

# Ezequiel Ferrero

## Physics PhD

Researcher at Bariloche Atomic Centre

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## Personal details / Datos personales

Full Name Eduardo Ezequiel Ferrero  
Profession Physicist  
Date of birth February 6th 1981  
Place of birth Córdoba, Argentina  
Citizenship Argentinian & Italian  
Personal Married, father of three (paternal leaves 2017, 2023)

## Career / Carrera

Jan 2018 - ... **Permanent Researcher**, *Condensed Matter Theory group, Centro Atómico Bariloche, Argentina, Adjunct Researcher CONICET (Argentinean National Research Council).*

April 2022 - ... **Maria Zambrano Fellow (contract)**, *Condensed Matter Department, Universidad de Barcelona, Spain, (on leave).*

Topic Active matter and complex systems (Host: Dr. Carmen Miguel)

Jan 2017 -Dec 2017 **Postdoc in Physics (contract)**, *Dipartimento di Fisica, Università degli Studi di Milano, Italia.*

Topic Glasses and disordered metamaterials

Supervisor Dr. Stefano Zapperi

May 2013 -Dec 2016 **Postdoc in Physics (contract)**, *Laboratoire Interdisciplinaire de Physique, Université Grenoble Alpes, Grenoble, France.*

Topic Amorphous solids

Supervisor Dr. Jean-Louis Barrat

Aug-Nov 2012 **Postdoc in Physics (sandwich fellowship)**, *LPTMS, Université Paris Sud, Orsay, France.*

Topic Driven elastic interfaces in random media

Supervisor Dr. Alberto Rosso

Apr 2011 - Apr 2013 **Postdoc in Physics (fellowship)**, *Solid State Theory group, Centro Atómico Bariloche, Argentina.*

Topic Disordered Elastic Systems

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

Mar 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.*

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## Scientific stays / Estadías científicas

- Nov-Dec 2021 **LIPhy, Université Grenoble Alpes and LPTMS, Université Paris Sud, Grenoble and Paris, France**, IRP-CNRS Invited Researcher, Three working weeks.
- Sep-Oct 2019 **LIPhy, Université Grenoble Alpes, Grenoble, France**, CNRS Invited Researcher, Two months stay.
- Oct-Nov 2014 **KITP, University of California, Santa Barbara, USA**, Avalanches, Intermittency, and Nonlinear Response in Far-From-Equilibrium Solids, Three working weeks.
- Aug-Nov 2012 **LPTMS, Université Paris Sud, Orsay, France**, Collaboration with Dr. Alberto Rosso, Four months stay.
- Topic Avalanches triggered by thermal activation in driven elastic lines on disorder media

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## Publications / Publicaciones

### Preprints

2. “*Consensus formation in quality-sensitive interdependent agent systems*”.  
David March, Ezequiel E. Ferrero, M. Carmen Miguel.  
*arXiv:2403.14856* (2024)
1. “*Honeybee-like collective decision making in a kilobot swarm*”.  
David March, Julia Múgica, Ezequiel E. Ferrero, M. Carmen Miguel.  
*arXiv:2310.15592* (2023)

### Published research articles

28. “*Depinning free of the elastic approximation*”.  
Alejandro B. Kolton, Ezequiel E. Ferrero, Alberto Rosso.  
*Phys. Rev. B* **108**, 174201 (2023)
27. “*Temperature dependence of fast relaxation processes in amorphous materials*”.  
Gieberth Rodriguez-Lopez, Kirsten Martens, Ezequiel E. Ferrero.  
*Phys. Rev. Materials* **7**, 105603 (2023)
26. “*The Fate of Shear-Oscillated Amorphous Solids*”.  
C. Liu, E.E. Ferrero, E.A. Jagla, K. Martens, A. Rosso, L. Talon.  
*J. Chem. Phys.* **156**, 104902 (2022)
25. “*The yielding of amorphous solids at finite temperatures*”.  
E.E. Ferrero, A.B. Kolton, E.A. Jagla  
*Phys. Rev. Materials* **5**, 115602 (2021)
24. “*Universal Critical Exponents of the Magnetic Domain Wall Depinning Transition*”.  
L.J. Albornoz, E.E. Ferrero, A.B. Kolton, V. Jeudy, S. Bustingorry, J. Curiale  
*Phys. Rev. B* **104**, L060404 (2021)
23. “*Creep motion of elastic interfaces driven on disorder*”.  
E.E. Ferrero, L. Foini, T. Giamarchi, A.B. Kolton, A. Rosso.  
*Annual Reviews: Condensed Matter Physics* **12**, 111-134 (2021)
22. “*Properties of the density of shear transformations in driven amorphous solids*”.  
E.E. Ferrero, E.A. Jagla  
*J. Phys.: Condens. Matter* **33**, 124001 (2021)
21. “*Elastic Interfaces on Disordered Substrates: From Mean-Field Depinning to Yielding*”.  
E.E. Ferrero, E.A. Jagla  
*Physical Review Letters* **123**, 218002 (2019)
20. “*Criticality in elastoplastic models of amorphous solids with stress-dependent yielding rates*”.  
E.E. Ferrero, E.A. Jagla  
*Soft Matter*, **15**, 9041 (2019).

