

LUIS CONSTANTINO GARCÍA-NARANJO ORTIZ DE LA HUERTA

Curriculum Vitæ¹

Dipartimento di Matematica “Tullio Levi-Civita”
Università di Padova, Via Trieste 63, 35121 Padova, ITALY
<https://www.math.unipd.it/~garciana>
luis.garcianaranjo@math.unipd.it

EDUCATION

- Ph.D in Applied Mathematics University of Arizona, USA, 2007. Advisor: Hermann Flaschka.
 - M.S. in Applied Mathematics, University of Arizona, USA, 2004.
 - B.S. in Mathematics (Summa Cum Laude) UNAM, Mexico, 2000.
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EMPLOYMENT

- 01/2021 - Present. Professore associato, Università di Padova, Italy.
 - 04/2017 - 12/2020. Profesor Titular A, IIMAS-UNAM, Mexico.
 - 03/2013- 03/ 2017. Profesor Asociado C, IIMAS-UNAM, Mexico.
 - 10/2012- 02/2013. Postdoc, UPC, Barcelona, Spain.
 - 01/2012 - 07/2012. Profesor visitante, ITAM, Mexico.
 - 09/2007- 08/2011. Postdoc. EPFL, Switzerland.
 - 09/2001 - 06/2007. Graduate teaching assistant, University of Arizona, USA.
 - Summer 2002. Internship at Los Alamos National Laboratory, USA.
 - 09/1998 - 06/2000. Undergraduate Teaching Assistant, UNAM, Mexico.
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INTERNATIONAL FELLOWSHIPS

- 2017 - 2019. Georg Forster Research Fellowship for Experienced Researchers. Alexander Von Humboldt Foundation, Germany.
 - 2015 - 2017. Newton Advanced Fellowship. Royal Society, Great Britain.
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OTHER FUNDING AND AWARDS

- 2022. National scientific qualification as Full Professor in Mathematical Physics awarded by the Italian Ministry of University and Research.
- 2020. Level 2 qualification in the National System of Researchers in Mexico (SNI) (Previously in Level 1 during the period 2013-2019.)
- 2019. National scientific qualification as Associate Professor (Profesor Titular) awarded by the Spanish Ministry of Science, University and Innovation.
- 2020 - 2022. Research Grant PAPIIT-IN115820, UNAM, Mexico, for research in nonholonomic systems.
- 2015 - 2016. Research Grant PAPIIT-IA103815, UNAM, Mexico, for research in nonholonomic systems.
- 2018. CONACyT Project grant 293014 for the organization of the international conference *VI Iberoamerican Meeting on Geometry, Mechanics and Control*.

¹Updated April 23rd, 2024

- 2003 - Outstanding Graduate Teaching Award. Mathematics Department, University of Arizona.
 - 2000-2001 - Graduate College Fellowship - University of Arizona.
 - 2000- 2005 - CONACYT, Mexico, fellowship to pursue PhD abroad.
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LONG VISITS TO INTERNATIONAL RESEARCH CENTERS

- 2019: TU-Berlin, Germany (10 months).
 - 2017-2018: TU-Berlin, Germany (8 months).
 - 2016: University of Manchester, UK (3 months).
 - 2015: University of Manchester, UK (3 months). TU-Berlin, Germany (3 weeks).
 - 2014: Swiss TPH, Basel (3 weeks).
 - 2011: UPC Barcelona (4 weeks). University of Padova (6 weeks).
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PUBLISHED PAPERS

29. García-Azpeitia C. and García-Naranjo L. C.,
Platonic solids and symmetric solutions of the N -vortex problem in the sphere.
J. Nonlinear Sci. **32**, 39 (2022).
<https://doi.org/10.1007/s00332-022-09792-y>
28. García-Naranjo L. C. and Vermeeren M.,
Structure preserving discretization of time-reparametrized Hamiltonian systems with application to nonholonomic mechanics.
J. Comput. Dyn. **8**, (2021) 241–271.
<https://doi.org/10.3934/jcd.2021011>
27. García-Naranjo L. C.,
Some remarks about the centre of mass of two particles in spaces of constant curvature.
J. Geom. Mech. **12**, (2020) 435–446.
<https://doi.org/10.3934/jgm.2020020>
26. García-Naranjo L. C. and Montaldi J.,
Attracting and repelling 2-body problems on a family of surfaces of constant curvature.
J. Dyn. Diff. Equat. **33**, 1579–1603 (2021).
<https://doi.org/10.1007/s10884-020-09868-x>
25. García-Naranjo L. C. and Marrero J. C.,
The geometry of nonholonomic Chaplygin systems revisited.
Nonlinearity **33**, (2020) 1297–1341.
<https://doi.org/10.1088/1361-6544/ab5c0a>
24. García-Naranjo L. C.,
Integrability of the n -dimensional axially symmetric Chaplygin sphere.
Reg. and Chaot. Dyn. **24**, (2019) 450–463.
<https://doi.org/10.1134/S1560354719050022>
23. García-Naranjo L. C.,
Hamiltonisation, measure preservation and first integrals of the multi-dimensional rubber Routh sphere.
Theoretical and Applied Mechanics, **46** (2019) 65–88.
<https://doi.org/10.2298/TAM190130004G>
22. García-Naranjo L. C.,
Generalisation of Chaplygin’s Reducing Multiplier Theorem with an application to multi-dimensional nonholonomic dynamics.

