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Born: June 7, 1978—Valencia, Spain

Nationality: Spanish

Current position

Assistant Professor, Universitat de València, Spain

Areas of specialization

Complex systems • Statistical Physics • Thermodynamics • Nonlinear dynamics • Cellular automata

Appointments held

2007-2014	Technische Universität München (TUM), Munich, Germany
2010-2013	Institute for Advanced Study (TUM-IAS), Munich, Germany
2017	Universitat Politècnica de València, Valencia, Spain
2018-2019	Valencian International University, Valencia, Spain
2019-	Universitat de València, Valencia, Spain

Education

2001	Licenciate in Physics, Grade A, Universitat de València, Spain
2003	MSC in Physics, Grade A, Universitat de València, Spain
2005	PhD in Physics, Summa cum laude (European Doctorate), Universitat de València, Spain
2018	Master degree in Pre-university Teaching (Mathematics), Grade A, Universitat de València, Spain

Grants, honors & awards

2001	Prize for extraordinary achievements during the degree in Physics (awarded by the University of Valencia)
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2002-2005	Training of Future Professors (FPU) grant (pre-doctoral grant awarded by the Spanish Ministry of Education)
2006	DAAD Scholarship
2007	Prize for extraordinary achievements during the doctorate (awarded by the University of Valencia)
2010-2013	Carl von Linde Junior Fellowship, Technische Universität München - Institute for Advanced Study
2019	Prize for extraordinary achievements during the Master degree in Pre-university Teaching (awarded by the University of Valencia)

Publications & talks

JOURNAL ARTICLES

J. Pellicer, V. García-Morales and M. J. Hernández, *On the demonstration of the Young-Laplace equation in introductory physics courses*, Phys. Educ. **35** (2000) 126-129

J. Pellicer, V. García-Morales, L. Guanter, M. J. Hernández and M. Dolz, *On the experimental values of the water surface tension used in some textbooks*, Am. J. Phys. **70** (2002) 705-709

V. García-Morales, J. Cervera and J. Pellicer, *Calculation of the wetting parameter from a cluster model in the framework of nanothermodynamics*, Phys. Rev. E **67** (2003) 062103

J. Cervera, V. García-Morales, and J. Pellicer, *Ion size effects on the electrokinetic flow in nanoporous membranes caused by concentration gradients*, J. Phys. Chem. B **107** (2003) 8300-8309

S. Mafe, V. García-Morales, and P. Ramirez, *Estimation of $pK(a)$ shifts in weak polyacids using a simple molecular model: effects of strong polybases, hydrogen bonding and divalent counterion binding*, Chem. Phys. **296** (2004) 29-35

V. García-Morales, T. H. Silva, C. Moura, J. A. Manzanares and F. Silva, *Ion transport through polyelectrolyte multilayers under steady-state conditions*, J. Electroanal. Chem. **569** (2004) 111-119

V. García-Morales, J. Cervera and J. Pellicer, *Coupling theory for counterion distributions based in Tsallis statistics*, Physica A **339** (2004) 482-490

S. V. P. Barreira, V. García-Morales, C. M. Pereira, J. A. Manzanares and F. Silva, *Electrochemical impedance spectroscopy of polyelectrolyte multilayer modified electrodes*, J. Phys. Chem. B **108** (2004) 17973-17982

V. García-Morales, J. Cervera and J. Pellicer, *Correct thermodynamic forces in Tsallis thermodynamics: connection with Hill nanothermodynamics*, Phys. Lett. A **336** (2005) 82-88

H. A. Santos, V. García-Morales, R. J. Roozeman, J. A. Manzanares and K. Kontturi, *Interfacial interaction between dextran sulfate and lipid monolayers: An electrochemical study*, Langmuir **21** (2005) 5475-5484

T. H. Silva, V. García-Morales, C. Moura, J. A. Manzanares and F. Silva, *Electrochemical impedance spectroscopy of polyelectrolyte multilayer modified gold electrodes: Influence of supporting electrolyte and temperature*, Langmuir **21** (2005) 7461-7467

