

# Santiago Alberto Pighin

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- Personal data

Date of Birth: March 22, 1980  
Place of Birth: Santa Fe, Argentina  
Address: Centro Atómico Bariloche  
(R8402AGP) S. C. de Bariloche, Argentina  
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- Research Field

Synthesis and characterization of magnesium-based compounds for hydrogen storage.  
Monte Carlo simulations applied to magnetic systems.

- Present Position

**Investigador Asistente CONICET** (Research Assistant) at Departamento Físicoquímica de Materiales - Centro Atómico Bariloche - Comisión Nacional de Energía Atómica (CAB-CNEA).

- Academic Qualifications

- **Postdoc** at Departamento Físicoquímica de Materiales  
Centro Atómico Bariloche - Comisión Nacional de Energía Atómica (CAB-CNEA), from Apr 2011 to Jul 2014.
- **Postdoc** at Dipartimento di Fisica  
Università degli Studi di Padova (UNIPD), Padova (Italy), from Sep 2010 to Mar 2011.
- **Ph.D. in Physics**  
Facultad de Matemática, Astronomía y Física -  
Universidad Nacional de Córdoba (FaMAF-UNC), Aug 2009.  
Thesis: Critical behaviour of ferromagnetic thin films  
Advisor: Prof. Dr. Sergio A. Cannas.
- **Licenciado en Física (Master of Science)**  
FaMAF-UNC, Mar 2004  
Thesis: Critical behaviour of the screened Coulomb potential for two particle systems  
Advisor: Prof. Dr. Pablo Serra.

- Scientific publications

- Reversible hydrogen storage in  $Mg(H_xF_{1-x})_2$  solid solutions. S. A. Pighin, G. Urretavizcaya, F. J. Castro, J. Alloys Compd., **708**, 108-114, (2017).
- Study of  $MgH_2 + NbF_5$  mixtures: Formation of  $MgH_{2-x}F_x$  solid solutions and interaction with hydrogen. S. A. Pighin, G. Urretavizcaya, F. J. Castro, Int. J. Hydrogen Energy, **40**, 4585-4596, (2015).

- Finite temperature phase diagram of ultrathin magnetic films without external fields. S. A. Pighin, O. V. Billoni, and S. A. Cannas, *Phys. Rev. E*, **86**, 51119, (2012).
- Hydrogen sorption kinetics of magnesium hydride enhanced by the addition of  $Zr_8Ni_{21}$  alloy. S.A. Pighin, G. Capurso, S. Lo Russo, and H. A. Peretti, *J. Alloys Compd.*, **530**, 111-115, (2012).
- T=0 phase diagram and nature of domains in ultrathin ferromagnetic films with perpendicular anisotropy. S.A. Pighin, O.V. Billoni, D.A. Stariolo, and S.A. Cannas, *J.Mag.Mag.Mat.*, **322**, 3889, (2010).
- Spin reorientation transition and phase diagram of ultrathin ferromagnetic films M. Carubelli, O.V. Billoni, S.A. Pighin, S.A. Cannas, D.A. Stariolo, and F.A. Tamarit, *Phys.Rev.B*, **77**, 134417, (2008).
- Phase diagram of an Ising model for ultrathin magnetic films: Comparing mean field and Monte Carlo predictions S.A. Pighin, and S.A.Cannas, *Phys.Rev.B*, **75**, 224433, (2007).

- Students supervised

- Bruno Coco. Hydrogen storage in  $MgH_2$ : effect of  $NbH$  and  $Mg(H_xF_{1-x})_2$  in absorption and desorption kinetic. Summer school at Instituto Balseiro. February 2016.
- Florencia Grinblad. Solubility of  $H$  in  $MgF_2$  and  $F$  in  $MgH_2$ . Research project for course Experimental IV at Instituto Balseiro. February to June 2012.

- Teaching Experience (Teacher Assistant)

- 2016 to present  
Centro Regional Universitario Bariloche - Universidad Nacional del Comahue (CRUB-UNCOMA)  
Calculus in complex variable  
Introduction to mathematics
- 2012-2013 Instituto Balseiro - Universidad Nacional de Cuyo (IB-UNCu)  
Calculus and Algebra  
Experimental Physics  
Thermodynamics and Physical Chemistry
- 2009 Instituto Universitario Aeronáutico  
Classical Electricity and Magnetism
- 2007 FaMAF-UNC  
Introduction to Thermodynamics  
Classical Electricity and Magnetism
- 2006 Instituto Universitario Aeronáutico  
Calculus
- 2005 FaMAF-UNC  
Newtonian Mechanics
- 2003 FaMAF-UNC  
Calculus  
Thermodynamics and Statistical Mechanics