- J. Phys. A: Math. Theor.* **52** (2019) 205203 (16pp).
<https://doi.org/10.1088/1751-8121/ab15f8>
21. Fassò, F., García-Naranjo L. C., and Montaldi J.,
Integrability and dynamics of the n -dimensional symmetric Veselova top.
J. Nonlinear Sci. **29**, (2019) 1205–1246.
<https://doi.org/10.1007/s00332-018-9515-5>
20. Borisov, A. V., García-Naranjo L. C., Mamaev I. S. and Montaldi J.,
Reduction and relative equilibria for the 2-body problem in spaces of constant curvature.
Celestial Mech. Dynam. Astronom. **130**, (2018) 130:43.
<https://doi.org/10.1007/s10569-018-9835-7>
19. Fassò F., García-Naranjo L. C. and Sansonetto N.,
Moving energies as first integrals of nonholonomic systems with affine constraints.
Nonlinearity **31**, (2018) 755–782.
<https://doi.org/10.1088/1361-6544/aa9837>
18. García-Naranjo L. C. and Montaldi J.,
Gauge Momenta as Casimir functions of nonholonomic systems.
Arch. Rat. Mech. Anal. **228** (2018), 563–602.
<https://doi.org/10.1007/s00205-017-1200-6>
17. García-Naranjo L. C. and Jiménez F.,
The geometric discretisation of the Suslov problem: a case study of consistency for nonholonomic integrators.
Disc. and Cont. Dyn. Syst. Series A **37** (2017), 4249–4275.
<https://doi.org/10.3934/dcds.2017182>
16. García-Naranjo L. C., Montaldi J. and Smolyanov O. G.,
Transformations of Feynman path integrals and generalized densities of Feynman pseudomeasures.
Doklady Math. **93**, (2016) 282–285.
<https://doi.org/10.1134/S1064562416030169>, <https://doi.org/10.1134/S106456241702017X>
15. García-Naranjo L. C., Marrero J. C., Pérez-Chavela E. and Rodríguez-Olmos M.,
Classification and stability of relative equilibria for the 2-body problem in the hyperbolic space of dimension 2.
J. of Differential Equations **260** (2016) 6375-6404.
<https://doi.org/10.1016/j.jde.2015.12.044>
14. Fassò F., García-Naranjo L. C. and Giacobbe A.,
Quasi-periodicity in relative quasi-periodic tori.
Nonlinearity **28** (2015), 4281–4301.
<https://doi.org/10.1088/0951-7715/28/11/4281>
13. Bravo-Doddoli A. and García-Naranjo L. C.,
The dynamics of an articulated n -trailer vehicle.
Reg. and Chaot. Dyn. **20** (2015), 497–517.
<https://doi.org/10.1134/S1560354715050019>
12. García-Naranjo L. C., Suárez-Serrato P. and Vera R.,
Poisson structures on smooth 4-manifolds.
Lett. in Math. Phys. **105** (2015), 1533–1550.
<https://doi.org/10.1007/s11005-015-0792-8>
11. Fedorov Y. N., García-Naranjo L. C. and Marrero J. C.,
Unimodularity and preservation of volumes in nonholonomic mechanics.
J. Nonlinear Sci. **25** (2015), 203–246.
<https://doi.org/10.1007/s00332-014-9227-4>
10. García-Naranjo L. C., Maciejewski A. J., Marrero J. C. and Przybylska M.,
The inhomogeneous Suslov problem.

