Francisco Martín

Curriculum Vitae

Departamento de Geometría y Topología
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Education

[1992–1996] **Post-graduate studies in Mathematics**, *Department of Geometry and Topology*, University of Granada, Granada, Spain.
PhD thesis: "*Complete non-orientable minimal surfaces*", under the supervision of Professor Francisco J. López.

[1987–1992] **Bachelor in Mathematics**, *Faculty of Sciences*, University of Granada, Granada, Spain.

Research Interests

- Differential Geometry
- Geometric Analysis
- Minimal surfaces
- Geometric PDE's
- Geometric Flows

Positions

[2012–] **Full Professor**, *Dept. Geometry and Topology*, University of Granada, Spain.
[2001–2012] **Associate Professor**, *Dept. Geometry and Topology*, University of Granada, Spain.
[2000–2001] **Visiting Lecturer**, *Department of Mathematics*, University of Pavia, Italy.
[1992–1999] **Assistant Professor**, *Dept. Geometry and Topology*, University of Granada, Spain.

Ph. D. Students

exp. 2027 **Javier Hervás Aniorte**, *Dept. Geometry and Topology*, University of Granada, Spain.
2023 **José G. Torres Santaella**, *Dept. Mathematics*, PUC, Santiago, Chile.
2019 **Eddygledson Souza Gama**, *Dept. Mathematics*, UFC, Fortaleza, Brasil.
2016 **Jesús Pérez-García**, *Dept. Geometry and Topology*, University of Granada, Spain.
2008 **Antonio Alarcón**, *Dept. Geometry and Topology*, University of Granada, Spain.
2002 **Santiago Morales**, *Dept. Geometry and Topology*, University of Granada, Spain.

Accepted and Published Papers

- **[49]** Generating Shrinkers by Mean Curvature Flow (with D. Hoffman and B. White). Mathematische Annalen (to appear.) Preprint arXiv:2502.20340.

- **[48]** Complete translating solitons in Lorentzian Geometry (with L. Ferrer and M. Sánchez). Rev. Real Acad. Cienc. Exactas Fis. Nat. Ser. A-Mat. 120, 13 (2026). https://doi.org/10.1007/s13398-025-01808-y
- **[47]** Finite entropy translating solitons in slabs (with E. S. Gama and N. M. Moller). American J. of Math. (to appear). Preprint arXiv:2209.01640.
- **[46]** Classification of semigraphical translators (with M. Saez, R. Tsiamis and B. White). J. Reine Angew. Math. (to appear). Preprint arXiv:2411.16889.
- **[45]** Translating annuli for Mean Curvature Flow (with D. Hoffman and B. White). Advances in Mathematics, Volume 455, 2024, 109875.
- **[44]** Annuloids and Δ-wings (with D. Hoffman and B.White). Advanced Nonlinear Studies, vol. 24, no. 1, 2024, pp. 74-96. https://doi.org/10.1515/ans-2023-0111 .
- **[43]** Morse-Radó theory for minimal surfaces (with D. Hoffman and B.White). Journal of the London Math. Soc., Volume108, Issue 4 October 2023, pp.1669-1700 .
- **[42]** Nguyen's Tridents and the Classification of Semigraphical Translators for Mean Curvature Flow (with D. Hoffman and B. White). J. Reine Angew. Math., vol. 2022, no. 786, 2022, pp. 79-105.
- **[41]** Scherk-like Translators for Mean Curvature Flow. (with D. Hoffman and B. White). Journal of Differential Geometry, Volume 122 (3), 421-465, 2022.
- **[40]** The Jenkins-Serrin problem for translating horizontal graphs in $M \times \mathbb{R}$ (with E. S. Gama, E. Heinonen and J. Lira.) Revista Matemática Iberoamericana, Volume 37, Issue 3, 2021, pp. 1083–1114. DOI: 10.4171/rmi/1221
- **[39]** Translating solitons of the mean curvature flow asymptotic to hyperplanes in $\mathbb{R}^{n+1}$ (with Eddygledson S. Gama). International Mathematics Research Notices, Volume 2020, Issue 24, December 2020, Pages 10114–10153. DOI: 10.1093/imrn/rny278
- **[38]** Graphical translators for the mean curvature flow (with D. Hoffman, T. Ilmanen and B. White). Calculus of Variations and PDE's, vol. 58, (2019), art. 117.
- **[37]** Properly embedded minimal annuli in $\mathbb{H}^2 \times \mathbb{R}$ (with L. Ferrer, R. Mazzeo and M. Rodríguez). Math. Ann., Volume 375, Issue 1–2, (2019), pp 541–594..
- **[36]** Translating solitons in Riemannian products (with J. H. de Lira). Journal of Differential Equations, Volume 266, Issue 12, 5 June 2019, Pages 7780–7812.
- **[35]** A characterization the of the grim reaper cylinder (with J. Perez-Garcia, A. Savas-Halilaj and K. Smoczyk). Journal für reine und angewandte Mathematik, Volume 2019, Issue 746 (2019) 209–234.
- **[34]** On the topology of translating solitons of the mean curvature flow (with A. Savas-Halilaj and K. Smoczyk). Calculus of Variations and PDEs, Volume 54, Issue 3 (2015) 2853–2882.
- **[33]** A construction of a complete bounded null curve in $\mathbb{C}^3$ (with L. Ferrer, F. Martin, M. Umehara and K. Yamada) Kodai Math. J. 2014 (vol 37) pages 59-96.
- **[32]** Properly embedded, area-minimizing surfaces in hyperbolic 3-space (with Brian White). Journal of Differential Geometry 97 (3) (2014), 515-544.
- **[31]** Minimal surfaces with positive genus and finite total curvature in $\mathbb{H}^2 \times \mathbb{R}$ (with Rafe Mazzeo and Magdalena Rodríguez). Geometry and Topology 18 (2014) 141-177. arXiv:1208.5253.
- **[30]** Non simply connected minimal planar domains in $\mathbb{H}^2 \times \mathbb{R}$ (with Magdalena Rodriguez). Transactions of the A.M.S. 365 (2013), 6167-6183.
- **[29]** Existence of proper minimal surfaces of arbitrary topological type (with L. Ferrer y W. H. Meeks III). Advances in Mathematics Volume 231, Issue 1, (2012) 378–413. http://arxiv.org/abs/0903.4194.