- 2002 FaMAF-UNC  
Introduction to Thermodynamics  
Classical Electricity and Magnetism

- Languages

- Spanish (mother tongue)
- English (Toefl iBT 98/120, 2010)
- French (DELFB2 80.5/100, 2015)

- Fellowships

- **Postdoctoral** Fellowship CONICET (National Research Council) at CAB-CNEA from 1st Apr of 2011 to 31rd Jul of 2014..
- **Postdoctoral** Fellowship ERASMUS-MUNDUS (BAPE Project), at *Università degli Studi di Padova* Italy, from 1st September of 2010 to 17th March of 2011.
- **Doctoral** Fellowship CONICET at *FaMAF - Universidad Nacional de Córdoba* Argentina, from April 2004 to March 2009.
- Fellowship for the participation in the IB-UnCu School of Out of Equilibrium Phenomena in Complex Systems - Instituto Balseiro. S. C. de Bariloche, Argentina, Sep-Oct 2004.

- Communications

- **Substitution of  $H^-$  and  $F^-$  in  $Mg - H - F$  solid solutions.** (S. A. Pighin, S. Ramos, G. Urretavizcaya, F. Castro). 16 Congreso Internacional de metalurgia y materiales SAM-CONAMET. Córdoba, Argentina. November 2016
- **Formation of  $MgH_{1.62}F_{0.38}$  solid solution by ball milling a  $MgH_2 - NbF_5$  mixture.** (S. A. Pighin, G. Urretavizcaya, F. Castro). HySEA 2014-International conference on Hydrogen Storage, Embrittlement and applications. Río de Janeiro, Brasil. Octubre 2014.
- **Estudio de soluciones sólidas del tipo  $MgH_xF_{2-x}$ : propiedades estructurales y de interacción con  $H_2$**  (S. A. Pighin, F. Grinblat, G. Urretavizcaya, F. Castro, J. Andrade-Gamboa). SAM-CONAMET 2014-IBEROMAT XIII. Santa Fe, Argentina. Octubre 2014
- **Caracterización de mezclas  $MgH_2 - NbF_5$  como material para almacenamiento de hidrógeno** (S. A. Pighin, G. Urretavizcaya, F. Castro). 13er Congreso Internacional en Ciencia y Tecnología de Metalurgia y Materiales. Puerto Iguazú, Argentina. Agosto 2013
- **Synthesis and characterization of hydrogen ab/desorption in mixtures  $MgH_2 - NbF_5$**  (S. A. Pighin, F. Castro). 97 Reunión Nacional de la Asociación Física Argentina. V. Carlos Paz, Argentina. Sep 25th-28th, 2012.
- **Solubility study of F in  $MgH_2$  and H in  $MgF_2$**  (F. Grinblat, S. A. Pighin, F. Castro). 97 Reunión Nacional de la Asociación Física Argentina. V. Carlos Paz, Argentina. Sep 25th-28th, 2012.

