

CURRICULUM VITAE

Gonzalo Gutiérrez G; july, 2025

I. PERSONAL INFORMATION

Nationality : Chilean
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Summary

I completed my secondary education at the Coeducational High School of Quilpué and earned a Bachelor's degree in Physics from the University of Chile. During that period, I was actively involved in the reconstruction of the student movement and the broader pro-democracy mobilizations, serving in the FECh Constituent Assembly (1984) and as President of the Faculty of Sciences Student Union (1985).

I pursued graduate studies at the Pontifical Catholic University of Chile, obtaining a Master's and a PhD in Physics. From 1998 to 2000, I held a postdoctoral position at Uppsala University in Sweden, and upon returning to Chile in 2000, I joined the University of Santiago as an Associate Researcher.

Since 2004, I have been with the Department of Physics at the University of Chile, focusing on materials physics, computer simulation, statistical mechanics, and energy-related topics, including lithium and critica materials. I have led and collaborated in Anillo, FONDECYT, IAEA, and other research projects.

I teach at undergraduate and graduate levels and have supervised eight PhD theses and five postdoctoral researchers. I have published over 90 scientific papers and held visiting positions at universities in the Americas, Europe, and India. I've also served as consultant and reviewer for journals and research bodies, been on the editorial board of Materials Discovery (Elsevier), and represented Chile at the Latin American Center for Physics (CLAF). I am currently an Associate Member of the ICTP South American Institute for Fundamental Research in Brazil.

In public service, I served as President of the Chilean Commission for Nuclear Energy (2009–2010) and the Chilean Physical Society (2015–2017). I have worked as a scientific advisor to the Central Workers' Union (CUT) and as a member of the Advisory Council of the Ministry of the Environment (2012–2016). Also, I was a member of the National Lithium Commission (2014–2015), the Nuclear Power Energy Committee, and the Non-Metallic Mining Committee of CORFO (2016–2018), and coordinated the University of Chile's Lithium and Salars Network. From 2022 to 2024, I advised the Minister of Mining on lithium and salars policy.

Within the academic sphere, I have served as Department and Faculty Councilor, and as a University Senator at the University of Chile from 2018 to 2022. During this period, I chaired the Budget and Management Committee and served as Vice President of the University Senate (2018–2019). I am currently a member of the Board of Directors of the University of Santiago de Chile.

II. EDUCATION

- Secondary Education: Coeducational High School of Quilpué, 1976–1979.
- Higher Education:
 - Ph.D. in Physics, Faculty of Physics, Pontifical Catholic University of Chile, Santiago, Chile, September 1997. CONICYT doctoral fellowship, 1994–1997.
Thesis: “Amorphous solids and amorphization: a study via molecular dynamics”
Advisors: Prof. Miguel Kiwi (PUC, Chile) and Prof. Priya Vashishta (LSU, USA)
 - Master’s Degree in Physics, Pontifical Catholic University of Chile, Santiago, 1993.
PUC Fellowship.
 - Bachelor’s Degree* in Physics, University of Chile, Santiago, 1985. Top graduating student.

III. AREAS OF WORK

- Condensed Matter Physics, Theory:
 - Structural, dynamical, and electronic properties of materials. Crystalline, amorphous, and liquid states. Mechanical properties of metals. Radiation damage. Metallic glasses. Materials under extreme conditions. Materials for energy. Lithium. Critical materials.
 - Thermodynamics and Statistical Mechanics: finite-size effects, MaxEnt and MaxCal methods, spin systems. Energy, energy efficiency, and environment.
 - Computational Physics: classical and *ab initio* molecular dynamics, Monte Carlo methods, electronic structure calculations, algorithms.

IV. PROFESSIONAL EXPERIENCE

- **Current Position:**
 - Faculty Member, Department of Physics, Faculty of Sciences, University of Chile.
 - Associate Member, *ICTP South American Institute for Fundamental Research*, Brazil.
 - Director, Nanomaterials Group, www.gnm.cl
- 2022–2024: *Senior Advisor of Lithium and Salars*, Full Time, Ministry of Mining, Chile.
- 2004–March 2022: Faculty Member, Faculty of Sciences, University of Chile.
- 2018–2019: Vice President of the University Senate, University of Chile; University Senator, 2018–2022.
- 2016–2018: Member, Non-Metallic Mining Committee, CORFO.
- 2015–2017: President, Chilean Physical Society.
- 2014–2015: Member, National Lithium Commission.
- 2012–2016: Member, Advisory Council, Ministry of the Environment (www.mma.gob.cl).
- 2012–2016: Scientific Advisor to the Central Workers’ Union (CUT, www.cutchile.org).
- 2015: Member, Nuclear Power Energy Committee.

