

# Horacio Castillo

## *Curriculum Vitae*

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## Education:

- 1998: **University of Illinois at Urbana-Champaign** Ph.D. in Physics.  
Advisor: Paul M. Goldbart. Thesis topic: "Statistical Mechanics of the amorphous solid state of randomly crosslinked macromolecules".
- 1993: **University of Illinois at Urbana-Champaign** M.S. in Physics.
- 1986: **Universidad de Buenos Aires, Argentina** Licenciado en Física  
(roughly equivalent to a B.A. in Physics).

## Research Experience

- 2009 - present: Associate Professor at the Department of Physics and Astronomy, Ohio University, Athens, Ohio.
- 2002 - 2009: Assistant Professor at the Department of Physics and Astronomy, Ohio University, Athens, Ohio.
- 2000 - 2002: Postdoctoral researcher at the Department of Physics, Boston University.
- 1998 - 2000: Postdoctoral researcher at the LPT, École Normale Supérieure, Paris, France.
- 1992 - 1998: Thesis research in Condensed Matter Theory, U. of Illinois at Urbana-Champaign, USA.
- 1991: Research in Condensed Matter Theory. Centro Atómico Bariloche, National Atomic Energy Commission, Bariloche, Argentina.
- 1986 - 1990: Research in Condensed Matter Theory. Department of Physics, National Atomic Energy Commission, Buenos Aires, Argentina.
- 1986: Research in Theoretical Nuclear Physics. Department of Physics, Universidad de Buenos Aires, Buenos Aires, Argentina.

## Research Funding and Support

- 2008-2013: Title: "Nanoscale and Quantum Phenomena Institute: Consolidating International Leadership and Prominence". Sponsor: Ohio University Graduate Education and Research Board, Major Program Initiative (GERB MPI). Amount: \$845,000. Role: Co-PI. PI: Arthur R. Smith. Other Co-PIs: Ido Braslavsky, Gang Chen, Alexander Govorov, Saw Wei Hla, David C. Ingram, Wojciech Jadwisnienczak, Savas Kaya, Martin E. Kordesch, Tadeusz Malinski, Hugh H. Richardson, Nancy P. Sandler, Eric A. Stinaff, Sergio E. Ulloa, Paul G. Van Patten, Ralph Whaley.
- 2008-2010: Title: "Nanoscale and Quantum Phenomena Institute (08-09)". Sponsor: Ohio University 1804 Fund. Amount: \$59,946. Role: Co-PI. PI: Arthur R. Smith. Other Co-PIs: Ido Braslavsky, Liwei Chen, Alexander Govorov, Saw Wei Hla, David C. Ingram, Wojciech Jadwisnienczak, Savas Kaya, Martin E. Kordesch, Tadeusz Malinski, Hugh H. Richardson, Nancy P. Sandler, Eric A. Stinaff, Sergio E. Ulloa, Paul G. Van Patten, Ralph Whaley.

2006-2012: Title: "Fluctuations in the dynamics of glasses". Sponsor: Department of Energy, Office of Basic Energy Sciences, Division of Materials Sciences and Engineering, Theoretical Condensed Matter Physics. Initial amount and period: \$254,987 (from August 1 2006 to November 30 2009), Renewal amount and period: \$103,539 (from December 1 2009 to November 30 2010), Second renewal \$71,000 (from December 1 2010 to June 30 2013). PI: Horacio E. Castillo.

2005-2011: Title: "Fluctuations in the non-equilibrium dynamics of structural glasses", Ohio Supercomputer Center, 100,000 CPU hours, awarded in September 2005. PI: Horacio E. Castillo.

## Mentoring of research students

May 2014 - present: Rajib Pandit, PhD dissertation in progress.

May 2012 - present: Sai Teja Pusuluri, PhD dissertation in progress.

November 2008 - December 2013: Karina Avila, MSc thesis (2008-2009) and PhD dissertation (2009-2013).

April 2008 - December 2012: Gcina Mavimbela, PhD dissertation.