19. “*Deformation and flow of amorphous solids: Insights from elastoplastic models*”.  
A. Nicolas, E.E. Ferrero, K. Martens, J.-L. Barrat.  
*Reviews of Modern Physics*, **90**, 045006 (2018)
18. “*Creep dynamics of athermal amorphous materials: a mesoscopic approach*”.  
C. Liu, E.E. Ferrero, K. Martens, J.-L. Barrat.  
*Soft Matter*, **14**, 8306 (2018).
17. “*Damage accumulation in silica glass nanofibers*”.  
S. Bonfanti, E.E. Ferrero, A.L. Sellerio, R. Guerra, and S. Zapperi.  
*Nano Letters* **18**, 7, 4100 (2018).
16. “*Magnetic domain wall creep and depinning: a scalar field model approach*”.  
N.B. Caballero, E.E. Ferrero, A.B. Kolton, J. Curiale, V. Jeudy, S. Bustingorry.  
*Physical Review E*, **97**, 062122 (2018).
15. “*Spatiotemporal Patterns in Ultraslow Domain Wall Creep Dynamics*”.  
E.E. Ferrero, L. Foini, T. Giamarchi, A.B. Kolton, A. Rosso.  
*Physical Review Letters*, **118**, 147208 (2017).
14. “*Inertia and universality of avalanche statistics: The case of slowly deformed amorphous solids*”.  
K. Karimi, E.E. Ferrero, J.-L. Barrat.  
*Physical Review E*, **95**, 013003 (2017).
13. “*Driving rate dependence of avalanche statistics and shapes at the yielding transition*”.  
C. Liu, E.E. Ferrero, F. Puosi, J.-L. Barrat, K. Martens.  
*Physical Review Letters*, **116**, 065501 (2016).
12. “*Edwards thermodynamics for a driven athermal system with dry friction*”.  
G. Gradenigo, E.E. Ferrero, E. Bertin, J.-L. Barrat.  
*Physical Review Letters*, **115**, 140601 (2015).
11. “*Relaxation in yield stress systems through elastically interacting activated events*”.  
E.E. Ferrero, K. Martens, J.-L. Barrat.  
*Physical Review Letters*, **113**, 248301 (2014).
10. “*Parallel kinetic Monte Carlo simulation of Coulomb glasses*”.  
E.E. Ferrero, A.B. Kolton, M. Palassini.  
*AIP Conference Proceedings*, **1610**, 71 (2014).
9. “*Uniqueness of the thermodynamic limit for driven disordered elastic interfaces*”.  
A.B. Kolton, S. Bustingorry, E.E. Ferrero and A. Rosso.  
*Journal of Statistical Mechanics: Theory and Experiment (JSTAT)*, P12004 (2013).
8. “*Numerical Approaches on Driven Elastic Interfaces in Random Media*”.  
E.E. Ferrero, S. Bustingorry, A.B. Kolton, A. Rosso.  
*Comptes Rendus Physique*, **14**, 641 (2013).
7. “*Non-steady relaxation and critical exponents at the depinning transition*”.  
E.E. Ferrero, S. Bustingorry, A.B. Kolton.  
*Physical Review E*, **87**, 032122 (2013).
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 and S.A. Cannas.  
*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).

## Press and outreach / Prensa y medios

- November 2023 **Interviewed**, *Swarm of robots can make collective decisions by imitating bees*, NewScientist 7, November 2023, By Karmela Padavic-Callaghan.
- March 2020 **Interviewed**, *A year without conferences? How the coronavirus pandemic could change research*, Nature 579, 327-328 (2020), By Giuliana Viglione.