- **[28]** Flat surfaces in hyperbolic 3-space whose hyperbolic Gauss maps are bounded (with M. Umehara and K. Yamada). Rev. Mat. Iberoam. Volume 30, Issue 1, 2014, pp. 309-316 DOI: 10.4171/RMI/779.
- **[27]** Calabi-Yau domains in three manifolds (with W. H. Meeks III). American J. of Math. Volume 134, Number 5 (2012), 1329-1344.
- **[26]** Complete bounded holomorphic curves immersed in $\mathbb{C}^2$ with arbitrary genus (with M.Umehara and K. Yamada). Proc. A.M.S. 137 (2009), 3437-3450.
- **[25]** Complete bounded null curves immersed in $\mathbb{C}^3$ and $SL(2,\mathbb{C})$(with M. Umehara and K. Yamada). Calculus of Variations and P.D.E.'s (2009) 36:119-139 DOI10.1007/s00526-009-0226-5.
- **[24]** Density theorems for complete minimal surfaces in $\mathbb{R}^3$ (with A. Alarcon and L. Ferrer). GAFA. 18 (2008), 1-49.
- **[23]** A Jordan curve spanned by a complete minimal surface (with N. Nadirashvili). Arch. Ration. Mech. Anal. 184(2) (2007), 285-301.
- **[22]** Bounded domains which are universal for minimal surfaces (with W. H. Meeks III and N. Nadirashvili). American J. of Math. 129(2) (2007), 455-461.
- **[21]** A uniqueness theorem for the singly periodic genus-one helicoid (with A. Alarcón and L.Ferrer). Trans. A.M.S. 359(6) (2007), 2819-2829.
- **[20]** The embedded singly periodic Scherk-Costa surfaces (with V. Ramos-Batista). Math. Ann. 336(1) (2006), 155-189.
- **[19]** Complete proper minimal surfaces in convex bodies of $\mathbb{R}^3$ (II) (with S. Morales). Comm. Math. Helv. 81(3) (2006), 699-725.
- **[18]** Complete nonorientable minimal surfaces in a ball (with F.J. López and Santiago Morales). Trans. Amer. Math. Soc. 358 (2006), 3807-3820.
- **[17]** Minimal surfaces with helicoidal ends (with L. Ferrer). Math. Zeit. 250(4) (2005), 807-839.
- **[16]** Complete proper minimal surfaces in convex bodies $\mathbb{R}^3$(with S. Morales). Duke Math. J. 128(3) (2005), 559-593.
- **[15]** On the asymptotic behavior of a complete bounded minimal surface in $\mathbb{R}^3$ (with S. Morales). Trans. A.M.S. 356(10) (2004), 3985-3994.
- **[14]** Properly embedded minimal disks bounded by non compact polygonal lines (with L. Ferrer). Pacific J. Math., 214(1) (2004), 55-88.
- **[13]** Adding handles to Nadirashvili's surfaces (with F. J. López y S. Morales). Journal of Differential Geometry 60 (2002), no. 1, 155-175.
- **[12]** Minimal surfaces in a wedge of a slab (with F. J. López). Communications in Analysis and Geometry, Vol. 9, n. 4 (2001), 683-723.
- **[11]** A complete bounded minimal cylinder in $\mathbb{R}^3$ (with S. Morales). Michigan Math. J. Vol. 47 (2000), n. 3, 499-514.
- **[10]** Properly Embedded Minimal Surfaces with Three Ends (with M. Weber). Duke Math. J. Volume 107, Number 3, (2001) 533-560.
- **[9]** A note on the uniqueness of the periodic Callahan-Hoffman-Meeks surfaces. Geometriae Dedicata 86 (2001), no. 1-3, 185-190.
- **[8]** A note on the Gauss map of a complete nonorientable minimal surface (with F.J. López). Pacific J. Math., Vol. 194, No. 1, (2000) 129-135.
- **[7]** Uniqueness of properly embedded minimal surfaces bounded by straight lines (with F.J. López). J. Australian Math. Soc. Series A 69 (2000), no. 3, 362-402.
- **[6]** A survey on complete minimal surfaces in $\mathbb{R}^3$. Publicacions Matematiques, Vol. 43, No. 2, (1999) 341-449. (with F J López).