- 2009–2010: President, Chilean Commission for Nuclear Energy (CCHEN, www.cchen.cl), appointed by President Michelle Bachelet.
- 2007–2010: Director, Anillo Project ACT-24: *Computer simulation lab of nanobio systems*.
- 2000–2004: University of Santiago, Chile:
 - Associate Researcher, Department of Physics.
- 1998–2000: Uppsala University, Sweden:
 - Postdoctoral Fellow, Condensed Matter Theory Group (Prof. Börje Johansson), Faculty of Science and Technology.
- 1997–1998: University of Chile, Faculty of Sciences:
 - Postdoctoral Researcher
- 1995, 1996: Department of Physics and Astronomy, Louisiana State University, USA:
 - Visiting Researcher, Concurrent Computing Laboratory for Materials Simulations (Professors Rajiv Kalia and Priya Vashishta)
- 1994: Pontifical Catholic University of Chile, Santiago:
 - *System Manager of the Computational Laboratory*, composed of several Linux-based PCs, Faculty of Physics.

V. RESEARCH AND DEVELOPMENT PROJECTS

I have served as Principal Investigator (PI) in 15 competitive research projects and as Co-Investigator in 9 others. Among them:

- Principal Investigator (PI), FONDECYT project: *Maximum Entropy and Maximum Caliber principles in Computational Statistical Mechanics: from fundamentals to applications*, 2017–2021.
- Associate Researcher, Anillo Project ACT-1115: *Plasma physics, pulsed power, and cell biology for energy, life, and the environment*, 2012–2016.
- Principal Investigator (PI), FONDECYT project 1120603: *Mechanical properties of bulk metallic glasses: a computer simulation study*, 2012–2014.
- Co-PI, IM2–Codelco Project: *Mechanical properties for copper products*, 2012–2013.
- Co-PI, Joint Research Project Conicyt (Chile) – ANPCyT (Argentina): *Innovative concepts for nuclear energy: fusion–fission symbiosis*, 2012–2014. (PI: Dr. L. Soto, CCHEN)
- Co-PI, International Atomic Energy Agency (IAEA) project: *Investigations of Materials under High Repetition and Intense Fusion–relevant Pulses*, 2012–2014.
- External Collaborator, NANO-EXTREM project: *Development and characterization of nanostructured materials under extreme conditions in energy generation systems*, Ministry of Economy and Competitiveness, Spain; Technical University of Madrid, 2012–2015.

Between 1995–2010: Principal Investigator in seven projects, Co-PI in two, collaborator in one, and Principal Investigator in four FONDECYT international cooperation projects. Among them:

- Director, Anillo Project ACT-24: *Computer simulation lab for nano-bio systems*, Bicentennial Program – Chile (CLP 450,000,000 for 3 years), 2007–2010.
- Principal Investigator, AFOSR–USA Project: *Thermophysical modeling of novel machinable ceramics*, US\$20,000 per year, 2007–2010.
- Principal Investigator in four FONDECYT–Chile projects.

VI. PUBLICATIONS

Over 90 papers indexed in Web of Science (WoS) (see <https://orcid.org/0000-0003-0676-0089> for the full list); with more than 2350 citations (1 article with over 440 citations, 1 with over 320, 3 with over 100), h-index = 23.