## Fellowships-Scholarships-Awards / Becas-Premios

- 2023 **R3 certificate for established researchers**, Spanish State Research Agency (AEI), Spain.
- 2022 “**Profesor Lector**” accreditation, Catalan Agency for the Quality of the University system (AQU), Barcelona, Spain.
- 2021 “**Ayuda María Zambrano para la atracción de talento internacional**”, University of Barcelona, Barcelona, Spain.
- 2015 **Best Poster Award**, *Programming and Tuning Massively Parallel Systems summer school (PUMPS)*, Barcelona, Spain.
- 2013 **Special Mention**, in the frame of *Juan José Giambiagi Prize 2013 to the best PhD Thesis in Physics defended in the country*, Argentinean Physics Society, Argentina.
- 2012 **Postdoctoral Fellowship**, *Bernardo Houssay Program*, MESR (France) - MINCyT (Argentina), Université Paris Sud, Orsay, France.
- 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, ConCiencias Program.
- 2004 **Exchange Scholarship**, AUGM (Montevideo Universities Association), UFPR (Universidade Federal do Paraná), Brazil, ESCALA Program.

## Teaching experience / Experiencia docente

- 2022-2024 **María Zambrano fellow**, *Universitat de Barcelona*, Barcelona, Spain, TFG and TFM proposals. TFG: “Avalanchas en la deformación de sólidos amorfos” ongoing this semester.
- 2017 **Teaching Assistant**, *Università degli Studi di Milano*, Milan, Italy, Subject: “Introduction to Statistical Physics”.
- 2012, 2021 **Non-paid teaching contributions**, *Instituto Balseiro*, Bariloche, Argentina, Subject: “Introduction to numerical computing in graphics processors (ICNPG)”.
- 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). v2016

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## Scientific events organization / Organización de eventos

- 2023 **Barcelona, Spain**, *XI GEFENOL Summer School on Statistical Physics of Complex Systems*, Organizer.
- 2021 **Buenos Aires, Argentina**, *Powders&Grains 2021*, Organizer.
- 2019 **Bariloche, Argentina**, *Yielding phenomena in disordered systems: the southernmost STAT-PHYS satellite*, Organizer.
- 2016 **Grenoble, France**, *Dynamical phase transitions in driven systems: contrasting depinning and yielding*, Organizer.
- 2014 **Grenoble, France**, *Driven Disordered Systems 2014*, Organizer.
- 2011 **Córdoba, Argentina**, *First Argentinean School on GPGPU Computing for Scientific Applications*, Organizer.

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## International schools / Participación en escuelas internacionales

- Sep 2022 **Barcelona, Spain**, *Programming and Tuning Massively Parallel Systems summer school (PUMPS+AI 2022)*.
- Jul 2017 **Como, Italy**, *Advances in complex systems: Lake Como School of Advanced Studies*.
- Jul 2015 **Barcelona, Spain**, *Programming and Tuning Massively Parallel Systems summer school (PUMPS)*.
- 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"*.

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## Oral contributions / Presentaciones orales

### At international conferences/workshop/schools

- Nov 2022 **Grenoble, France**, *1ères Journées du GDR IDE "Interaction Désordre Élasticité"*, **workshop**, “The fate of shear-oscillated amorphous solids”.
- Aug 2022 **Lyon, France**, *Journées de la Matière Condensée (JMC) 2022*, **workshop**, “The fate of shear-oscillated amorphous solids”.
- June 2022 **Erice, Italy**, *Conference of the Middle European Cooperation in Statistical Physics (MECO47)*, **workshop**, “The yielding of amorphous solids at finite temperatures”.
- Sep 2021 **Spetses, Greece (virtual)**, *News from Disordered Elastic Systems*, **workshop**, “The yielding of amorphous solids at finite temperatures”.  
(invited speaker)