September 2009 - June 2010: Steven Rogers, Honors Tutorial thesis.

April 2003 - September 2009: Azita Parsaeian, PhD dissertation.

April 2004 - July 2005: Allen Dahili. Graduated with MSc degree.

## Teaching Experience

2009 - present: Associate Professor at Ohio University, Athens. Teaching: graduate level Statistical Mechanics, graduate level Condensed Matter Physics, intermediate level Classical Mechanics, calculus-based Honors Tutorials Physics, undergraduate level algebra-based Physics, undergraduate level calculus-based Honors Tutorials Physics.

Sep 2002 - 2009: Assistant Professor at Ohio University, Athens. Teaching: undergraduate level algebra-based Physics, undergraduate level calculus-based Physics, undergraduate level calculus-based Honors Tutorials Physics, graduate level Mathematics Methods in Physics, graduate level Statistical Mechanics, graduate level Condensed Matter Physics.

1992-1993: Teaching Assistant. University of Illinois at Urbana-Champaign, Physics Dept; Graduate level: Quantum Mechanics II, Complex Variables in Physics, Basics of Advanced Mechanics; Undergraduate Level: Introductory Relativity. My duties included grading of problem sets, hour exams and final exams, and answering individual questions in my office hours.

1986-1990: Teaching Assistant. Universidad de Buenos Aires, Physics Department. Advanced undergraduate Quantum Mechanics and undergraduate Electricity and Magnetism. I was responsible for recitation sessions, and shared responsibility for designing and grading hour exams and for designing homework sets.

1984-1986: Undergraduate Teaching Assistant. Universidad de Buenos Aires, Physics Department. Undergraduate Optics and Thermodynamics for Biology and Geology majors. I was responsible for recitation sessions, labs, and shared responsibility for designing and grading hour exams.

1984-1985: Universidad de Buenos Aires; Instructor at the School of Science admission courses and at the University admission courses: Mathematics, Physics. My duties included lecturing for groups of 30 to 170 students, leading problem sessions, grading hour and final exams, and answering individual questions.

## Service

January 2015 - March 2015: member of a Faculty Senate Ad-Hoc Promotion and Tenure Hearing Committee.

Fall 2014 - present: Member of the Ohio University Faculty Senate. Member of the Educational Policies and Student Affairs Committee, the University Curriculum Council, and the Individual Course Committee.

Fall 2012 - present: Chair of the Department Undergraduate Curriculum committee.

Fall 2012 - Spring 2016: Editor of the Ohio University Nanoscale and Quantum Phenomena Institute (NQPI) newsletter.

Fall 2009 - Summer 2011: Chair of the Department Undergraduate Curriculum committee. Undergraduate coordinator for the Physics and Astronomy Department for the transition from Quarters to Semesters.

Fall 2008 - Fall 2009: Member of two of the Department working groups for the transition of Quarters to Semesters: (i) for the calculus-based Elementary Physics sequence, and (ii) for the Undergraduate Majors courses.

Winter 2007: Condensed Matter Experiment faculty search committee member.

Fall 2005 - Summer 2009: Chair of the Department Colloquium committee.

(Volunteer) 2005 - present: Judge for District Science Day and Ohio Science Day (science fairs for middle school and high school students).

(Volunteer) Fall 2005 - Spring 2006: Mentoring in the Templeton Program (an Ohio University program for talented undergraduate students from underrepresented minorities).

Spring 2004: Chair of the Colloquium for the Ohio University Condensed Matter and Surface Science Program (CMSS).

Fall 2003 - Summer 2005: Member of the Department Colloquium committee.

Member of two ad-hoc committees deciding on the adoption of textbooks for undergraduate classes.

Member or past member of eighteen PhD and MSc thesis committees.

Grant proposal reviewer for U.S. Department of Energy, U.S. National Science Foundation and for ANPCyT (National Agency for the Promotion of Science and Technology, Argentina). Reviewer for computer resource awards for the Ohio Supercomputer Center.

