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Grupo de Teoría de Sólidos

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Physics PhD, post-doc fellow

CONICET - Centro Atómico Bariloche

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Personal Details

Full Name	Eduardo Ezequiel Ferrero
Gender	Male
Date of birth	February 6th 1981
Place of birth	Córdoba, Argentina
Citizenship	Argentinian

Career

Since 2011 **Post-doc in Physics**, *Solid State Theory group, Centro Atómico Bariloche, Argentina.*

Topic Driven elastic interfaces in random media

Advisors Dr. Alejandro B. Kolton, Dr. Sebastián Bustingorry

Feb 2011 **Ph.D. in Physics (Doctor en Física)**, *Universidad Nacional de Córdoba, Argentina.*

— PHD THESIS

Title "Relaxational dynamics of the q-state bidimensional Potts model: a contribution to the description of first order phase transitions non-equilibrium properties".

Advisor Prof. Dr. Sergio A. Cannas

Dec 2005 **MS degree in Physics (Licenciado en Física)**, *Universidad Nacional de Córdoba, Argentina.*

— MS. THESIS

Title "Metastability in the q-state Potts model"

Advisor Prof. Dr. Sergio A. Cannas

Scientific visits

Aug-Nov 2012 **LPTMS, Université Paris Sud**, *Orsay, France*, Collaboration with Dr. Alberto Rosso.

Topic Avalanches triggered by thermal activation in driven elastic lines on disorder media

Fellowships/Scholarships

2012 **Postdoctoral Fellowship**, *collaboration CONICET-CNOUS-CROUS, Université Paris Sud, Orsay, France, "Bernardo Houssay Program".*

2011-2013 **Postdoctoral Fellowship**, *CONICET, CAB, Bariloche, Argentina.*

2009-2011 **Postgraduate Fellowship Type 2**, *CONICET, UNC, Argentina.*

2006-2009 **Postgraduate Fellowship Type 1**, *CONICET, UNC, Argentina.*

2005 **Graduate Thesis Scholarship**, *Córdoba's Governmental Science Agency, UNC, Argentina, Con-Ciencias Program.*

2004 **Interchange Scholarship**, AUGM (Montevideo Universities Association), UFPR (Universidade Federal do Paraná), Brazil, ESCALA Program.

Publications

Published research articles

6. “Dynamical heterogeneities as fingerprints of a backbone structure in Potts models”.
E.E. Ferrero, F. Romá, S. Bustingorry, P.M. Gleiser.
Physical Review E, **86**, 031121 (2012).
5. “ q -state Potts model metastability study using optimized GPU-based Monte Carlo algorithms”.
E.E. Ferrero, J.P. De Francesco, N.Wolovick and S.A. Cannas.
Computer Physics Communications, **183**, 1578 (2012).
4. “Short-time dynamics of finite-size mean-field systems”.
C. Anteneodo, E.E. Ferrero and S.A. Cannas.
Journal of Statistical Mechanics: Theory and Experiment (JSTAT), **P07026** (2010).
3. “Non-equilibrium Characterization of Spinodal Points using Short Time Dynamics”.
E.S. Loscar, E.E. Ferrero, T.S. Grigera.
Journal of Chemical Physics, **131**, 024120 (2009)
2. “Long-term ordering kinetics of the two-dimensional q -state Potts model”.
E.E. Ferrero, S.A. Cannas.
Physical Review E **76**, 031108 (2007).
1. “Phase separation of the Potts model in the square lattice”.
M. Ibáñez de Berganza, E.E. Ferrero, S.A. Cannas, V. Loreto, A. Petri.
The European Physical Journal – Special Topics, **143**, 273 (2007).

Papers in preparation

1. “Non-steady relaxation and critical exponents at the depinning transition”.
E.E. Ferrero, S. Bustingorry, A.B. Kolton.

Participation in International Schools

- Feb 2012 **Trieste, Italy**, *Advanced School on Scientific Software Development: Concept and Tools*.
- Dec 2011 **Santiago, Chile**, *Summer School and Workshop "Fluctuations and Nonequilibrium Systems 2011"*.
- Aug 2009 **Leuven, Belgium**, *International Summer School: "Fundamental Problems in Statistical Physics XII"*.
- Dec 2008 **San Carlos de Bariloche, Argentina**, *Santa Fe Institute (SFI) Complex Systems Summer School: "Foundations and Frontiers of Complex Systems"*.
- Aug 2008 **Les Houches, France**, *Les Houches Summer School "Long-Range Interacting Systems"*.
- Feb 2007 **Bento Goncalves, Brasil**, *2nd Latin American School and conference in Statistical Physics and Interdisciplinary Applications*.
- Dec 2006 **Mar del Plata, Argentina**, *Pan American Scientific Institute (PASI) Summer School: "Disorder and Complexity"*.