- Mar 2021 **USA (virtual)**, *APS March Meeting*, **conference**, “Avalanche statistics at the yielding transition of amorphous solids: universality in elastoplastic models (Abstract: V05.00003)”.
- Oct 2020 **Barcelona, Spain (virtual)**, *Workshop on Micromechanics, Statistics and Hazards of Mechanical Failure*, **workshop**, “Avalanche statistics at the yielding transition of amorphous solids: universality in elastoplastic models”.
- Feb 2019 **Les Houches, France**, *Avalanche Dynamics and Precursors of Catastrophic Events*, **workshop**, “An overview of universal avalanche statistics at the yielding transition of amorphous solids”.  
(invited speaker)
- Dec 2018 **Puerto Varas, Chile**, *Southern Workshop on Granular Materials 2018*, **workshop**, “Criticality and avalanches at the yielding transition of amorphous solids”.  
(invited speaker)
- Oct 2017 **Paris, France**, *Yielding of amorphous solids*, **workshop**, Involved chair role.
- Oct 2016 **Dijon, France**, *8th Multiscale Materials Modeling international conference*, **conference**, “Avalanche statistics when approaching (or leaving) the yielding transition of amorphous solids”.
- Jul 2016 **Lyon, France**, *STATPHYS26*, **conference**, “Spatio-temporal patterns in ultra-slow creep dynamics of magnetic interfaces”.
- Jun 2016 **Aussois, France**, *Statphys26 satellite meeting: Statistical Physics of Materials*, **workshop**, “Avalanche statistics at the yielding transition of amorphous solids - driving rate dependence and inertial effects -”.
- Jun 2016 **Lyon, France**, *CECAM Workshop: The flow of amorphous solids, from atomistic simulations to Earth Science applications*, **workshop**, “Spatio-temporal patterns in ultra-slow domain wall creep dynamics”.
- Feb 2016 **Vienna, Austria**, *41st Conference of the Middle European Cooperation in Statistical Physics*, **conference**, “Driving rate dependence of avalanche statistics and shapes at the yielding transition”.
- Jul 2015 **Barcelona, Spain**, *Programming and Tuning Massively Parallel Systems summer school (PUMPS)*, **poster intro**, “A display of GPU implementations in Condensed Matter Physics: four distinctive cases”.
- Jun 2015 **Montpellier, France**, *ANR project meeting*, Laboratoire Charles Coulomb, Université Montpellier II, **mini workshop**.  
“On the rate dependence of avalanche statistics and shapes at the yielding transition”
- May 2015 **Montpellier, France**, *International Workshop on Dynamics in Viscous Liquids*, **conference**, “Relaxation in yield stress systems through elastically interacting activated events”.
- Mar 2015 **Buenos Aires, Argentina**, *Dynamics in soft and hard condensed matter*, **conference**, “Avalanches and relaxation in mesoscopic models of amorphous solids”.
- Dec 2014 **Grenoble, France**, *FAPRES ANR project kick-off meeting*, **mini workshop**, “Relaxation in yield stress systems through elastically interacting activated events”.
- Apr 2014 **Grenoble, France**, *The CIMENT cluster users’ day*, **mini workshop**, “Mesoscopic simulations of amorphous systems using GPU-based algorithms”.
- Feb 2012 **Trieste, Italy**, *Advanced School on Scientific Software Development: Concept and Tools*, **school 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”*, **poster intro**, “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”*, **poster intro**, “Network effects on game dynamics”.