- Phys. Lett. A* **378** (2014), 2389–2394.
<http://dx.doi.org/10.1016/j.physleta.2014.06.026>
9. García-Naranjo L. C. and Marrero J. C.,
Non-existence of an invariant measure for a homogeneous ellipsoid rolling on the plane.
Reg. and Chaot. Dyn. **18** (2013), 372–379.
<https://doi.org/10.1134/S1560354713040047>
8. García-Naranjo L. C. and Vankerschaver J.,
Nonholonomic LL systems on central extensions and the hydrodynamic Chaplygin sleigh with circulation.
J. Geom. Phys. **73** (2013), 56–69.
<http://dx.doi.org/10.1016/j.geomphys.2013.05.002>
7. Fedorov Y. N., García-Naranjo L. C. and Vankerschaver J.,
The motion of the 2D hydrodynamic Chaplygin sleigh in the presence of circulation.
Disc. and Cont. Dyn. Syst. Series A **33** (2013) no. 9, 4017–4040.
<https://doi.org/10.3934/dcds.2013.33.4017>
6. Balseiro, P. and García-Naranjo, L. C.,
Gauge transformations, twisted Poisson brackets and Hamiltonization of nonholonomic systems.
Arch. Rat. Mech. Anal. **205** (2012), no. 1, 267–310.
<https://doi.org/10.1007/s00205-012-0512-9>
5. Fedorov Y. N. and García-Naranjo, L. C.,
The hydrodynamic Chaplygin sleigh.
J. Phys. A: Math. Theor. **43** (2010) 434013 (18pp).
<https://doi.org/10.1088/1751-8113/43/43/434013>
4. García-Naranjo, L. C.,
Reduction of almost Poisson brackets and Hamiltonization of the Chaplygin sphere.
Disc. and Cont. Dyn. Syst. Series S, **3** (2010), no. 1, 37–60.
<https://doi.org/10.3934/dcdss.2010.3.37>
3. Hochgerner S. and García-Naranjo, L. C.,
 G -Chaplygin systems with internal symmetries, truncation, and an (almost) symplectic view of Chaplygin's ball.
J. Geom. Mech. **1** (2009), no.1, 35–53.
<https://doi.org/10.3934/jgm.2009.1.35>
2. García-Naranjo, L. C.,
Reduction of almost Poisson brackets for nonholonomic systems on Lie groups.
Reg. and Chaot. Dyn., **14** (2007), no. 4, 365–388.
<https://doi.org/10.1134/S1560354707040028>
1. Tartakovsky A. M., García-Naranjo L. C., and Tartakovsky D. M.,
Transient Flow in a Heterogeneous Vadose Zone with Uncertain Parameters.
Vadose Zone Journal, **3** (2004), 154–163.
<https://pubs.geoscienceworld.org/vzj/article-abstract/3/1/154/91621>

PREPRINTS

1. García-Naranjo L. C., Ortega R. and Ureña A. J.,
Invariant measures as obstructions to attractors in dynamical systems and their role in nonholonomic mechanics.
(2024) arXiv: 2404.14156
<https://arxiv.org/abs/2404.14156>
2. García-Naranjo L. C., Marrero J. C., Martín de Diego D. and Petit Valdés E. P.,
Almost-Poisson brackets for nonholonomic systems with gyroscopic terms and Hamiltonisation.
(2023) arXiv: 2309.11597
<https://arxiv.org/abs/2309.11597v1>

3. Constantineau K., García-Azpeitia C., García-Naranjo L. C. and Lessard J. P.,
Determination of stable branches of relative equilibria of the N -vortex problem on the sphere.
(2023) arXiv: 2309.04320
<https://arxiv.org/abs/2309.04320v1>
 4. Fedorov Y. N., García-Naranjo L. C. and Naranjo J. C.,
A shortcut to the Kovalevskaya curve via pencils of genus 3 curves.
(2016) arXiv:1606.08331.
<https://arxiv.org/abs/1606.08331>
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EDITORIAL WORK

- Editorial Board Member of:
 - *Journal of Nonlinear Science* (March 2023 - Present).
 - *Regular and Chaotic Dynamics* (December 2015 - Present).
 - *Geometric Mechanics* (January 2024 - Present).
 - *Journal of Geometric Mechanics* (March 2020 - January 2023).
 - Guest Editor for:
 - *Special Issue in memory of Hermann Flaschka in Physica D* (2024).
<https://www.sciencedirect.com/science/article/pii/S0167278924000496>
 - *Special Issue dedicated to James Montaldi in Journal of Geometric Mechanics* (2020).
<https://www.aims sciences.org/article/doi/10.3934/jgm.2020028>
 - Peer reviewer for: Archive for Rational Mechanics and Analysis, Journal of Nonlinear Science, Nonlinearity, Discrete and Continuous Dynamical Systems A, Regular and Chaotic Dynamics, SIGMA, Journal of Geometric Mechanics, Kinetic and Related Models, Applied Mathematics Letters, RACSAM, Proceedings A, Russian Journal of Nonlinear Science.
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CONFERENCE ORGANIZATION