Referee for: Europhysics Letters, Journal of Chemical Physics, Journal of Statistical Mechanics: Theory and Experiment, Nature Communications, New Journal of Physics, Physical Review and Physical Review Letters.

### **Invited talks:**

2012: Universität Konstanz, Konstanz, Germany, Theoretische Physik Kolloquium: "Fluctuations in the Relaxation of Glasses".

2012: Institut für Theoretische Physik, Georg August Universität, Göttingen, Göttingen, Germany, Theoretisch-physikalisches Seminar: "Fluctuations in the Relaxation of Glasses".

2012: Boston University, Physics Department, Boston, MA, Condensed Matter Theory Seminar: "Fluctuations in the Relaxation of Glasses".

2010: Program: "The Physics of Glasses: Relating Metallic Glasses to Molecular, Polymeric and Oxide Glasses", Kavli Institute for Theoretical Physics, University of California, Santa Barbara. Seminar: "Does Dynamical Heterogeneity Originate in Fluctuations of the Time Variable?"

2010: Ohio State University, Materials Science and Engineering Seminar: "Fluctuations in the relaxation of glasses".

2008: Indiana University - Purdue University Indianapolis, Department of Physics Colloquium: "Fluctuations In The Relaxation of Glassy Systems".

2007: Conference on “Mechanical Behavior of Glassy Systems”, Pacific Institute of Theoretical Physics, University of British Columbia, Vancouver, Canada. Talk: “Fluctuations in the aging of structural glasses”.

2007: Workshop on “Jamming”, Aspen Center for Physics, Aspen, Colorado. Talk: “Crossover between aging and equilibrium in structural glasses”.

2006: “Workshop on Stochastic Geometry and Field Theory” Kavli Institute for Theoretical Physics, University of California, Santa Barbara. Seminar: “Time reparametrization symmetry and fluctuations in glassy systems”.

2005: 5<sup>th</sup> International Discussion Meeting on Relaxations in Complex Systems, Lille, France. Talk: “Fluctuations in the Aging of Glassy Systems”.

2005: Workshop on “Dynamics, Structure and Correlations in Glasses”, Aspen Center for Physics. Talk: “Fluctuations in the aging of structural glasses”.

2004: Brandeis University, School of Physics, Condensed Matter Seminar: “Fluctuations in the Aging of Glassy Systems”.

2004: Workshop on “Electronic Glasses”, Institute for Advanced Studies, Hebrew University, Jerusalem, Israel. Tutorial: “Models for the out of equilibrium dynamics in glassy systems: a short introduction”.

2004: University of Cincinnati, Department of Physics. Condensed Matter Seminar: “Fluctuations in the aging of glasses”.

2004: University of Akron, Department of Physics. Department Colloquium: “Heterogeneous aging in glassy dynamics”.

2003: KITP workshop: “Glassy States of Matter and Nonequilibrium Quantum Dynamics”, Kavli Institute for Theoretical Physics, University of California, Santa Barbara. Seminar: “Spatially Heterogeneous Ages in Glassy Dynamics”.

2002: Simon Fraser University, Burnaby, British Columbia, Canada. Department Colloquium: “Heterogeneous aging in short-range spin glasses”.

2002: Iowa State University, Ames, Iowa, USA. Department Colloquium: “Heterogeneous aging in short-range spin glasses”.

2002: Ohio University, Athens, Ohio, USA. Department Colloquium: “Heterogeneous aging in short-range spin glasses”.

2001: Yale University, New Haven, Connecticut, USA. Yale Condensed Matter Physics Seminar: “Theory of aging in short range spin glasses”.

2001: Cornell University, Ithaca, New York, USA. Laboratory of Atomic and Solid State Physics Seminar: “Dynamical transition in a low dimensional glassy system”.

2001: Brandeis University, Waltham, Massachusetts, USA. Condensed Matter Seminar: “Freezing in disordered systems”.

2000: Indiana University, Bloomington, Indiana, USA. Condensed Matter Seminar: “Freezing of dynamical exponents in low dimensional random media”.