- Aug 2008 **Les Houches, France**, *Les Houches Summer School “Long-Range Interacting Systems”*, school talk, “Long-term ordering kinetics of the two-dimensional q-state Potts model”.
- As international seminars**
- Oct 2022 **Barcelona, Spain**, *Seminari FMC*, **(invited)**, “The yielding transition of amorphous solids”.
- Dec 2021 **Grenoble, France**, *Laboratoire International de Physique*, *PSM group seminars*, **visit**, “The yielding of amorphous solids at finite temperatures”.
- Jan 2021 **Amsterdam, Netherlands (virtual)**, *Computational Soft Matter Seminar*, *University of Amsterdam.*, **workshop**, “Avalanche statistics and criticality at the yielding transition of amorphous solids”.  
(invited)
- Nov 2020 **Bristol, UK (virtual)**, *Fluids and Materials seminar*, *School of Mathematics Research*, *University of Bristol.*, **workshop**, “Avalanche statistics and criticality at the yielding transition of amorphous solids”.  
(invited)
- Oct 2019 **Grenoble, France**, *Laboratoire International de Physique*, *PSM group seminars*, **visit**, “Criticality in elastoplastic models of amorphous solids with stress-dependent yielding rates”.
- Feb 2019 **Laussane, Switzerland**, *Prof. Wyart’s group meeting*, *École Polytechnique Fédérale de Lausanne*, **visit**, “An overview of universal avalanche statistics at the yielding transition of amorphous solids”.
- Nov 2017 **Segrate, Italy**, *Dipartimento di Biotecnologie Mediche e Medicina Traslazionale*, *UNIMI*, **visit**, “Deformation and flow of amorphous solids”.
- Oct 2017 **Milano, Italy**, *Center for Complexity and Biosystems annual Workshop*, **workshop**, “Deformation and flow of amorphous solids: the case of silica glass nanofibers”.
- Apr 2017 **Napoli, Italy**, *Department of Physics*, *University of Naples Federico II*, **visit**, “Criticality and avalanches at the yielding transition of amorphous solids under deformation”.
- Mar 2017 **Helsinki, Finland**, *CSM Seminar*, *Aalto University*, **visit**, “Statistics of collective dynamics on driven glassy systems”.
- Feb 2017 **Varenna, Italy**, *CC&B group retreat*, **group meeting**, “Machine Learning in Statistical Physics”.
- Nov 2016 **Grenoble, France**, *PSM group Seminars*, **group meeting**, “Non-equilibrium characterization of critical and spinodal points using Short Time Dynamics”.
- Sep 2016 **Grenoble, France**, *LIPhy Internal Seminar*, **invited**, “Critical avalanche behavior in the deformation of amorphous solids -driving rate dependence and inertial effects-”.
- May 2016 **Turin, Italy**, *Seminar*, *ISI Foundation*, **visit**, “Spatio-temporal patterns in ultra-slow domain wall creep dynamics”.
- Apr 2016 **Leipzig, Germany**, *TKM group meeting*, *Institut für Theoretische Physik*, **visit**, “Driving Rate Dependence of Avalanche Statistics at the Yielding Transition of Amorphous Solids”.
- Feb 2016 **Grenoble, France**, *PSM group Seminars*, **group meeting**, “Spatio-temporal patterns in ultra-slow creep dynamics of elastic interfaces in disordered media”.
- Oct 2015 **Laussane, Switzerland**, *Prof. Wyart’s group meeting*, *École Polytechnique Fédérale de Lausanne*, **visit**, “Avalanches at the yielding transition”.
- Jun 2015 **Barcelona, Spain**, *CondMatSem*, *Departament Física Fonamenta*, *Universitat de Barcelona*, **visit**, “Driving rate dependence of avalanche statistics and shapes at the yielding transition”.
- Mar 2015 **Grenoble, France**, *PSM group Seminars*, **group meeting**, “Discussion about avalanches in amorphous solids”.
- Mar 2015 **Córdoba, Argentina**, *Seminarios del GTMC*, *Facultad de Matemática, Astronomía y Física*, *Universidad Nacional de Córdoba*, **visit**, “Elastoplastic models of amorphous solids: avalanches and relaxational dynamics”.

- Mar 2015 **La Plata, Argentina**, *Seminarios del IFLYSIB, Instituto de Física de Líquidos y Sistemas Biológicos, Universidad Nacional de La Plata*, **visit**, “Elastoplastic models of amorphous solids: avalanches and relaxational dynamics”.
- Feb 2015 **Bariloche, Argentina**, *Seminario de Materia Condensada, Departamento de Materia Condensada, Centro Atómico Bariloche*, **visit**, “Elastoplastic models of amorphous solids: avalanches and relaxational dynamics”.
- Sep 2014 **Grenoble, France**, *PSM group Seminars*, **group meeting**, “Relaxation in amorphous systems: a timid approach to the understanding of "unexpected" experimental observations, and something beyond”.
- Feb 2014 **Grenoble, France**, *PSM group Seminars*, **group meeting**, “The heterogeneous many core era has arrived. What do we do now?”.
- Sep 2013 **Grenoble, France**, *PSM group Seminars*, **group meeting**, “A parallel kinetic Monte Carlo technique for the simulation of Coulomb glasses on Graphics Processing Units”.
- Apr 2013 **Bariloche, Argentina**, *Seminario BTT, Departamento de Materia Condensada, Centro Atómico Bariloche*, **lab seminar**, “Relaxation at the depinning transition of an elastic interface via large scale GPU simulations”.
- Nov 2012 **Barcelona, Spain**, *CondMatSem, Departament Física Fonamenta, Universitat de Barcelona*, **visit**, “Relaxation at the depinning transition of an elastic interface via large scale GPU simulations”.
- Nov 2012 **Grenoble, France**, *Séminaire du PSM, Physique Statistique et Modélisation, Laboratoire interdisciplinaire de Physique, Université Joseph Fourier*, **visit**, “Non-steady relaxation and critical exponents at the depinning transition via large scale GPU simulations”.
- Nov 2012 **Orsay, France**, *Séminaire du LPTMS, Laboratoire de Physique Théorique et Modèles Statistiques, Université Paris Sud*, **lab seminar**, “Non-steady relaxation and critical exponents at the depinning transition via large scale GPU simulations”.