a) Peer-reviewed articles, since 2014

1. G Gutiérrez, D Ruiz-León
Lithium in Chile: present status and future outlook
Materials Advances 5 (20), 7850-7861 (2024)
2. J Wachter, N Amigo, G Gutiérrez, A Zúñiga
Atomic scale study of the impact of metallic glass nanoparticles at high velocities
Journal of Non-Crystalline Solids 628, 122866 (2024)
3. F Corvacho, V Muñoz, M Sepúlveda-Macías, G Gutiérrez
Shear deformation in CuZr metallic glass: A statistical and complex network analysis
Materials Today Communications 38, 108298 (2024)
4. JM Gonzalez, G Gutierrez, B Maulén, G Miño-Galaz
N-methyl acetamide asymmetric vibrational activation
Theoretical Chemistry Accounts 142 (10), 98 (2023)
5. S Davis, G Gutiérrez
Divergence theorem in Bayesian probability under constraints
AIP Conference Proceedings 2731 (1) (2023)
6. K Gaurav, B SanthiBhushan, G Gutierrez, R Ahuja, A Srivastava
Trans-polyacetylene based organic spin valve for a multifunctional spin-based device: A first principle analysis
Journal of Science: Advanced Materials and Devices 7 (3), 100459 (2022)
7. G Gutiérrez, S Davis, C Esparza
Temperature in magnetic systems: Evolution towards thermal equilibrium by spin dynamics simulation
Physica A: Statistical Mechanics and its Applications 591, 126729 (2022)
8. JM Yáñez, G Gutiérrez, F González-Cataldo, D Laroze
An exact solution for a particle in a velocity-dependent force field
American Journal of Physics 89 (12), 1103-1112 (2021)
9. V Olguín-Arias, S Davis, G Gutiérrez
Statistical approaches to the problem of homogeneous melting of solids in the microcanonical ensemble
Journal of Physics: Conference Series 2090 (1), 012032 (2021)

10. K Gaurav, B SanthiBhushan, G Mino-Galaz, G Gutierrez, A Srivastava
Hybridization and torsion defects influenced electron transport in trans-polyacetylene
Physica E: Low-Dimensional Systems and Nanostructures 129, 114628 2 (2021)
11. S Davis, F González-Cataldo, G Gutiérrez, G Avaria, B Bora, J Jain,
A model for defect formation in materials exposed to radiation
Matter and Radiation at Extremes 6 (1), 015902 3 (2021)
12. V Olguín-Arias, S Davis, G Gutiérrez
A general statistical model for waiting times until collapse of a system
Physica A: Statistical Mechanics and its Applications 561, 125198 3 2021
13. M Sepúlveda-Macias, G Gutierrez, F Lund
Precursors to plastic failure in a numerical simulation of CuZr metallic glass
Journal of Physics: Condensed Matter 32 (17), 174003 (2020)
14. Sergio Davis, Gonzalo Gutiérrez
Emergence of Tsallis statistics as a consequence of invariance
Physica A: Statistical Mechanics and its Applications 533, 122031 2 (2019)
15. Germán Miño-Galaz, José M Gonzalez, Juan Pablo Staforelli, Gonzalo Gutiérrez
Asymmetrical vibrational energy propagation through double or single bonds of small organic molecules. An ab-initio molecular dynamics study
Chemical Physics Letters 730, 220-226 (2019)
16. Vivian Olguín-Arias, Sergio Davis, Gonzalo Gutiérrez
Extended correlations in the critical superheated solid
Journal Of Chemical Physics 151 (064507) 1 (2019)
17. Nicolás Amigo, Matías Sepúlveda-Macías, Gonzalo Gutiérrez
Enhancement of mechanical properties of metallic glass nanolaminates via martensitic transformation: Atomistic deformation mechanism
Materials Chemistry and Physics 225, 159-168 3 (2019)
18. G Miño-Galaz, JP Staforelli, G Gutierrez
Effect of double or single bonding in CH stretching signal propagation in organic molecules. A computational study
Chemical Physics Letters 714, 178-184 (2019)
19. Gonzalo Gutiérrez, Sergio Davis, Guillermo Palma
Configurational temperature in constrained systems: the case of spin dynamics
Journal of Physics A: Mathematical and Theoretical 51, 455003 (2018)
20. Sergio Davis, Diego González, Gonzalo Gutiérrez
Probabilistic Inference for Dynamical Systems
Entropy 20(9), 696, 1-11 (2018)
21. Sergio Davis, Gonzalo Gutiérrez
Temperature is not an observable in superstatistics
Physica A: Statistical Mechanics and its Applications 505, 864-870, (2018)
22. Matías Sepúlveda-Macias, Nicolás Amigo, Gonzalo Gutiérrez
Tensile behavior of Cu 50 Zr 50 metallic glass nanowire with a B2 crystalline precipitate,
Physica B: Condensed Matter 531, 64-69 (2018)