- **[5]** Complete minimal surfaces derived from Chen-Gackstätter genus two example. Pacific J. Math., Vol. 184, No. 2, (1998) 311-332. (with F.J. Lopez and D. Rodríguez).
- **[4]** A new approach to the construction of complete minimal surfaces derived from the genus two Chen-Gackstatter example. Illinois J. Math., Vol. 41, No. 2, (1997) 171-192; (with D. Rodríguez).
- **[3]** A characterization of the periodic Callahan-Hoffman-Meeks surfaces in terms of their symmetries. (with D. Rodríguez) Duke Math. J., Vol. 89, No. 3, (1997) 445-463.
- **[2]** Complete nonorientable minimal surfaces with the highest symmetry group. American J. Math., Vol. 119, No. 1, (1997) 55-81; (with F. J. López).
- **[1]** Complete nonorientable minimal surfaces and symmetries. Duke Math. J., Vol. 79, No. 3, (1995) 667-686; (with F. J. López).

Preprints

- **[3]** Minimal surfaces with rapid area growth (with Tobias H. Colding and William P. Minicozzi II). Preprint arXiv:2605.28504.
- **[2]** Expanders for Mean Curvature Flow and Counterexamples to Ilmanen's Genus-Reduction Conjecture (with D. Hoffman and B. White). Preprint arXiv:2605.09657.
- **[1]** Uniqueness of tangent planes and (non-)removable singularities at infinity for collapsed translators (with E. S. Gama and N. M. Moller). Preprint arXiv:2509.11473.