#### **At national conferences/workshop/schools**

- May 2021 **Córdoba, Argentina (virtual)**, *XVIII Taller Regional de Física Estadística y Aplicaciones a la Materia Condensada, (TREFEMAC 2021)*, **workshop**, “An overview of the yielding transition of amorphous solids”.  
(contributed talk)
- Sep 2020 **Córdoba, Argentina (virtual)**, *105<sup>o</sup> Reunión de la Asociación Física Argentina, (RAFA 2020)*, **conference**, “Plastic deformation of amorphous solids: critical aspects of the yielding transition”.  
(Soft Matter Division talk)
- Apr 2019 **San Luis, Argentina**, *XVII Taller Regional de Física Estadística y Aplicaciones a la Materia Condensada, (TREFEMAC 2019)*, **workshop**, “Criticality and avalanches at the yielding transition of amorphous solids”.  
(invited speaker)
- 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)*, **conference**, “Dynamics of the ferromagnetic  $q$ -state Potts model”.
- May 2007 **San Rafael, Argentina**, *V Regional Workshop on Statistical Physics and Condensed Matter Applications (TREFEMAC)*, **conference**, “Long term ordering dynamics of the  $q$ -state Potts model”.

#### **As national seminars**

- Dec 2019 **Córdoba, Argentina**, *Facultad de Matemática, Astronomía y Física. UNC*, **visit**, “Deformación plástica de sólidos amorfos aspectos críticos de la transición de fluencia”.



- Ago 2018 **Bariloche, Argentina**, *Condensed Matter Theory Department Seminar*, **visit**, “Transición de ‘yielding’ en sólidos amorfos: fenomenología y estadística de avalanchas”.
- Mar 2013 **Bariloche, Argentina**, *Solid State Theory Group Journal*, **group journal club**, “Impact-activated solidification of dense suspensions via dynamic jamming fronts”.
- Aug 2011 **Córdoba, Argentina**, *FaMAF GPGPU Computing group seminars*, **video conf.**, “GPU Implementation of a Long-Range Phi4 Model with Pseudo-Spectral Techniques using CUFFT”.
- Aug 2011 **Bariloche, Argentina**, *Solid State Theory Group Journal*, **group journal club**, “Simulations in GPUs: What? Why? How?”.
- Mar 2011 **Córdoba, Argentina**, *Universidad Nacional de Córdoba*, **PhD thesis defense**, “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**, *Universidad Nacional de Córdoba*, **Phd Seminar**, “Domain wall dynamics in disordered media”.
- Nov 2010 **Córdoba, Argentina**, *Universidad Nacional de Córdoba*, **Phd Seminar**, “JAMMING: a new aspirant to the phase transitions club”.
- Jun 2010 **Córdoba, Argentina**, *GTMC group Seminars*, **group meeting**, “From games to science: the future of numerical simulations using GPUs”.
- Jun 2009 **Córdoba, Argentina**, *GTMC group Seminars*, **group meeting**, “Short-time dynamics and non-equilibrium criticality”.

## Posters

### At international congress/schools/workshops

- March 2021 **USA (virtual)**, *APS March Meeting*, **conference**, “Properties of the density of shear transformations in driven amorphous solids (Abstract: M71.00198)”.
- July 2016 **Lyon, France**, *STATPHYS26*, “Driving Rate Dependence of Avalanche Statistics and Shapes at the Yielding Transition”.  
(presented by co-author)
- July 2016 **Lyon, France**, *STATPHYS26*, “Effective thermodynamics for a driven athermal system with dry friction”.  
(presented by co-author)
- June 2016 **Lyon, France**, *CECAM Workshop: The flow of amorphous solids, from atomistic simulations to Earth Science applications*, “A display of GPU implementations in Condensed Matter Physics: four distinctive cases”.
- June 2016 **Lyon, France**, *CECAM Workshop: The flow of amorphous solids, from atomistic simulations to Earth Science applications*, “Driving rate dependence of avalanche statistics and shapes at the yielding transition”.  
(presented by co-author)
- Jul 2015 **Barcelona, Spain**, *Programming and Tuning Massively Parallel Systems summer school (PUMPS)*, “A display of GPU implementations in Condensed Matter Physics: four distinctive cases”.  
*Best poster award*
- Nov 2014 **Santa Barbara, USA**, *Avalanches, Intermittency, and Nonlinear Response in Far-From-Equilibrium Solids*, “Relaxation in yield stress systems through elastically interacting activated events”.
- Apr 2014 **Carry-le-Rouet, France**, *42e Congrès National d'Analyse Numérique (CANUM2014)*, “Stationary dynamics of tracer particles in an elasto-plastic model for the structural relaxation of amorphous solids ”.