- **Hydrogen sorption kinetics of magnesium hydride enhanced by the addition of  $Zr_8Ni_{21}$  alloy** (S. A. Pighin, G. Capurso, S. Lo Russo, H. A. Peretti). 4th World Hydrogen Technologies Convention (WHTC2011). Glasgow, Scotland. Sep 14th-16th, 2011.
- **Action of  $Zr_8Ni_{21}$  in the absorption and desorption kinetics of magnesium hydride** (S. A. Pighin, G. Capurso, S. Lo Russo, H. A. Peretti). Hyfusen 2011. Mar del Plata, Argentina. Jun 6th-9th, 2011.
- **Spin reorientation transition and phase diagram of ultrathin magnetic films** (M. Carubelli, O.V. Billoni, S.A. Pighin, D. Stariolo, S.A. Cannas, and F.A. Tamarit). Sólidos 2009. Valparaíso, Chile. Nov 11th-13th, 2009.
- **Equilibrium and out of equilibrium properties of ferromagnetic ultrathin films** (S.A. Pighin, O.V. Billoni, D. Stariolo, and S.A. Cannas). 93 Reunión Nacional de la Asociación Física Argentina. Buenos Aires, Argentina. Sep 15th-19th, 2008.
- **Reorientation transition in magnetic ultrathin films** (M. Carubelli, O.V. Billoni, S.A. Pighin, D. Stariolo, S.A. Cannas, and F.A. Tamarit). 93 Reunión Nacional de la Asociación Física Argentina. Buenos Aires, Argentina. Sep 15th-19th, 2008.
- **Ising Model for ultrathin films, mean-field vs. Monte Carlo** (S.A. Pighin, S.A. Cannas). Second Latin-American School and Conference on: 'Statistical Physics and Interdisciplinary Applications' (LASSPIA07). Bento Gonçalves, Rio Grande do Sul, Brazil. Feb 5th-15th, 2007.
- **Phase diagram of a 2D Heisenberg model with dipolar interactions** (M. Carubelli, O.V. Billoni, S.A. Pighin, D. Stariolo, S.A. Cannas and F.A. Tamarit). Sólidos 2007. Huerta Grande, Córdoba, Argentina. Nov 6th-9th, 2007
- **Phase diagram of an Ising model with long-range interactions.** (S.A. Pighin, P. Gleiser, and S.A. Cannas). 91a. Reunión Nacional de la Asociación Física Argentina. Merlo, San Luis, Argentina. Sep 25th-29th, 2006.
- **Phase diagram of an Ising model with short and long-range competitive interactions.** (S.A. Pighin, P. Gleiser, and S.A. Cannas). IV Taller Regional de Física Estadística y Aplicaciones a la Materia Condensada. Bahía Blanca, Buenos Aires, Argentina. May 29th-31st, 2006.
- **Monte Carlo Simulations in a Classical Heisenberg Model with Dipolar Interactions** (S. Pighin, M. Carubelli, O. Billoni, F. Tamarit, and S. Cannas). IXth Latin American Workshop on Nonlinear Phenomena (LAWNP2005). S.C. de Bariloche, Río Negro, Argentina. Oct 23rd-28th, 2005.
- **Monte Carlo simulations in a classical Heisenberg model with dipolar interactions.** (S. Pighin, M. Carubelli, O. Billoni, F. Tamarit, and S. Cannas). 90a. Reunión Nacional de la Asociación Física Argentina. La Plata, Buenos Aires, Argentina. Sep 26th-29th, 2005.
- **Mean field analysis of a 2D Ising model with dipolar interactions.** (S.A. Pighin, P. Gleiser, and S.A. Cannas). III Taller Regional de Física Estadística y Aplicaciones a la Materia Condensada. La Plata, Buenos Aires, Argentina. Jun 22nd-24th, 2005.
- **Critical behaviour of the screened Coulomb potential for two particle systems.** (S.A. Pighin, and P. Serra). 89a. Reunión Nacional de la Asociación Física Argentina. Bahía Blanca, Buenos Aires, Argentina. Sep 20th-23th, 2004.
- **Critical behaviour of the screened Coulomb potential for two particle systems.** (S.A. Pighin, and P. Serra). Segundo Taller Regional de Física Estadística y

sus Aplicaciones a la Física de la Materia Condensada (TREFEMAC04). Córdoba, Córdoba, Argentina. May 27th-28th, 2004.

- Research Visits

- *Fac. de Ingeniería* (UNCo.), from 7nd to 10nd Sep 2015. Neuquén.
- *Institut de Chimie de la matière condensée de Bordeaux* (ICMCB-CNRS), from 4th Nov 2012 to 30th Jan 2013. Bordeaux, France.
- Metallurgy Group (CAB-CNEA), from 2nd Jun to 8th Jul of 2010, S. C. Bariloche, Argentina.
- *Universidade Federal do Rio Grande do Sul* (UFRGS), SeCYT-CAPES Grant, from 29th Sep to 30th Dec of 2007, Porto Alegre, Brazil.

- Other activities

- Talk at Primary School No 298, “Física de la Música” San Carlos de Bariloche, Jul and Dec 2015.
- Talk at Secondary School No 423 “El por qué de los satélites geoestacionarios”, Laguna Paiva, Dec 2014
- Participation as guide in X Semana Nacional de la Ciencia y la Tecnología (National week of Science and Technology). Bariloche, Argentina, 11th to 22nd Jun of 2013.
- Participation as guide of high school students in ”1ra Exposición Interactiva sobre el Agua” (1st Interactive Exhibition about water). Córdoba, Argentina, September 2nd-3rd, 2008.
- Invited talk at the Argentinian National Physics Olympiad: Music: if there are sounds, there are Physics. Carlos Paz, October 2009.
- Elected graduated councilor for the HCD (Faculty Council) of FaMAF-UNC from 2007 to 2008