Oral contributions

International Congress/Schools/Workshops

- Feb 2012 **Trieste, Italy**, *Advanced School on Scientific Software Development: Concept and Tools*, **10min talk**, “GPU-implementation of the Langevin Dynamics for Driven Elastic Interfaces in Random media”.
- Aug 2009 **Leuven, Belgium**, *International Summer School: “Fundamental Problems in Statistical Physics XII”*, **5min talk**, “Non-equilibrium Characterization of Spinodal Points using Short Time Dynamics”.
- Dec 2008 **San Carlos de Bariloche, Argentina**, *SFI Complex Systems Summer School: “Foundations and Frontiers of Complex Systems”*, **group presentation**, “Network effects on game dynamics”.
- Aug 2008 **Les Houches, France**, *Les Houches Summer School “Long-Range Interacting Systems”*, **25min talk**, “Long-term ordering kinetics of the two-dimensional q -state Potts model”.

National Congress/Schools/Workshops

- May 2011 **Córdoba, Argentina**, *First Argentinian School in GPGPU Computing for Scientific Applications*, **lecture**, “GPGPU applications of Monte Carlo in spin models”.
- Sep 2010 **Malargüe, Argentina**, *95a National Physics Meeting (RNF)*, **30min talk**, “Dynamics of the ferromagnetic q -state Potts model”.
- May 2007 **San Rafael, Argentina**, *V Regional Workshop on Statistical Physics and Condensed Matter Applications (TREFEMAC)*, **30min talk**, “Long term ordering dynamics of the q -state Potts model”.

Further seminars/talks

- Aug 2011 **Córdoba, Argentina**, *FaMAF GPGPU Computing group seminars*, **60min talk** via web, “GPU Implementation of a Long-Range Φ^4 Model with Pseudo-Spectral Techniques using CUFFT”.
- Aug 2011 **Bariloche, Argentina**, *Solid State Theory Group Journal*, **60min talk**, “Simulations in GPUs: What? Why? How?”.
- Mar 2011 **Córdoba, Argentina**, *Phd Thesis defense*, **60min talk**, “Relaxational dynamics of the q -state bidimensional Potts model: a contribution to the description of first order phase transitions non-equilibrium properties”.
- Mar 2011 **Córdoba, Argentina**, *Phd Seminars*, **60min talk**, “Domain wall dynamics in disordered media”.
- Nov 2010 **Córdoba, Argentina**, *Phd Seminars*, **60min talk**, “JAMMING: a new aspirant to the phase transitions club”.
- Jun 2010 **Córdoba, Argentina**, *GTMC group Seminars*, **30min talk**, “From games to science: the future of numerical simulations using GPUs”.
- Jun 2009 **Córdoba, Argentina**, *GTMC group Seminars*, **60min talk**, “Short-time dynamics and non-equilibrium criticality”.

Posters

International Congress/Schools/Workshops

- Sep 2012 **Mainz, Germany**, *Workshop: Statistical Mechanics: Interplay of Theory and Computer Simulations*, "q-state Potts model metastability study using optimized GPU-based Monte Carlo algorithms".
- Dec 2011 **Santiago, Chile**, *Summer School and Workshop "Fluctuations and Nonequilibrium Systems 2011"*, "Dynamical heterogeneities in the q-states Potts model".
- Aug 2009 **Leuven, Belgium**, *International Summer School: "Fundamental Problems in Statistical Physics XII"*, "Non-equilibrium Characterization of Spinodal Points using Short Time Dynamics".
- Dec 2008 **San Carlos de Bariloche, Argentina**, *SFI Complex Systems Summer School: "Foundations and Frontiers of Complex Systems"*, "Network effects on game dynamics".
- Feb 2007 **Bento Goncalves, Brasil**, *2nd Latin American School and conference in Statistical Physics and Interdisciplinary Applications*, "Relaxational dynamics of the q-state Potts model".
- Dec 2006 **Mar del Plata, Argentina**, *PASI Summer School "Disorder and Complexity"*, "Relaxational dynamics of the q-state Potts model".
- Oct 2005 **San Carlos de Bariloche, Argentina**, *IX LAWNP (Latin-American Workshop on Nonlinear Phenomena)*, "Nucleation in the q-states Potts model".