- January 2023: *New Frontiers of Celestial Mechanics: theory and applications*. Padua, Italy. Member of the organizing committee.
- June 2022: *Geometry, Dynamics, Integrable Systems, GDIS*. Zlatibor, Serbia. Member of the scientific committee.
- November - December 2021: *Conference Regular & Chaotic Dynamics in memory of Alexey V. Borisov*. Steklov Institute, Moscow. Member of the programme committee.
- May 2020 – February 2022: *Geometry, Dynamics and Mechanics Seminar*. (A series of international biweekly online seminars). Member of organizing and scientific committee.
- December 2019: *XII Americas Conference on Differential Equations and nonlinear analysis*. CIMAT, Guanajuato, Mexico. Member of the scientific committee and organizer of the special session *Geometric Methods in Differential Equations*.
- June 2019: *Scientific Heritage of Sergey A. Chaplygin: nonholonomic mechanics, vortex structures and hydrodynamics*. I. N. Ulianov Chuvash State University, Cheboksary, Russia. Member of the scientific committee.
- August 2018: *VI Iberoamerican Meeting on Geometry, Mechanics and Control*, CIMAT, Guanajuato, Mexico (this was a Satellite Conference of ICM Rio de Janeiro 2018). Member of the scientific committee, organizing committee and leading organizer.

- February 2018: *Second National Meeting of Young Researchers in Mathematics*. UNAM, Mexico. Member of the organizing committee.
- January 2018: *Dynamics and integrability of nonholonomic and other non-Hamiltonian systems*, University of Padova, Italy. Member of the scientific and organizing committee.
- January 2017: *V Iberoamerican Meeting on Geometry, Mechanics and Control*, Tenerife, Spain. Member of the scientific committee.
- February 2014: *Workshop on Mechanics and Geometry*, UABJO, Oaxaca, Mexico. Member of the organizing committee.
- May 2012: *Workshop on Dynamical systems, Mechanics and Geometry*, ITAM, Mexico. Main organiser.

RESEARCH MINI-COURSES GIVEN

- 2016: *Geometry and dynamics of nonholonomic systems*. 10th ICMAT International Summer School on Geometry, Mechanics, and Control, La Cristalera, Spain.

SELECTED CONFERENCE INVITED TALKS

- 2024: *Stability in Hamiltonian Dynamics and Beyond*. Rome, Italy.
- 2023: *Regular and Chaotic Dynamics Conference*. Sochi, Russia. (Online talk).
- 2023: *New Frontiers of Celestial Mechanics: theory and applications*. Padua, Italy.
- 2022: *Theory, models and simulations in celestial mechanics*. Pisa, Italy.
- 2022: *Geometry, Dynamics, Integrable Systems*. Zlatibor, Serbia.
- 2021: *Conference Regular & Chaotic Dynamics in memory of Alexey V. Borisov*. Steklov Institute, Moscow, Russia (online talk).
- 2021: *Joint Meeting of the Spanish and Mexican Mathematical Societies*. Special Session on *Celestial Mechanics and Hamiltonian Systems*, Online conference organised by CIMAT, Mexico.
- 2021: *10th Workshop on Dynamical Systems and Geometry*. Online conference organised by CIMAT, Universidad de Sonora and UNAM, Mexico.
- 2020: *Celestial Mechanics and Beyond*. Conference in honor of Donald Saari's 80th birthday. Puebla, Mexico.
- 2019: *SciCADE 2019*. Special session on *Discrete integrable systems and numerical methods*. University of Innsbruck, Innsbruck, Austria.
- 2019: *Scientific heritage of Sergei Chaplygin. Nonholonomic Mechanics, Vortex Structures and Hydrodynamics*. Chuvash State University, Cheboksary, Russia.
- 2018: *12th AIMS Conference on Dynamical Systems and Differential Equations*, Special Session on *Geometry and Dynamics*. Taipei, Taiwan.
- 2018: *Geometry, Dynamics, Integrable Systems*. Moscow Institute of Physics and Technology, Russia.
- 2016: *Nonholonomic and robotics day*. University of Padua, Italy.
- 2016: *International Conference Geometry, Dynamics, Integrable Systems*. Izhevsk, Russia.
- 2015: *Joint Meeting Brazil-Spain in Mathematics*. Special Session on *Geometry and Mechanics*, Fortaleza, Brazil.
- 2015: *Integrability in Mechanics and Geometry*. ICERM, Brown University, USA.
- 2015: *International GMC Summer School on Symplectic Geometry, Classical Mechanics and Interactions with Spectral Theory*. La Cristalera, Spain.