2000: Brown University, Providence, Rhode Island, USA. Condensed Matter Seminar: “Freezing of dynamical exponents in low dimensional random media”.

1999: Service de Physique Théorique, CEA, Saclay, France. Statistical Physics Seminar: “The amorphous solid state of randomly crosslinked macromolecules”.

1999: LPTMS, Université de Paris Sud, Orsay, France. Seminar: “The amorphous solid state of randomly crosslinked macromolecules”.

1998: École Normale Supérieure, Paris, France. LPS-LPT joint Seminar: “The amorphous solid state of randomly crosslinked macromolecules”.

1995: University of Illinois at Urbana-Champaign, USA. Theoretical Physics Seminar: “Randomly crosslinked macromolecular networks”.

## Conferences, Workshops and Schools:

2016: APS March Meeting, Baltimore, MD. Talk: “Universal Scaling in the Aging of the Strong Glass Former SiO<sub>2</sub>” (with Katharina Vollmayr-Lee and Christopher Gorman and , presented by Katharina Vollmayr-Lee)

2015: APS March Meeting, San Antonio, TX. Talk: “Universal Aging Dynamics in SiO<sub>2</sub>” (with Christopher H. Gorman and Katharina Vollmayr-Lee, presented by Christopher H. Gorman)

2015: APS March Meeting, San Antonio, TX. Talk: “Cluster Analysis of Particle Jumps in SiO<sub>2</sub> Glass” (with Jonathan Cookmeyer, Katharina Vollmayr-Lee and Juergen Horbach, presented by Jonathan Cookmeyer)

2015: APS March Meeting, San Antonio, TX. Talk: “Spin glass model for dynamics of cell reprogramming” (with Sai Teja Pusuluri, Alex H. Lang and Pankaj Mehta, presented by Sai Teja Pusuluri)

2014: APS March Meeting, Denver, CO.

2013: 7<sup>th</sup> International Discussion Meeting on Relaxations in Complex Systems, Barcelona, Spain. Talk: “Fluctuating Phases and Fluctuating Relaxation Times in Glass Forming Liquids” (with Gcina Mavimbela and Azita Parsaeian).

2013: APS March Meeting, Baltimore, MD. Talk: “Statistical Properties of Fluctuating Local Phases and Fluctuating Local Relaxation Rates in Glass-forming Liquids” (with Gcina Mavimbela and Azita Parsaeian).

2013: APS March Meeting, Baltimore, MD. Talk: “Dynamical Heterogeneity in a Granular System Near the Jamming Transition”, (with Karina Avila and Annette Zippelius, presented by Karina Avila).

2013: APS March Meeting, Baltimore, MD. Talk: “Computer Simulations of Non-Equilibrium Dynamics in Silica” (with Christopher Gorman, Katharina Vollmayr-Lee, Horacio E. Castillo, and Azita Parsaeian, presented by Christopher Gorman).

2012: APS March Meeting, Boston, MA. Talk: “Mapping dynamical heterogeneity in structural glasses to correlated fluctuations of the time variables” (with Karina Avila and Azita Parsaeian, presented by Karina Avila).

2012: APS March Meeting, Boston, MA. Talk: “Fluctuating Relaxation Times in Glass-forming Liquids” (with Gcina Mavimbela and Azita Parsaeian, presented by Gcina Mavimbela).

2011: Ohio University NQPI retreat.

2011: International Workshop on Dynamics in Viscous Liquids, Rome, Italy.

2011: APS March Meeting, Dallas, TX. Talk: “Time reparametrization symmetry in a structural glass model” (with Gcina Mavimbela, Claudio Chamon and Leticia Cugliandolo, presented by Gcina Mavimbela).

2011: APS March Meeting, Dallas, TX. Talk: “Dynamical heterogeneities and fluctuations of the time variables in structural glasses” (with Karina Avila-Coronado and Azita Parsaeian, presented by Karina Avila-Coronado).