Proceedings

- Notes on Translating Solitons for Mean Curvature Flow (with D. Hoffman, T. Ilmanen, and B. White). T. Hoffmann et al. (eds.), Minimal Surfaces: Integrable Systems and Visualisation, Springer Proceedings in Mathematics & Statistics 349, Springer Nature, Switzerland AG, 2021. DOI: 10.1007/978-3-030-68541-6 9
- Families of Minimal Surfaces in $\mathbb{H}^2 \times \mathbb{R}$ Foliated by Arcs and Their Jacobi Fields (with L. Ferrer, R. Mazzeo, and M. Rodríguez). T. Hoffmann et al. (eds.), Minimal Surfaces: Integrable Systems and Visualisation, Springer Proceedings in Mathematics & Statistics 349, Springer Nature, Switzerland AG, 2021. DOI: 10.1007/978-3-030-68541-6 5
- An extension of Krust's theorem for minimal surfaces (with Cristobal Reyes). (Spanish) Florentino García Santos: in memoriam, 115–117, Editorial Universidad de Granada, Granada, 2011.
- Density theorems and applications. Proceedings of the workshop "Progress in surface theory". Oberwolfach April 29th - May 5th, 2007.
- On the singly periodic genus one helicoid (with A. Alarcón and L. Ferrer). Differ. Geom. Dyn. Syst. 8 (2006), 1–7 (electronic).
- Complete nonorientable minimal surfaces in $\mathbb{R}^3$. Global theory of minimal surfaces, 371–380, Clay Math. Proc., 2, Amer. Math. Soc., Providence, RI, 2005.
- Construction of a complete bounded minimal annulus in $\mathbb{R}^3$ (with S. Morales). (Spanish) Proceedings of the Meeting of Andalusian Mathematicians, Vol. II (Spanish) (Sevilla, 2000), 649–653, Colecc. Abierta, 52, Univ. Sevilla Secr. Publ., Seville, 2001.
- Minimal discs bounded by straight lines (with L. Ferrer). Differential geometry, Valencia, 2001, 157–166, World Sci. Publ., River Edge, NJ, 2002
- Huge singly periodic minimal surfaces in $\mathbb{R}^3$ and symmetries (with Domingo Rodríguez). Proceedings of the 1st International Meeting on Geometry and Topology (Braga, 1997), 139–147 (electronic), Cent. Mat. Univ. Minho, Braga, 1998.

- Complete nonorientable minimal surfaces (with F.J. López). Geometry and topology of submanifolds, VIII (Brussels, 1995/Nordfjordeid, 1995), 231–235, World Sci. Publ., River Edge, NJ, 1996

Recent invited talks

- **[2026]** Colloquium of Mathematics. Monash University, Melbourne, Australia. July 30, 2026
- **[2026]** Analysis Seminar. La Sapienza Università di Roma, Italy. January 16, 2026
- **[2024]** SLMath program New Frontiers in Curvature: Flows, General Relativity, Minimal Submanifolds, and Symmetry. August to December, 2024
- **[2023]** Geometry workshop. Department of Mathematics. DTU, Copenhagen, Denmark. June 30, 2023
- **[2023]** Geometry Seminar. Department of Mathematics. Copenhagen University, Copenhagen, Denmark. June 20, 2023
- **[2022]** 15th Panhellenic Geometry Conference. Ioannina, Greece. September 29 to October 1, 2022.
- **[2022]** Workshop on Surface Theory –UY60– March 4–7, 2022. Zoom & At Business Center Yokohama Station West Gate, Japan.
- **[2021]** Geometric and Topology Seminar (on-line), Einstein Institute of Mathematics, Hebrew University of Jerusalem, Jerusalem, Israel.
- **[2019]** Geometric Analysis and Partial Differential Equations Seminar, Department of Pure Mathematics and Mathematical Statistics, Cambridge University, Cambridge, U.K.
- **[2018]** Minimal Surfaces and Mean Curvature Flow. A Conference in Honor of Brian White. Stanford University, USA.
- **[2017]** IMPA – 31^{st} Colóquio Brasileiro de Matemática, Rio Janeiro, Brazil.
- **[2016]** Analysis Seminar. Department of Mathematics. E.T.H., Zürich, Switzerland.
- **[2015]** Special Geometry Seminar. Department of Mathematics. Stanford University, USA.
- **[2015]** Seminar on Differential Geometry and Analysis. Institut für Analysis und Numerik Otto-von-Guericke-Universität Magdeburg, Germany.
- **[2015]** Seminar in Pure Mathematics. Department of Mathematics. University of Leicester, UK.
- **[2015]** Bay Area Differential Geometry Seminar. Department of Mathematics. Stanford University, USA.
- **[2014]** Oberseminar Differentialgeometrie. Institut für Differentialgeometrie, Leibniz Universität Hannover, Germany.
- **[2014]** Seminar on Differential Geometry. Tokyo Institute of Technology, Japan.
- **[2013]** "Topics in Geometric Analysis" at the Free University Berlin, Germany.
- **[2012]** Seminar on Differential Geometry and Analysis. Institut für Differentialgeometrie, Leibniz Universität Hannover, Germany.
- **[2011]** International conference on surface theory. Universidad de Sevilla, Spain.
- **[2009]** Research In Pairs: Surface Theory. Benediktbeuern, Germany
- **[2007]** Progress In Surface Theory. Oberwolfach, Germany.