- Sep 2013 **Sant Feliu de Guíxols, Barcelona, Spain**, *15th International Conference on Transport in Interacting Disordered Systems (TIDS15)*, “Parallel kinetic Monte Carlo simulation of Coulomb glasses on Graphics Processing Units”.  
(presented by co-author)
- Jul 2013 **Mendoza, Argentina**, *VI Latin American Symposium on High Performance Computing HPCLatAm 2013*, “Modeling stripe domain patterns in magnetic thin films with GPGPU computing”.  
(presented by co-author)
- Jul 2013 **Barcelona, Spain**, *7th. International Discussion Meeting on Relaxation in Complex Systems*, “Non-steady relaxation and critical exponents at the depinning transition”.
- 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”.
- Oct 2011 **San Luis Potosi, Mexico**, *XII LAWNP (Latin-American Workshop on Nonlinear Phenomena)*, “Dynamical heterogeneities in the q-states Potts model”.  
(presented by co-author)
- 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”.
- At national congress/schools/workshops**
- Apr 2019 **San Luis, Argentina**, *XVII Taller Regional de Física Estadística y Aplicaciones a la Materia Condensada, (TREFEMAC 2019)*, “Inertia and Universality of Avalanche Statistics: The Case of Slowly Deformed Amorphous Solids” “Damage Accumulation in Silica Glass Nanofibers” “Spatiotemporal Patterns in Ultraslow Domain Wall Creep Dynamics” “Creep Dynamics of Athermal Amorphous Materials: A Mesoscopic Approach” , (4 posters).
- Sep 2013 **Bariloche, Argentina**, *98a RNF*, “A Kinetic Monte Carlo massively parallel technique for simulation of Coulomb glasses on GPUs”.  
(presented by co-author)
- May 2012 **La Falda, Argentina**, *X TREFEMAC*, “A Phi4 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).
- Sep 2009 **Rosario, Argentina**, *94a RNF*, “Caracterización de no-equilibrio de puntos spinodales usando Dinámica de Tiempos Cortos”.  
(presented by co-author)
- 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”.

## Editorial activity / Actividad editorial

- since 2018 **Managing Editor**, *Papers in Physics*.  
 link **Referee**, see *Publons record*.
- since 2023 **Referee**, for *Nature Research publishing*, *Nature Reviews Physics*, review articles.
- since 2021 **Referee**, for *Nature Research publishing*, *Communications Physics*, regular articles.
- since 2020 **Referee**, for *The National Academy of Sciences*, *PNAS*, regular articles.
- since 2019 **Referee**, for *The American Chemical Society*, *Macromolecules*, regular articles.
- since 2018 **Referee**, for *The Royal Chemical Society*, *Soft Matter*, regular articles.
- since 2017 **Referee**, for *The American Physical Society*, *Physical Review Letters*, *Physical Review B*, *Physical Review E*, regular articles.
- since 2015 **Referee**, for *Springer*, *Cluster Computing (CLUS)*, regular articles.
- since 2015 **Referee**, for *Elsevier*, *Computer Physics Communications (CPC)*, regular articles.
- 2015 **Evaluator**, *Asociación Física Argentina*, Giambiagi Prize 2015.
- 2014 **Referee**, *Cluster Computing*, *HPCLatAm14* proceedings.
- 2012 **Referee**, *Cluster Computing*, *HPCLatAm12* proceedings.

## Evaluation activity / Actividad de evaluación

- Feb 2023 **Project Evaluator**, *Swiss National Science Foundation*, *Projects MINT*.
- Jan 2023 **Thesis Evaluator**, *Pontificia Universidad Católica de Chile*, Physics PhD candidate: Carlos Villaroel, *Amorphous Materials under Stresses: Understanding critical behavior*.
- 2020-2023 **Thesis Comitee**, *Pontificia Universidad Católica de Chile*, Physics PhD candidate: Carlos Villaroel.
- Dec 2022 **Thesis Evaluator**, *Instituto Balseiro. Universidad Nacional de Cuyo*, Master in Physics Thesis: Zagarra Saez, Renzo, *Simulaciones masivamente paralelas de modelos de propagación de epidemias e incendios*.
- Dec 2018 **Thesis Evaluator**, *Instituto Balseiro. Universidad Nacional de Cuyo*, Master in Physics Thesis: PUIG, Joaquín Roberto, *Termodinámica, estructura y magnetismo de nanocristales de vórtices*.
- 2012 **Project Evaluator**, *Universidad Nacional de San Luis*, *Topics*, advisors and project for a PhD Thesis in *Computational Sciences*.