2010: 103<sup>rd</sup> Statistical Mechanics Conference, Rutgers University, NJ. Talk: “Fluctuations in the relaxation of glasses” (with Azita Parsaeian).

2010: Ohio University NQPI retreat. Talk: "Glasses Lose Track of Time" (with Karina Avila-Coronado)

2010: APS March Meeting, Portland, OR. Talk: "Triangular Relations in Structural Glasses" (with Karina Avila-Coronado and Azita Parsaeian, presented by Karina Avila-Coronado).

2010: APS March Meeting, Portland, OR. Talk: "Time reparametrization symmetry in a short-range p-spin model" (with Gcina Mavimbela, presented by Gcina Mavimbela).

2010: APS March Meeting, Portland, OR. Talk: "Aging of the generalized density susceptibility in a strong glass" (with Azita Parsaeian and Katharina Vollmayr-Lee, presented by Azita Parsaeian).

2009: OS-APS Meeting, Ohio Wesleyan University, Sandusky OH. Talk: "Triangular Relations in Structural Glasses" (with Karina Avila-Coronado and Azita Parsaeian, presented by Karina Avila-Coronado)

2009: OS-APS Meeting, Ohio Wesleyan University, Sandusky OH. Talk: "Fluctuations in the relaxation of a strong glass" (with Azita Parsaeian and Katharina Vollmayr-Lee, presented by Azita Parsaeian)

2009: OS-APS Meeting, Ohio Wesleyan University, Sandusky OH. Talk: "Fokker-Planck Dynamics in the Energy Domain" (with Gcina Mavimbela and Claudio Chamon, presented by Gcina Mavimbela).

2009: Ohio University NQPI retreat. Talk: "Mapping classical non-equilibrium dynamics to a 1D quantum problem" (with Gcina Mavimbela).

2009: APS March Meeting, Pittsburgh, PA. Talk: "Fokker-Planck Dynamics in the Energy Domain" (with Gcina Mavimbela and Claudio Chamon, presented by Gcina Mavimbela).

2009: APS March Meeting, Pittsburgh, PA. Talk: "Fluctuations in the relaxation of a strong glass" (with Azita Parsaeian and Katharina Vollmayr-Lee, presented by Azita Parsaeian).

2008: Ohio University NQPI retreat. Talk: "Fluctuations in structural glasses" (with Azita Parsaeian).

2008: APS March Meeting, New Orleans, LA. Talk: "Fluctuations in the aging regime of a polymer glass" (with Azita Parsaeian, presented by Azita Parsaeian).

2007: APS March Meeting, Denver, CO. Talk: "Fluctuations in the crossover from aging to equilibrium of a structural glass" (with Azita Parsaeian, presented by Azita Parsaeian).

2006: "Second International Workshop on Dynamics in Viscous Liquids", Mainz, Germany. Talk: "Fluctuations in the aging dynamics of structural glasses" (with Azita Parsaeian).

2006: APS March Meeting, Baltimore, MD. Talk: "Fluctuations and spatial correlations in the aging of a simple structural glass" (with Azita Parsaeian).

2005: APS March Meeting, Los Angeles, California, USA. Talk: "Time evolution of local fluctuations in the aging of a simple glass".

2004: Workshop on "Electronic Glasses", Institute for Advanced Studies, Hebrew University, Jerusalem, Israel. Talk: "Fluctuations in the Aging of Spin Glasses and Structural Glasses".

2004: SPIE Second International Symposium on Fluctuations and Noise, Maspalomas, Gran Canaria, Spain. Talk: "Local fluctuations in the non-equilibrium dynamics of a Lennard-Jones glass" (with Parthapratim Biswas).

2004: Symposium "Understanding Complex Systems", Department of Physics, University of Illinois at Urbana-Champaign. Talk: "Fluctuations in Glassy Dynamics".

2004: APS March Meeting, Montreal, Quebec, Canada. Talk: "Scaling relations of local correlations during aging in a simple glass-forming liquid" (with Parthapratim Biswas).

