling sequences, M.A.A. Ahmed, G.A. Álvarez, and D. Suter, Phys. Rev. A **87**, 042309 (2013).

25. Experimental protection of quantum gates against decoherence and control errors, A.M. Souza, G.A. Álvarez, and D. Suter, Phys. Rev. A (Rapid Commun.) **86**, 050301 (2012).

24. Iterative rotation scheme for robust dynamical decoupling, G.A. Álvarez, A.M. Souza, and D. Suter, Phys. Rev. A **85**, 052324 (2012). Featured in Phys. Rev. A Kaleidoscope (May 2012).

23. Shift-driven modulations of spin echo signals, P.E.S. Smith, G. Bensky, G.A. Álvarez, G. Kurizki, and L. Frydman, Proc. Natl. Acad. Sci. U. S. A. **109**, 5958 (2012).

22. Spin chains for robust state transfer: Modified boundary couplings versus completely engineered chains, A. Zwick, G.A. Álvarez, J. Stolze, and O. Osenda, Phys. Rev. A **85**, 012318 (2012).

21. Robust dynamical decoupling, A.M. Souza, G.A. Álvarez, and D. Suter, Phil. Trans. R. Soc. A **370**, 4748 (2012).

20. Effects of time-reversal symmetry in dynamical decoupling, A.M. Souza, G.A. Álvarez, and D. Suter, Phys. Rev. A **85**, 032306 (2012).

19. Controlling spin-spin network dynamics by repeated projective measurements, C.O. Bretschneider, G.A. Álvarez, G. Kurizki, and L. Frydman, Phys. Rev. Lett. **108**, 140403 (2012).

18. Measuring the spectrum of colored noise by dynamical decoupling, G.A. Álvarez, and D. Suter, Phys. Rev. Lett. **107**, 230501 (2011).

17. Robustness of spin-coupling distributions for perfect quantum state transfer, A. Zwick, G.A. Álvarez, J. Stolze, and O. Osenda, Phys. Rev. A **84**, 022311 (2011). Featured in Phys. Rev. A Kaleidoscope (August 2011).

16. Robust dynamical decoupling for quantum computing and quantum memory, A.M. Souza, G.A. Álvarez, and D. Suter, Phys. Rev. Lett. **106**, 240501 (2011).

15. Localization effects induced by decoherence in superpositions of many-spin quantum states, G.A. Álvarez and D. Suter, Phys. Rev. A **84**, 012320 (2011).

14. Optimal pulse spacing for dynamical decoupling in the presence of a purely-dephasing spin-bath, A. Ajoy, G.A. Álvarez, and D. Suter, Phys. Rev. A **83**, 032303 (2011).

13. Zeno and anti-Zeno polarization control of spin-ensembles by induced dephasing, G.A. Álvarez, D.D.B. Rao, L. Frydman, and G. Kurizki, Phys. Rev. Lett. **105**, 160401 (2010). Featured in the New Scientist Magazine (10 October 2010), in the Interface magazine (spring/summer 2011), in "Novedades e información de cyt - UNC" (15.02.2012), and in the Interface magazine (winter 2014).

12. Performance comparison of dynamical decoupling sequences for a qubit in a rapidly fluctuating spin bath, G.A. Álvarez, A. Ajoy, X. Peng, and D. Suter, Phys. Rev. A **82**, 042306 (2010).

11. Decoherence as attenuation of mesoscopic echoes in a spin-chain channel, G.A. Álvarez, E.P. Danieli, P.R. Levstein, and H.M. Pastawski, Phys. Rev. A **82**, 012310 (2010).

10. NMR quantum simulation of localization effects induced by decoherence, G.A. Álvarez and D. Suter, Phys. Rev. Lett. **104**, 230403 (2010).

9. Perfect state transfers based on selective quantum interferences within a complex spin network, G.A. Álvarez, M. Mishkovsky, E.P. Danieli, P.R. Levstein, H.M. Pastawski, and L. Frydman, Phys. Rev. A (Rapid Commun.) **81**, 060302 (2010).

8. Quantum parallelism as a tool for ensemble spin dynamics calculations, G.A. Álvarez, E.P. Danieli, P.R. Levstein, and H.M. Pastawski, Phys. Rev. Lett. **101**, 120503 (2008).

7. Decoherence of many-spin systems in NMR: From molecular characterization to an environmentally induced quantum dynamical phase transition G.A. Álvarez Ph.D thesis, Universidad Nacional de Córdoba, 2007. Director: Prof. Dr. P.R. Levstein, Co-Director: Prof. Dr. H.M. Pastawski Examining Committee: Prof. Dr. Carlos A. Balseiro, Prof. Dr. Guido A. Raggio, Prof. Dr. Juan Pablo Paz, and Prof. Dr. Pablo Serra

6. Decoherence under many-body system-environment interactions: a stroboscopic representation based on a fictitiously homogenized interaction rate, G.A. Álvarez, E.P. Danieli, P.R. Levstein, and H.M. Pastawski, Phys. Rev. A **75**, 062116 (2007).