## PI founded projects / Proyectos como Investigador Principal

- 2022-2025 **Director of postdoctoral fellowship**, *CONICET (Argentinean National Research Council)*, Argentina, Postdoc: Mubeena Shaikh. “Brittle and ductile behaviors of glasses at the onset of yielding: residual stresses and shear banding”.
- 2021-2024 **PIP2020**, *Argentinean National Research Council - CONICET*, Argentina, Statistical Physics of Amorphous Materials. Dir: E.E. Ferrero and E.A. Jagla.  
Active. Founded AR\$552500
- 2021-2024 **Director of postdoctoral fellowship**, *CONICET (Argentinean National Research Council)*, Argentina, Postdoc: Gieberth Rodríguez-López. “Avalanches, memory and precursors of catastrophic events in the plastic deformation of amorphous solids”.
- 2018-2020 **PICT2017**, *National Agency for Science and Technology Promotion - ANPCyT*, Argentina, Plastic Deformation of Amorphous Solids. Dir: E.E. Ferrero.  
Founded AR\$210000

## Active writing of founding projects / Redacción de proyectos

- 2019 **International Research Project (IRP): Bariloche, Bahía Blanca, Grenoble, Paris**, *CNRS*, France, Statistical Physics of Materials. Dir: V. Lecomte and A.B. Kolton.  
Granted for 2021-2025
- 2016 **ECOS-SUD call for collaboration projects**, *COFECUB ECOS-SUD Université Paris 13*, France, Avalanches and Fluctuations in the Plastic Deformation of Solids. Dir: J.-L. Barrat and E.A. Jagla.  
Granted for 2017-2019
- 2014 **GENCI call for TGCC computing hours**, *GENCI (Grand Équipement National de Calcul Intensif)*, France, Large scale simulations of plasticity and avalanches in amorphous systems: a mesoscopic approach. Dir: J.-L. Barrat.  
Granted: 40000 computing hours
- 2012 **SNCAD Economic support for workshops and courses**, *SNCAD (Sistema Nacional de Computación de Alto Desempeño)*, Argentina, Introduction to Numerical Calculus in Graphics Processors (ICNPG 2013). Dir: F. Colavecchia.  
Granted: founding for two visiting teachers and 15 student fellowships
- 2011 **NVIDIA Academic Partnership**, *NVIDIA corporation*, USA, Condensed Matter implementations in GPUs. Dir: D. Domínguez.  
Granted: 2 Fermi GPUs

## Further academy-related activities / Otras actividades

### Government

- 2022–present Member of the Nanoscience and Nanotechnology Institute (INN-CNEA-CONICET) Rules Committee
- 2021–2022 Member of the Nanoscience and Nanotechnology Institute (INN-CNEA-CONICET) Council Board (Bariloche node)
- 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)
- 2001–2002, 2002–2003 Councilor in the Board of Governors of FaMAF (student senate)

### Membership

- since 2002 Member of the Argentinean Physics Association
- 2009-2013 Member of the GPGPU Computing Group – FaMAF

### Assistance

- 2007 Collaborator at XII Ibero-American Physics Olympiad

2006, 2010, Collaborator at Argentinean Physics Olympiads  
2011

## Scientific interests / Intereses científicos

- Phase Transitions and Critical Phenomena.
- Non-equilibrium Statistical Physics.
- Magnetic Systems. Complex systems. Disordered Elastic Systems.
- Amorphous Solids. Soft Matter. Metamaterials.
- Glasses. Granular Systems. Gels.
- Active Matter. Biophysics.
- Computational Physics. GPU Computing.
- Machine Learning.

## Languages / Idiomas

Fluid Spanish, English, French  
Average Italian  
Basic Portuguese  
Learning Catalan

## Computer skills / Conocimientos en programación

OS Linux/Unix  
Programming C/C++, C for CUDA, Fortran, Python  
Utils bash, awk, sed  
Graphics Grace, Gnuplot  
Sci Soft LAMMPS  
Libraries RNGs, FFT, Thrust, CUB  
DRMs SGE, OAR, SLURM  
Version CS GIT, SVN  
Documents  $\LaTeX$ , Libre Office

### Public codes

Code repo <https://bitbucket.org/ezeferro>

**Notice:** This file contains hyperlinks / Este documento contiene enlaces web.

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