2003: Participant in the workshop “Glassy States of Matter and Nonequilibrium Quantum Dynamics”, Kavli Institute for Theoretical Physics, University of California, Santa Barbara.

2003: SPIE First International Symposium on Fluctuations and Noise, Santa Fe, New Mexico, USA. Talk: “Spatial correlations in the nonequilibrium fluctuations of spin glasses” (with C. Chamon, L. Cugliandolo and M. Kennett).

2003: APS March Meeting, Austin, Texas, USA. Talk: “Correlated fluctuations in the aging dynamics of glassy systems” (with C. Chamon, L. Cugliandolo and M. Kennett).

2002: “50<sup>th</sup> Midwest Solid State Conference” and “Workshop on Solid State Quantum Computation”, University of Illinois at Urbana Champaign, Urbana, Illinois. Talk: “Heterogeneous aging in Spin Glasses” (with C. Chamon, L. Cugliandolo and M. Kennett).

2002: Participant in the “2002 Workshop on Opportunities in Materials Theory”, National Science Foundation, Arlington, VA, and Georgetown University, Washington, DC.

2002: Participant in the workshop “Collective Phenomena in Disordered Insulators and Glassy Systems”, Aspen Center for Physics, Aspen, Colorado.

2002: Participant in the 2002 “Boulder School for Condensed Matter and Materials Physics”, Boulder, Colorado.

2002: APS March Meeting, Indianapolis, Indiana, USA. Talk: “Constraints between local correlation and local response in the aging regime of a short range spin glass” (with C. Chamon, L. Cugliandolo and M. Kennett).

2001: Greater Boston Area Statistical Mechanics Meeting, Brandeis University, Waltham, Massachusetts, USA. Talk: “A local look at aging in short range spin glasses”

2001: APS March Meeting, Seattle, Washington, USA. Talk: “Nonequilibrium dynamics in a low dimensional glass model”

2000: Greater Boston Area Statistical Mechanics Meeting, Brandeis University, Waltham, Massachusetts, USA. Talk: “Freezing of dynamical exponents in low dimensional random media”.

2000: Fifth Claude Itzykson Meeting on “Dynamics of Nonequilibrium Systems”, Service de Physique Théorique, CEA, Saclay, France.

2000: APS March Meeting, Minneapolis, Minnesota, USA. Talks: “Dynamical transition for a particle in a random potential” and “Amorphous solidification and percolation in two dimensions”.

1999: Aspen Summer Workshop on “Modern Theories of Strongly Correlated Condensed Matter”, Aspen, Colorado, USA.

1999: Stig Lundqvist Research Conference on “Quantum Phases in Electron Systems of Low Dimensions”, ICTP, Trieste, Italy.

1999: XI Workshop on “Strongly Correlated Electron Systems”, ICTP, Trieste, Italy.

1999: Jerusalem Winter School on Theoretical Physics, Jerusalem, Israel. Poster: “Critical Wave Function of Dirac Fermions in a Random Magnetic Field”.

1998: Summer School on “Topological Aspects of Low Dimensional Systems”, Les Houches, France. Talk: “Multifractal Wave Function of Dirac Fermions in a Random Magnetic Field”

1998: Conference on “Critical problems in Disordered Metals”, UCLA, Los Angeles, California, USA.

1998: APS March Meeting, Los Angeles, California, USA. Talks: “Elasticity near the vulcanization transition” and “Multifractal Exponents of the Critical Wave Function of Dirac Fermions in a Random Magnetic Field”.

1998: Winter Conference on Condensed Matter “Defects in Soft Condensed Matter”, Aspen, Colorado, USA.

1997: Summer College in Condensed Matter on “Statistical Physics of Frustrated Systems”. International Centre for Theoretical Physics, Trieste, Italy.

1996: APS March Meeting, Saint Louis, Missouri, USA. Talk: “Exact mean field theory for the amorphous solid state of vulcanized macromolecular matter.”

1994: APS March Meeting, Pittsburgh, Pennsylvania, USA. Talk: “Distribution of localization lengths in randomly crosslinked macromolecular networks.”