H. A. Santos, M. Chirea, V. García-Morales, F. Silva, J. A. Manzanares and K. Kontturi, *Electro-*

- chemical study of interfacial composite nanostructures: Polyelectrolyte/gold nanoparticle multilayers assembled on phospholipid/dextran sulfate monolayers at a liquid-liquid interface*, J. Phys. Chem. B **109** (2005) 20105-20114
- M. Chirea, V. García-Morales, J. A. Manzanares, C. M. Pereira, R. Gulaboski and F. Silva, *Electrochemical characterization of polyelectrolyte/gold nanoparticle multilayers self-assembled on gold electrodes*, J. Phys. Chem. B **109** (2005) 21808-21817
- V. García-Morales and J. Pellicer, *Microcanonical foundation of nonextensivity and generalized thermostatics based on the fractality of the phase space*, Physica A **361** (2006) 161-172
- H. A. Santos, V. García-Morales, L. Murtoimäki, J. A. Manzanares and K. Kontturi, *Preparation of nanostructures composed of dextran sulfate/ruthenium nanoparticles and their interaction with phospholipid monolayers at a liquid-liquid interface*, J. Electroanal. Chem. **599** (2007) 194-202
- V. García-Morales, J. Cervera and J. A. Manzanares, *Pore entrance effects on the electrical potential distribution in charged porous membranes and ion channels*, J. Electroanal. Chem. **599** (2007) 203-208
- M. C. Martins, C. M. Pereira, H. A. Santos, R. Dabirian, F. Silva, V. García-Morales and J. A. Manzanares, *Analysis of adsorption of phospholipids at the 1,2-dichloroethane/water interface by electrochemical impedance spectroscopy: A study of the effect of the saturated alkyl chain*, J. Electroanal. Chem. **599** (2007) 367-375
- V. García-Morales and S. Mafe, *Monolayer-protected metallic nanoparticles: Limitations of the concentric sphere capacitor model*, J. Phys. Chem. C **111** (2007) 7242-7250
- V. García-Morales and K. Krischer, *Nonlocal complex Ginzburg-Landau equation for electrochemical systems*, Phys. Rev. Lett. **100** (2008) 054101
- V. García-Morales, R. W. Hoelzel and K. Krischer, *Coherent structures emerging from turbulence in the nonlocal complex Ginzburg-Landau equation*, Phys. Rev. E **78** (2008) 026215
- V. García-Morales, J. Pellicer and J. A. Manzanares, *Thermodynamics based on the principle of least abbreviated action: Entropy production in a network of coupled oscillators*, Ann. Phys (New York) **323** (2008) 1844-1858
- V. García-Morales and K. Krischer, *Normal-form approach to spatiotemporal pattern formation in globally coupled electrochemical systems*, Phys. Rev. E **78** (2008) 057201
- I. Miethé, V. Garcia-Morales and K. Krischer, *Irregular Subharmonic Cluster Patterns in an Autonomous Photoelectrochemical Oscillator*, Phys. Rev. Lett. **102** (2009) 194101
- V. Garcia-Morales and K. Krischer, *Fluctuation enhanced electrochemical reaction rates at the nanoscale*, PNAS **107** (2010) 4528-4532
- V. Garcia-Morales, A. Orlov and K. Krischer, *Subharmonic phase clusters in the complex Ginzburg-Landau equation with nonlinear global coupling*, Phys. Rev. E **82** (2010) 065202
- H. A. Santos, V. Garcia-Morales and C. M. Pereira, *Electrochemical Properties of Phospholipid Monolayers at Liquid-Liquid Interfaces*, Chem. Phys. Chem. **11** (2010) 28-41

- V. García-Morales and K. Krischer, *Kinetic enhancement in nanoscale electrochemical systems caused by non-normal distributions of the electrode potential*, J. Chem. Phys. **134** (2011) 244512
- V. García-Morales and K. Krischer, *Superstatistics in nanoscale electrochemical systems*, PNAS **108** (2011) 19535-19539
- V. García-Morales and K. Krischer, *The complex Ginzburg-Landau equation: an introduction*, Contemp. Phys. **53** (2012) 79-95
- V. García-Morales, *Universal map for cellular automata*, Phys. Lett. A **376** (2012) 2645-2657
- V. García-Morales, *Symmetry analysis of cellular automata*, Phys. Lett. A **377** (2013) 276-285
- V. García-Morales, *Origin of complexity and conditional predictability in cellular automata*, Phys. Rev. E **88** (2013) 042814
- L. Schmidt, K. Schoenleber, K. Krischer and V. García-Morales, *Coexistence of synchrony and incoherence in oscillatory media under nonlinear global coupling*, Chaos **24** (2014) 013102
- V. García-Morales, *Quantum Mechanics and the Principle of Least Radix Economy*, Found. Phys. **45** (2015) 295-332
- V. García-Morales, *Substitution systems and nonextensive statistics*, Physica A **440** (2015) 110-117
- V. García-Morales, *The $p\lambda n$ fractal decomposition: Nontrivial partitions of conserved physical quantities*, Chaos Sol. Fract. **83** (2016) 27-37
- V. García-Morales, *Fractal surfaces from simple arithmetic operations*, Physica A **447** (2016) 535-544
- V. García-Morales, *Cellular automaton for chimera states*, EPL **114** (2016) 18002
- V. García-Morales, *From deterministic cellular automata to coupled map lattices*, J. Phys. A: Math. Theor. **49** (2016) 295101
- V. García-Morales, *Digit replacement: A generic map for nonlinear dynamical systems*, Chaos **26** (2016) 93109
- V. García-Morales, *Semipredictable dynamical systems*, Comm. Nonlinear Sci. Numer. Simulat. **39** (2016) 81-98
- V. García-Morales, J. A. Manzanares and S. Mafe, *Weakly coupled map lattice models for multicellular patterning and collective normalization of abnormal single-cell states*, Phys. Rev. E **95** (2017) 042324
- V. García-Morales, *Nonlinear embeddings: Applications to analysis, fractals and polynomial root finding*, Chaos Sol. Fract. **99** (2017) 312-324
- P. Ramirez, V. García-Morales, V. Gomez, M. Ali, S. Nasir, W. Ensinger and S. Mafe, *Hybrid Circuits with Nanofluidic Diodes and Load Capacitors*, Phys. Rev. Applied **7** (2017) 064035