- 2014: *10th AIMS Conference on Dynamical Systems and Differential Equations*, Special Session on *Geometric Mechanics*. Madrid, Spain.
 - 2014: *35th Anniversary of the Program in Applied Mathematics*. University of Arizona, USA.
 - 2014: *Iberoamerican Meeting on Geometry, Mechanics and Control*. IMPA, Brazil.
 - 2013: *International Conference Geometry, Dynamics, Integrable Systems*. Izhevsk, Russia.
 - 2012: *Iberoamerican Meeting on Geometry, Mechanics and Control*. Salamanca, Spain.
 - 2011: *Applied Dynamics and Geometric Mechanics*. Oberwolfach, Germany.
 - 2010: *International Workshop on Differential Geometric Methods in Theoretical Physics*. Levico Terme, Italy.
 - 2010: *8th AIMS Conference on Dynamical Systems and Differential Equations*, Special Session on *Geometric Mechanics*. Dresden Technical University, Germany.
 - 2010: *International Young Researchers Workshop on Geometry, Mechanics, and Control*. University of Ghent, Belgium.
 - 2008: *7th AIMS Conference on Dynamical Systems and Differential Equations*, Special Session on *Nonholonomic Constraints in Mechanics and Optimal Control Theory*. University of Texas at Arlington, USA.
 - 2007: *Workshop on Nonholonomic Dynamics and Integrability*. BIRS, Banff, Canada.
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TEACHING EXPERIENCE

- *Master and PhD courses*: Lie groups and symmetry, Geometry and dynamics of nonholonomic systems, Symplectic mechanics, Dynamical systems, University of Padua, 2021–2023. Dynamical systems and Mathematics, Differential equations, Analytical mechanics, Advanced methods in analytical mechanics, Symmetry and geometry in analytical mechanics, Hamiltonian systems with symmetry, UNAM, Mexico 2013–2020.
 - *Undergraduate teaching*: Linear Algebra and Geometry, University of Padua, 2021–2023. College Algebra, Trigonometry, Calculus I, Calculus II, Vector Calculus, University of Arizona, USA 2001–2007. Vector Calculus, Dynamical Systems, ITAM, Mexico, 2012.
 - *Teaching assistant* for a number of postgraduate and undergraduate courses at UNAM, Mexico, University of Arizona, USA, and EPFL, Switzerland, 1998–2007.
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MENTORSHIP

- *PhD thesis supervisor* of Mariana Costa Villegas, Mathematics, University of Padua. Expected graduation in 2024 or 2025.
- *PhD thesis cosupervisor* of Eugenio P. Petit Valdés (joint with Nicola Sansonetto), Mathematics, University of Verona-Trento. Graduation July 2023.
- *Master's thesis supervisor* of Daniele Giannetto, Mathematics, University of Padua. Expected graduation July 2024.
- *Master's thesis supervisor* of Enzo Rigato, Mathematics, University of Padua. Expected graduation September 2024.
- *Master's thesis supervisor* of Gildas Djanga, Mathematics, University of Douala, Cameroon. Expected graduation in 2023.
- *Bachelor's thesis supervisor* of Elena Menon, Mathematics, University of Padua. Graduation July 2022.
- *Master's thesis supervisor* of Eugenio P. Petit Valdés, Mathematics, UNAM. Graduation March 2019.
- *Master's thesis supervisor* of Alejandro Bravo, Mathematics, UNAM. Graduation September 2016.
- *Bachelor's thesis supervisor* of David Padilla, Mathematics, UNAM. Graduation with honours August 2015.
- *Bachelor's thesis supervisor* of Homar Rivera, Physics, UNAM. Graduation with honours May 2015.

LANGUAGES

- Fluent in English, French, Italian and Spanish (mother tongue). Intermediate in German. Beginner in Portuguese.
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