## **Professional Associations**

Member of the American Physical Society (APS).



## Manuscripts Under Review

- “Cellular reprogramming dynamics follow a simple one-dimensional reaction coordinate”, Sai Teja Pusuluri, Alex H. Lang, Pankaj Mehta, and Horacio E. Castillo. ([arXiv:1505.03889](#)).

## Publications in Peer Reviewed Journals

- “Universal scaling in the aging of the strong glass former SiO<sub>2</sub>”, *J. Chem. Phys.* **144**, 234510 (2016) ([arXiv:1603.06259](#)).
- “Slow and Long-ranged Dynamical Heterogeneities in Dissipative Fluids”, Karina E. Avila, Horacio E. Castillo, Katharina Vollmayr-Lee, and Annette Zippelius, *Soft Matter*, **12**, 5461-5474, (2016).
- “Strong Dynamical Heterogeneity and Universal Scaling in Driven Granular Fluids”, Karina E. Avila, Horacio E. Castillo, Andrea Fiege, Katharina Vollmayr-Lee, and Annette Zippelius, *Phys. Rev. Lett.* **113**, 025701 (2014) ([arXiv:1312.3513](#)).
- “Fluctuations in the time variable and dynamical heterogeneity in glass-forming systems”, Karina E. Avila, Horacio E. Castillo, and Azita Parsaeian, *Phys. Rev. E* **88**, 042311 (2013) ([arXiv:1210.4483](#)).
- “Mapping dynamical heterogeneity in structural glasses to correlated fluctuations of the time variables”, Karina E. Avila, Horacio E. Castillo, and Azita Parsaeian, *Phys. Rev. Lett.* **107**, 265702 (2011) ([arXiv:1007.0520](#)).
- “Time reparameterization invariance in arbitrary-range p-spin models: symmetric versus non-symmetric dynamics” Gcina A. Mavimbela and Horacio E. Castillo, *J. Stat. Mech.* (2011) P05017 ([arXiv:1011.2225](#)).
- “Equilibrium and non-equilibrium fluctuations in a glass-forming liquid”, Azita Parsaeian and Horacio E. Castillo, *Phys. Rev. Lett.* **102**, 055704 (2009) ([arXiv:0802.2560](#)).
- “Time reparametrization symmetry in spin glass models”, Horacio E. Castillo, *Phys. Rev. B* **78**, 214430 (2008) ([arXiv:0801.0014](#)).
- “Growth of spatial correlations in the aging of a simple structural glass”, Azita Parsaeian and Horacio E. Castillo, *Phys. Rev. E* **78**, 060105(R) (2008) ([arXiv:cond-mat/0610789](#)).
- “Local fluctuations in the ageing of a simple structural glass”, Horacio E. Castillo and Azita Parsaeian, *Nature Physics*, **3**, 26 (2007) ([arXiv:cond-mat/0610857](#)).
- “Local fluctuations in the non-equilibrium dynamics of a Lennard-Jones Glass”, Horacio E. Castillo and Parthapratim Biswas, in *Fluctuations and Noise in Materials*, Proceedings of SPIE, Volume 5469, edited by D. Popović, M. B. Weissman, and Z. A. Rácz, (SPIE, Bellingham WA, 2004).
- “Spatially heterogeneous ages in glassy dynamics”, Horacio E. Castillo, Claudio Chamon, Leticia F. Cugliandolo, Jose Luis Iguain, and Malcolm P. Kennett, *Phys. Rev. B*, **68** 134442 (2003) ([arXiv:cond-mat/0211558](#)).
- “Separation of time-scales and reparametrization invariance for aging systems”, Claudio Chamon, Malcolm P. Kennett, Horacio E. Castillo, and Leticia F. Cugliandolo, *Phys. Rev. Lett.* **89**, 217201 (2002) ([arXiv:cond-mat/0109150](#)).
- “Heterogeneous aging in spin glasses”, Horacio E. Castillo, Claudio Chamon, Leticia F. Cugliandolo, and Malcolm P. Kennett, *Phys. Rev. Lett.* **88**, 237201 (2002) ([arXiv:cond-mat/0112272](#)).
- “Freezing of dynamical exponents in low dimensional random media”, Horacio E. Castillo and Pierre Le Doussal, *Phys. Rev. Lett.* **86**, 4859 (2001) ([arXiv:cond-mat/0006373](#)).
- “Extensive eigenvalues in spin-spin correlations: a tool for counting pure states in Ising spin glasses”, Jairo Sinova, Geoff Canright, Horacio E. Castillo, Allan H. MacDonald, *Phys. Rev. B* **63**, 104427 (2001) ([arXiv:cond-mat/0010302](#)).