5. Signatures of a quantum dynamical phase transition in a three-spin system in presence of a spin environment, G.A. Álvarez, P.R. Levstein, and H.M. Pastawski, Physica B **398**, 438 (2007).

4. Quantum dynamical phase transition in a system with many-body interactions E.P. Danieli, G.A. Álvarez, P.R. Levstein, and H.M. Pastawski, Solid State Commun. **141**, 422 (2007).

3. Environmentally induced Quantum Dynamical Phase Transition in the spin swapping operation, G.A. Álvarez, E.P. Danieli, P.R. Levstein, and H.M. Pastawski, J. Chem. Phys. **124**, 194507 (2006).

2. Quantum dynamics under coherent and incoherent effects of a spin bath in the Keldish formalism: application to a spin swapping operation, E.P. Danieli, H.M. Pastawski, and G.A. Álvarez, Chem. Phys. Lett. **402**, 88 (2005).

1. Many-spin quantum dynamics during cross polarization in 8CB, A.K. Chattah, G.A. Álvarez, P.R. Levstein, F.M. Cucchietti, H.M. Pastawski, J. Raya and J. Hirschinger, J. Chem. Phys. **119**, 7943 (2003).

Seminars and Talks

- **30 seminars in different Universities and Institutions** invited by J. Hirschinger (Université Louis Pasteur, Strasbourg, France **2003**), D. Suter (TU Dortmund, Germany **2007**, **2009, 2015**), B. Blümich and F. Casanova (RWTH, Aachen, Germany **2007**), L. Frydman (WIS, Rehovot, Israel **2008, 2011**), M. Lewenstein (ICFO, Barcelona, Spain **2008**), A. Nitzan (Tel Aviv University, Israel **2008**), C. Meriles (CUNY, New York, USA **2009, 2015**), J.P. Garrahan (University of Nottingham, United Kingdom **2011**), H.M. Pastawski (FaMAF, Córdoba, Argentina **2011, 2013**). D. Lidar (USC, Los Angeles, USA **2011**), R. Kaiser (INLN, Valbonne, France **2012, 2013, 2014, 2016**), and A.M. de Souza (CBPF, Rio de Janeiro, Brazil **2013**), P. Cappellaro (MIT, Cambridge, USA, **2015**), M. Lukin (Harvard, Cambridge, USA, **2015**), J. Wrachtrup (Universität Stuttgart, Germany, **2015**), Sujin Suwanna (Mahidol University, Bangkok, Thailand, **2016**), J. Wist (Universidad de Cali, Colombia, **2016**), D. Wisniacki and J.P. Paz (Universidad de Buenos Aires, Argentina, **2017**), N. Haberkorn (CAB, CNEA, Bariloche, Argentina, **2017)**.
  See http://fisica.cab.cnea.gov.ar/galvarez/index.php/seminars

- **23 seminars as invited speaker or contributed talk** at conferences:

1. Contributed talk at Pan American Advanced Studied Institute (PASI) and Workshop on Physics of Information – PASI 2003, Búzios, Brasil (**2003**).
2. Contributed talk at quantum information school and workshop – Paraty 2007, Paraty, Brazil (**2007**).
3. Contributed talk at the Network Meeting of the Alexander von Humboldt Foundation, Bonn, Germany (**2009**).
4. Invited speaker at the international workshop on Quantum Physics with Non-Hermitian Operators, Dresden, Germany (**2011**).
5. Contributed talk at the "Second international conference on quantum error correction", University of Southern California, Los Angeles, USA (**2011**).
6. Invited speaker at the "quantum innovators workshop" at IQC, Waterloo, Canada (**2012**).
7. Invited speaker at the "IV Quantum Information Workshop – Paraty 2013", Paraty, Brazil (**2013**).
8. Contributed talk at "The 12th International Bologna Conference on Magnetic Resonance in Porous Media (MRPM12)", Victoria University of Wellington, Wellington, New Zealand (**2014**).
9. Invited speaker (teleconference) at the TREFEMAC XII, Bahía Blanca, Argentina (**2014**).
10. Contributed talk at the International Workshop "Echoes in Complex Systems", Max Planck Institute for the Physics of Complex Systems, Dresden, Germany (**2014**).
11. Invited talk at the Schulich Symposium "Modern Electron Spin Resonance - New Methodologies and new Applications", Technion, Haifa Israel (**2015**).
12. Contributed talk at the 56th Experimental Nuclear Magnetic Resonance Conference, Asilomar Conference Center, Pacific Grove, California, USA (**2015**).
13. Invited Speaker at the "Balseiro Colloquium", Instituto Balseiro, S. C. de Bariloche, Argentina, August **2016**.
14. Invited Speaker at the VII Ibero-American NMR meeting, Cartagena de Indias, Colombia, 3-6 October **2016**.
15. Invited Lecturer at the Escuela Jose Antonio Balseiro, "Nuevas tendencias de Investigación en Física Médica", Instituto Balseiro, Bariloche, Argentina, October 3-28, **2016**.
16. Invited Speaker at the Workshop of the Escuela Jose Antonio Balseiro, "Nuevas tendencias de Investigación en Física Médica", Instituto Balseiro, Bariloche, Argentina, October 3-28, **2016**.
17. Invited Speaker at Frontiers In Physical Sciences, Buenos Aires, Argentina, November 14-18, **2016**.
18. Invited to give an honor talk to Prof. Dieter Suter, Festkolloquium held in honor of Prof. Dieter Suter on the occasion of his 60th birthday, Dortmund, Germany, November 22nd, **2016**.
19. Contributed talk at the "Workshop on Driven Quantum Systems", S. C. de Bariloche, Argentina, Nov. 28-Dec. 2, **2016**.
20. Invited Speaker at "What is bright with light", S. C. de Bariloche, Argentina, Dec. 5-9, **2016**.
21. Contributed talk at "Reunión INN CAB-CAC", S. C. de Bariloche, Argentina, May 21, **2017**.
22. Plenary Speaker at "102 Reunión Nacional de la Asociación Física Argentina", La Plata, Argentina, Sep. **2017**.
23. Invited Speaker at "División Física Médica de la 102 Reunión Nacional de la Asociación Física Argentina", La Plata, Argentina, Sep. **2017**.