23. D González, A Tamburrini, S Davis, J Jain, G Gutiérrez
Expectation values of general observables in the Vlasov formalism,
Journal of Physics: Conference Series 1043 (1), 012008 (2018)
24. F González-Cataldo, F Corvacho, G Gutiérrez
Melting curve of Si by means of the Z-method,
Journal of Physics: Conference Series 1043 (1), 012038 (2018)
25. G Cáceres, F González-Cataldo, G Gutiérrez
Normal Modes in Graphene for Different Geometries,
Journal of Physics: Conference Series 1043 (1), 012041 (2018)
26. S Davis, J Jain, D González, G Gutiérrez *Implications of Superstatistics for steady-state plasmas,*
Journal of Physics: Conference Series 1043 (1), 012011 (2018)
27. M Sepúlveda-Macías, G Gutiérrez, F Lund *Strain rate and temperature effect on Zr50Cu50 metallic glass under pure shear,* Journal of Physics: Conference Series 1043 (1), 012040 (2018)
28. Nicolás Amigo, Matías Sepúlveda-Macías, Gonzalo Gutiérrez
Martensitic transformation to monoclinic phase in bulk B2-CuZr,
Intermetallics 91, 16-21 (2017)
29. Felipe González-Cataldo, Gonzalo Gutiérrez, Julio Yáñez
Sliding down an arbitrary curve in the presence of friction,
American Journal of Physics 85, 108 (2017)
30. Felipe González-Cataldo, Sergio Davis, Gonzalo Gutiérrez
Melting curve of SiO₂ at multimegabar pressures: implications for gas giants and super-Earths,
Scientific Reports 6, Article number: 26537 (2016)
31. Guillermo Palma, Gonzalo Gutiérrez, Sergio Davis
Ensemble-free configurational temperature for spin systems,
Phys. Rev. E 94, 062113 (2016)
32. Matías Sepúlveda-Macías, Nicolás Amigo, Gonzalo Gutiérrez
Onset of plasticity and its relation to atomic structure in CuZr metallic glass nanowire: a molecular dynamics study,
Journal of Alloys and Compounds 655, 357-363 (2016)
33. Sergio Davis, Joaquín Peralta, Yasmín Navarrete, Diego González, Gonzalo Gutiérrez,
A Bayesian Interpretation of First-Order Phase Transitions,
Foundations of Physics 46, Issue 3, pp 350-359 (2016)
34. Emilio Figueroa, Diego Tramontina, Gonzalo Gutiérrez, Eduardo Bringa,
Mechanical properties of irradiated nanowires – A molecular dynamics study,
Journal of Nuclear Materials 467, 677-682 (2015)
35. Germán A. Miño-Galaz, Gonzalo Gutiérrez,
Hydrogen bonds and asymmetrical heat diffusion in α -helices. A computational analysis,
Chemical Physics Letters 635, 16–22 (2015)

36. L. Soto, C. Pavez, J. Moreno, M. J. Inestrosa-Izurieta, F. Veloso, **G. Gutiérrez**, J. Vergara, A. Clause, H. Bruzzone, F. Castillo, L. F. Delgado-Aparicio, *Characterization of the axial plasma shock in a table top plasma focus after the pinch and its possible application to testing materials for fusion reactors*, *Physics of Plasmas* **21**, 122703, 1-6 pp (2014)
37. J. Peralta, **G. Gutiérrez**, *Pressure-induced structural transition in amorphous GeO₂: a molecular dynamics simulation*, *European Physical Journal B* **87:257**, 9 pp (2014)
38. J. Wachter, **G. Gutiérrez**, A. Zúñiga, R. Palma, *Buckling of Cu-Zr based metallic glasses nanowires: molecular dynamics study of surface effects*, *Journal of Materials Science* 49, Issue 23, pp 8051-8056(2014)
39. G. Miño, R. Barriga, **G. Gutiérrez**, *Hydrogen Bonds and Heat Diffusion in α -Helices. A Computational Study*, *The Journal of Physical Chemistry B* **118**, 10025 (2014)
40. D. González, S. Davis, **G. Gutiérrez**, *Newtonian Dynamics from the principle of Maximum Caliber*, *Foundations of Physics* **4**, 923 (2014)
41. S. Davis, Y. Navarrete, **G. Gutiérrez**, *A maximum entropy model for opinions in social groups*, *European Physical Journal B* **87**, 87:78 pp.1-7(2014)
42. N. Amigo, **G. Gutiérrez**, M. Ignat, *Atomistic simulation of single crystal copper nanowires under tensile stress: Influence of silver impurities in the emission of dislocations*, *Computational Materials Science* **87**, 76 (2014)
43. **G. Gutiérrez**, *Antecedents and perspectives on the development of nuclear energy in Chile*, *Journal of Physics: Conference Series* **511**, 012089, 8 pages (2014)
Ver también: *Inaugural Speech*, at the 15th International Congress on Plasma Physics (ICPP2010) & 13th Latin American Workshop on Plasma Physics (LAWPP2010), Santiago, Chile, 8-13 August 2010. *Journal of Physics: Conference Series* **511**, 011003, 3 pages (2014)