V. García-Morales, *Diagrammatic approach to cellular automata and the emergence of form with inner structure*, Comm. Nonlinear Sci. Numer. Simulat. **63** (2018) 117-134

V. García-Morales, *A new approach to fuzzy sets: Application to the design of nonlinear time series, symmetry breaking patterns and non-sinusoidal limit-cycle oscillations*, Chaos Sol. Fract. **128** (2019) 191-202

V. García-Morales, *Unifying vectors and matrices of different dimensions through nonlinear embeddings*, J. Phys. Complex. **1** (2020) 025008

K. Froehlich, M. Ali, P. Ramirez, J. Cervera, V. García-Morales, M. Erdmann and W. Ensinger, *Effect of cationic polyamidoamine dendrimers on ionic transport through nanochannels*, Electrochim. Acta **367** (2021) 137263

BOOK CHAPTERS

2011 V. Garcia-Morales, J. Cervera and J. A. Manzanares, *Nanothermodynamics* in K. Sattler (ed.) *Handbook of Nanophysics, Vol. 1: Principles and Methods* CRC Press-Taylor and Francis, Boca Raton (USA) ISBN 978-1-4200-7540-3 (2011), Chapter 15.

2013 V. Garcia-Morales and K. Krischer, *Turbulence and synchrony in spatially extended electrochemical oscillators* in A. Mikhailov and G. Ertl (eds.) *Engineering of Chemical Complexity* World Scientific Lecture Notes in Complex Systems, Singapore, ISBN: 978-981-4390-45-3 (2013), Chapter 12, pp. 237-260.

2015 L. Schmidt, K. Schoenleber, V. Garcia-Morales and K. Krischer, *Unusual synchronization phenomena during the electro dissolution of silicon: the role of nonlinear global coupling* in A. Mikhailov and G. Ertl (eds.) *Engineering of Chemical Complexity II* World Scientific Lecture Notes in Complex Systems, Singapore, ISBN: 978-9-8146-1612-6 (2015), Chapter 14, pp. 239-260.

2020 V. Garcia-Morales, J. Cervera and J. A. Manzanares, *Nanothermodynamics: Fundamentals and Applications* in K. Sattler (ed.) *21st Nanoscience: A Handbook, Vol 5: Exotic nanostructures and quantum systems*. CRC Press Boca Raton (USA) ISBN 9780815356264 (2020), Chapter 22.

INVITED TALKS

2006 *De la dinámica microscópica a la Termodinámica* ("From microscopic dynamics to macroscopic thermodynamics"), invited talk at the Universidad Complutense de Madrid, 22th November 2006, Madrid (Spain)

2010 *Fluctuation enhanced electrochemical reaction rates at the nanoscale* invited talk at the Humboldt-Universität Berlin, Institut für Physik-Stochastische Prozesse, 10th February 2010, Berlin (Germany)

2010 *Spatiotemporal pattern formation in chemical oscillators* invited talk at the Dipartimento de Chimica of the Università degli Studi di Modena e Reggio Emilia, 17th September 2010, Modena (Italy)

2012 *Mathematical Physics of Cellular Automata* invited talk held at the *General Assembly of the Institute for Advanced Study, TUM*, 25 April 2012. Petershausen (Germany)

2013 *Superstatistics on nanoscale electrochemical systems: an experimental challenge* invited talk at the *Discussion Workshop on New Horizons in Electrochemistry - at the Boundary to Physics and Materials Science*, 26-28 August 2013. Capri (Italy)

Teaching

2003-2005 Statistical Physics, Universitat de València, Spain
2003-2005 Experimental Techniques in Thermodynamics, Universitat de València, Spain
2004-2005 Physics of Fluids, Universitat de València, Spain
2007-2014 Nonlinear Dynamics and Complex Systems I, Technische Universität München, Munich, Germany
2007-2014 Nonlinear Dynamics and Complex Systems II, Technische Universität München, Munich, Germany
2011-2013 Nanothermodynamics, Technische Universität München, Munich, Germany
2019- Thermodynamics, Universitat de València, Spain
2019- Laboratory of Thermodynamics, Universitat de València, Spain

Service to the profession

Since 2005, regular referee for the American Physical Society (Physical Review Letters, Physical Review X, Physical Review E, Physical Review B), the American Mathematical Society, the American Chemical Society (JACS, Langmuir), Nature MacMillan (Scientific Reports), Elsevier (Physica A, Physics Letters A, Communications in Nonlinear Science and Numerical Simulation), Institute of Physics Publishing (New Journal of Physics, Journal of Physics A: Mathematical and Theoretical, Nanotechnology), EPL, Nonlinear Dynamics and Proceedings of the Royal Society A.

Regular reviewer for MathSciNet since year 2017 with 18 published reviews.

Spoken languages

English, German, Catalanian and Spanish (mother tongue)