National Congress/Schools/Workshops

- May 2012 **La Falda, Argentina**, *X TREFEMAC*, "A Φ^4 model implementation in GPUs: magnetic pattern study at large scale" "Universal relaxation far from equilibrium of an elastic interface in a disordered media" "Dynamical heterogeneities in the q -state Potts model" , (3 posters).
- Sep 2010 **Malargüe, Argentina**, *95a RNF*, "Short time Dynamics in finite size mean field systems".
- May 2010 **Mar del Plata, Argentina**, *VIII TREFEMAC*, " q -state Potts model simulations in GPUs" "STD in a fully connected Ising model under Glauber dynamics" , (2 posters).
- May 2009 **Santa Rosa, Argentina**, *VII TREFEMAC*, "Phase diagram and dynamical properties of a domain wall in a 2D system with perpendicular anisotropy".
- May 2008 **San Carlos de Bariloche, Argentina**, *VI TREFEMAC*, "Spinodal temperature in the q -state Potts model" "Domain wall dynamics under AC field in a bi-dimensional disordered media" , (2 posters).
- Nov 2007 **Huerta Grande, Argentina**, *Sólidos 2007*, "Domain wall movement on a 2D lattice with random local anisotropy".
- Sep 2007 **Ciudad de Salta, Argentina**, *92a RNF*, "Domain wall dynamics on a bi-dimensional lattice with random anisotropy".
- Apr 2007 **La Falda, Argentina**, *SMETIB 2007*, "Relaxational dynamics of the q -state Potts model".
- Sep 2006 **Ciudad de Merlo, Argentina**, *91a RNF*, "Anomalous coarsening at low temperatures in the q -state Potts model".
- May 2006 **Bahía Blanca, Argentina**, *IV TREFEMAC*, "Slow dynamics in the q -state Potts model".
- Sep 2005 **La Plata, Argentina**, *90a RNF*, "Nucleation in the q -state Potts model".

Languages

Spanish	Native
English	Fluid
Portuguese	Average
French	Beginner

Computer skills

OS	Linux/Unix, Windows
Programming	Fortran, C/C++, C for CUDA
Version CS	GIT, SVN
Graphics	Grace, Gnuplot
Scientific Soft	Maple, Mathematica
Libraries	RNGs, FFT, Thrust
Documents	L ^A T _E X, Microsoft Office
Codes repository	https://bitbucket.org/ezeferro

Congress/Schools/Workshops organization

- 2011 **Córdoba, Argentina**, *First Argentinean School on GPGPU Computing for Scientific Applications.*, Organizer.

Referring activity

- 2012 HPCLatAm12 proceedings published in “Cluster Computing”.

Scientific Interests

- Phase Transitions and Critical Phenomena.
- Non-equilibrium phenomena.
- Relaxational dynamics in spin systems.
- Disordered elastic systems in condensed matter.
- Spin Glasses. Dynamical heterogeneities.
- Parallel Computing. High performance computing on GPUs.
- Granular Systems. Colloids. Jamming.
- Complex systems. Social Physics. Ecology. Econophysics.

References

- Dr. Sergio A. Cannas. Professor. Universidad Nacional de Córdoba cannas@famaf.unc.edu.ar
- Dr. Alejandro A. Kolton. Research Associate. Centro Atómico Bariloche koltona@cab.cnea.gov.ar
- Dr. Sebastián Bustingorry. Research Associate. Centro Atómico Bariloche sbusting@cab.cnea.gov.ar

Teaching experience

- 2012 **Honorary teacher**, *Instituto Balseiro*, Bariloche, Argentina.
Subject: "Introduction to numerical computing in graphics processors"
- 2008-2011 **Teaching Associate**, *Facultad de Ciencias Químicas, Universidad Nacional de Córdoba*.
Subjects: "Mathematics I and II"
- 2004-2006 **Undergraduate Teaching Assistant**, *Facultad de Matemática, Astronomía y Física, Universidad Nacional de Córdoba*.
Subjects: "Algebra II", "Thermodynamics and Statistical Mechanics I and II"

Teaching material publications

- *"Mathematics I: Guide for seminars and exercise classes"*.
E. Ferrero, B. Franzoni, J. Olmos, B. Oviedo, A. Paz, C. Sánchez.
Facultad de Ciencias Químicas – Universidad Nacional de Córdoba. 54 pages, (2009)

Further academy-related activities

Membership

- since Jun 2011 Member of the GPGPU Computing Group – CAB
- since Apr 2011 Member of the Solid State Theory Group – CAB
- since Jul 2009 Member of the GPGPU Computing Group – FaMAF
- 2005 - 2011 Member of the Condensed Matter Theory Group – FaMAF
- since Sep 2002 Member of the Argentinean Physics Association

Government

- 2008 – 2011 Member of the Córdoba Subsidiary of the Argentinean Physics Association Board of Directors
- 2008 – 2010 Councilor in the Board of Governors of FaMAF (graduate senate)
- 2002 – 2003 Councilor in the Board of Governors of FaMAF (student senate)
- 2001 – 2002 Councilor in the Board of Governors of FaMAF (student senate)

Assistance

- 2011 Collaborator at Argentinean Physics Olympiad
- 2010 Collaborator at Argentinean Physics Olympiad
- 2007 Collaborator at XII Ibero-American Physics Olympiad
- 2006 Collaborator at Argentinean Physics Olympiad