b) Book Chapters

1. **G. Gutiérrez**, S. Davis, C. Loyola, J. Peralta, F. Gonzalez, Y. Navarrete and F. Gonzalez-Wasaff, *Inelastic Collisions and Hypervelocity Impacts at Nanoscopic Level: A Molecular Dynamics Study*, in *Molecular Dynamics – Theoretical Developments and Applications in Nanotechnology and Energy*, Chapter 12 (2012), ISBN: 978-953-51-0443-8.
2. **Leopoldo Soto** (Chairman), Marcelo Zambra, Marcelo Loewe, **Gonzalo Gutiérrez**, Mario Molina, Felipe Barra, Fernando Lund, Carlos Saavedra and Patricio Haberle, *Physics*, Chapter 11, in *Analysis and Projections of Chilean Science 2005* (Allende, J.E., Babul, J., Martinez, S. and Ureta, T., eds.), Chilean Academy of Sciences, pp. 223-237, Santiago, 2006.

3. **G. Gutiérrez** and F. Melo,

What Are Things Made Of?, in Explora Bulletin No. 18, pp. 8–10, May 2006.

c) Others: several articles in conference proceedings, opinion columns, outreach writings, and articles in Spanish.

VI. SUPERVISION OF THESES AND TEACHING EXPERIENCE

Supervisor: I have supervised eight doctoral theses, four master's theses, and five post-doctoral researchers. I have also served as advisor for more than thirty undergraduate theses.

PhD thesis advisor for:

– Joaquín Peralta (Dept. of Physics, Faculty of Sciences, University of Chile): *Physical properties of complex materials through computational simulation*, MECESUP fellow, graduated May 2010. Currently faculty at Universidad Andrés Bello.

– Claudia Loyola (Dept. of Physics, Faculty of Sciences, University of Chile): *Atomic-level study of materials via computational simulation*, CONICYT fellow, graduated June 2010. Currently faculty at Universidad Andrés Bello.

– Felipe González (Dept. of Physics, Faculty of Sciences, University of Chile): *Materials under extreme conditions*, graduated March 2015. Assistant Scientist, University of California, Berkeley.

– Javier Wachter (Dept. of Materials, Faculty of Physical and Mathematical Sciences, University of Chile): *Study of deformation in metallic glasses subjected to impacts*, graduated April 2016. Faculty at UTEM.

– Matías Sepúlveda (Dept. of Physics, Faculty of Sciences, University of Chile): *Structure–property relationship in metallic glasses*, graduated July 2018. Postdoc at Université de Lyon and Universidad de Chile.

– Diego González (Dept. of Physics, Faculty of Sciences, University of Chile): *Maximum Caliber Theory*, graduated January 2019. Senior Analyst, Banco Itaú.

– Ignacio Tapia (Dept. of Physics, Faculty of Sciences, University of Chile): *Characterization of irreversible phenomena within the framework of the Maximum Caliber Principle*, graduated July 2023. Part-time Lecturer at UTFSM and Universidad de Chile.

– Fernando Corvacho (Dept. of Physics, Faculty of Sciences, University of Chile): *Deformation and mechanical properties of metallic glasses via complex networks*, graduated April 2024. Postdoc at USACH.

Postdoctoral supervisor for:

– Dr. Eduardo Menéndez-Proupin, fellowship from the *Third World Academy of Sciences* (TWAS), Trieste, Italy, April–December 2003, at University of Santiago.

– Dr. Pablo Encina, fellowship from *Fondecyt–Chile*, 2008–2010.

– Dr. Sergio Davis, fellowship from *Fondecyt–Chile*, 2010–2011.

– Dr. Germán Miño, fellowship from *Fondecyt–Chile*, 2010–2013.

– Dr. Emilio Figueroa, supported by Conicyt (Chile)–ANPCyT (Argentina), 2012–2014.

Teaching experience: More than 25 years of experience teaching undergraduate and graduate courses, including Classical Mechanics, Thermodynamics, Waves and Optics, Mathematical Methods for Physics, Quantum Mechanics, Statistical Mechanics, Solid State Physics, and Computational Physics, among others, at various universities.

He has created several elective courses at both undergraduate and graduate levels, such as Computational Simulation of Materials, Nonequilibrium Physics, Stochastic Processes, and Electronic Structure of Solids, among others.