Scientific Visits and Research Stays

- **Stage at the Laboratoire de RMN de la Matière Condesée, Institut Le Bel de l´Université Louis Pasteur**, Strasbourg, France (Financial support from ECOS-SUD), (**2003** – 3 months). Host : J. Raya and Prof. J. Hirschinger.
- **Several stages at the Chemical Physics Department, Weizmann Institute of Science**, Rehovot, Israel (Financial support from Fundación Antorchas and the Weizmann Institute).
  Host: Prof. L. Frydman (**2005** – 1 month, **2008** – Feb-March, **2008** Sept-Oct).
  Hosts: Prof. L. Frydman and Prof. G. Kurizki (**2008** – 2 weeks, **2009** – 2 weeks, **2011** – 1 month).
- **Several visits at Fachbereich Physik, Technische Universität Dortmund**, Dortmund, Germany (**2007, 2014, 2015, 2016**). Host: Prof. D. Suter.
- **Visit at the department of Macromolecular Chemistry, RWTH Aachen, Sammelbau Chemie**, Aachen, Germany, **2007**. Host: Prof. B. Blümich and Dr. F. Casanova. Collaboration with Dr. E.P. Danieli.
- **Short visit at ICFO - Institut de Ciències Fotòniques**, Barcelona, Spain, **2008**. Host: Prof. M. Lewenstein.
- **Visits to the National University of Cordoba**, Cordoba, Argentina, **2011** – 2 weeks, **2016** – 2 weeks. Host: Profs. P.R. Levstein and H.M. Pastawski.
- **Visit to the University of Southern California**, Los Angeles, USA, December **2011**. Host: Prof. D. Lidar.
- **Several visits to the Institut non linéaire de Nice (INLN), Université Nice Sophia Antipolis**, Valbonne, France (**2012**, **2013, 2014, 2015)**. Host: Prof. R. Kaiser.
- **Short visit at Institut für komplexe Quantensysteme - Universität Ulm**, Ulm, Germany, **2015**. Host: Prof. T. Calarco and Prof. S. Montangero.
- **Short visits at the Mahidol University**, Bangkok, Thailand, **2016**. Host: Prof. Dr. Sujin Suwanna and Prof. Dr. Kittiwit Matan.

Conferences

About 70 posters were presented in conferences. See http://fisica.cab.cnea.gov.ar/galvarez/index.php/academic-data#Posters

I have participated in 37 international conferences, in 11 Argentinean National Meeting and in one Israeli national meeting. See http://fisica.cab.cnea.gov.ar/galvarez/index.php/academic-data#Conferences

Brief Description of my work

My research activity is directed towards exploiting hitherto unexplored foundations of quantum control methods for tailoring spin evolutions in order to develop novel technologies and applications in the areas of nuclear magnetic resonance spectroscopy (NMR) and imaging (MRI). The main topic of my publications is about the spin dynamics of open quantum systems interacting with environments focusing on the characterization of the system dynamics and how it is modified by the environment (decoherence and dissipation). At the practical level, using both NMR experiments and theoretical tools, I am exploiting that by monitoring the changes on the system due to the environmental effects, one can sense the environment for characterizing physical, chemical, biological and medical processes to lead to new applications and technologies in magnetic resonance. At the fundamental level, the understanding and control of quantum interference phenomena, and in particular the propagation of spin excitations can improve our comprehension and control of quantum systems, their decoherence and irreversible processes.

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