- “Semi-microscopic theory of elasticity near the vulcanization transition”, Horacio E. Castillo and Paul M. Goldbart, *Phys. Rev. E* **62**, 8159 (2000) ([arXiv:cond-mat/9909054](#)).
- “Amorphous solid state: A locally stable thermodynamic phase of randomly constrained systems”, Horacio E. Castillo, Paul M. Goldbart, and Annette Zippelius, *Phys. Rev. B* **60**, 14702 (1999) ([arXiv:cond-mat/9905326](#)).
- “Elasticity near the vulcanization transition”, Horacio E. Castillo and Paul M. Goldbart, *Phys. Rev. E* **58**, R24-R27 (1998) ([arXiv:cond-mat/9712050](#)).
- “Universality and its Origins at the Amorphous Solidification Transition”, Weiqun Peng, Horacio E. Castillo, Paul M. Goldbart, and Annette Zippelius, *Phys. Rev. B* **57**, 839 (1998) ([arXiv:cond-mat/9709250](#)).
- “Exact calculation of multifractal exponents of the critical wave function of Dirac fermions in a random magnetic field”, Horacio E. Castillo, Claudio de C. Chamon, Eduardo Fradkin, Paul M. Goldbart, and Christopher Mudry, *Phys. Rev. B* **56**, 10668 (1997) ([arXiv:cond-mat/9706084](#)).
- “Randomly crosslinked macromolecular systems: vulcanization transition to and properties of the amorphous solid state”, Paul M. Goldbart, Horacio E. Castillo, and Annette Zippelius, *Adv. Phys.* **45**, 393 (1996) ([arXiv:cond-mat/9604062](#)).
- “Distribution of localisation lengths in randomly crosslinked macromolecular networks”, P. M. Goldbart, and A. Zippelius, *Europhys. Lett.* **28**, 519 (1994).
- “Ground-state and excitation spectra of the negative-U Hubbard model”, H. E. Castillo and C. A. Balseiro, *Phys. Rev. B* **45**, 10549 (1992).
- “Collective excitations in superconductors: from Bardeen-Cooper-Schrieffer theory to Bose condensation”, J. O. Sofo, C. A. Balseiro, and H. E. Castillo, *Phys. Rev. B* **45**, 9860 (1992).
- “Hall conductivity and Fermi surface in highly correlated systems”, H. E. Castillo and C. A. Balseiro, *Phys. Rev. Lett.* **68**, 121 (1992).
- “Three-band charge fluctuation model for electron pairing: a many-body calculation”, H. Castillo, C. Balseiro, B. Alascio, and H. Ceva, *Phys. Rev. B* **40**, 224 (1989).
- “On the interplay between particle-hole and  $\Delta$ -hole phonons”, H. Castillo and F. Krmpotic, *Nucl. Phys. A* **A469**, 637 (1987).

#### Unpublished manuscripts

- “Fluctuating Phases and Fluctuating Relaxation Times in Glass Forming Liquids” Geina A. Mavimbela, Horacio E. Castillo, Azita Parsaeian, ([arXiv:1210.1249](#)).
- “Universal fluctuations in the relaxation of structural glasses”, Azita Parsaeian and Horacio E. Castillo, ([arXiv:0811.3190](#)).