Recent Grants

- **[2025–2028]** Ref: PID2024-156031NB-I00 .
  Funded by MICIU, Spain.
  Title: ?New Challenges in Differential Geometry: Flows Lorentz-Finsler Geometry and Applications?.
  Heads: Francisco Martín and Miguel Sánchez.
- **[2021–2025]** Ref: PID2020-116126GB-I00.
  Funded by MICINN, Spain.
  Title: "Semi-Riemannian Geometry and Geometric Flows in Mathematical Physics".
  Heads: Miguel Sánchez and Francisco Martín.
- **[2021–2023]** Ref: P20-01391.
  Funded by the Regional Government of Andalusia and ERDEF (UE).
  Title: "Differential Equations in Manifolds, Mathematical Physics and Applications".
  Head: Francisco Martín.

Professional Activities

- **[11]** Co-organizer of the BIRS-IMAG workshop *"Minimal Surfaces in Symmetric Spaces"* at the Institute of Mathematics of Granada (IMAG) from May 21, 2023 to May 26, 2023
- **[10]** President of the panel of Mathematics of the Spanish Research Agency (AEI), 2018 – 2023
- **[9]** Co-organizer of the workshop *"Workshop on minimal surfaces and related topics"*, January 9-12, 2018. IE-Math Granada. Granada, Spain.
- **[8]** Co-organizer of the workshop *"Third Japanese-Spanish workshop on Differential Geometry"*. September 18-22, 2017. ICMAT, Madrid, Spain.
- **[7]** Co-organizer of the *m:iv spring 2017 workshop*, March 27-29, 2017, University College of Cork, Ireland.
- **[6]** Co-organizer of the workshop *"Geometric Flows"*, April 5-11, 2015. IE-Math Granada. Granada, Spain.
- **[5]** Co-organizer of the workshop *"Second Japanese-Spanish workshop on Differential Geometry"*. February 5 to 10, 2014. TOKYO INSTITUTE OF TECHNOLOGY. Tokyo, Japan,
- **[4]** Coordinator of the special trimester "Conformal Geometry and Geometric Partial Differential Equations". May to July 2013. CRM, Barcelona, Spain.
- **[3]** Co-organizer of the workshop *"Minimal submanifolds and Related Topics"*, Fakultät für Mathematik und Physik, Leibniz Universität Hannover, August 2013. Hannover-Germany.
- **[2]** Co-organizer of the workshop *"Variational Problems and Geometric P.D.E.' s"*, June 2013. IE-Math Granada. Granada, Spain.
- **[1]** Referee for the following journals: *Annals of Mathematics, Inventiones mathematicae, Journal of Differential Geometry, Duke Mathematical Journal, American Journal of Mathematics, Advances in Mathematics, G.A.F.A, Journal für die reine und angewandte Mathematik (Crelle), Mathematische Annalen, Mathematische Zeitschrift, Manuscripta Mathematica, Calculus of Variations and Partial Differential Equations, Transactions of the A.M.S., Proceedings of the A.M.S., Journal of Geometric Analysis, Pacific Journal of Mathematics, Differential Geometry and Applications, International Mathematics Research Notices, Proc. A Royal Soc. Edinburgh, Comm. Math. Helvetici, Journal of Mathematical Physics, J. Math. Anal. App., Comm. Anal. Geom.*