Curriculum Vitae

Javier Gómez Serrano

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Personal Data

Department of Mathematics
Brown University
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Providence, RI 02912, USA

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Academic Background

5-year degree February 2009
Universidad Politécnica de Cataluña, Barcelona.
Mathematics. Ranked 3rd in class.

5-year degree October 2009
Universidad Politécnica de Cataluña, Barcelona.
Telecommunication. Ranked 1st in class. Ranked 3rd in Spain (36 universities).
Final Degree Project done in collaboration with EPFL (Lausanne, Switzerland):
Mean field dynamics of the bounded confidence model
Grade: 6.0/6.0 (ECTS: A), 10.0/10.0 (Honors)
Advisor: Prof. Jean-Yves Le Boudec.

Engineering October 2009
Centro de Formación Interdisciplinaria Superior (CFIS), Barcelona.
Multidisciplinar Engineer.

Master October 2010
Universidad Autónoma de Madrid, Madrid.
Mathematics. Ranked 1st in class.
Master Thesis: *Boundary layer theory and Prandtl's equation*
Grade: 10.0/10.0. Advisor: Prof. Diego Córdoba.

PhD July 2013
Universidad Autónoma de Madrid, Madrid.
Mathematics. Best dissertation of the year award.
Analytical and Computer-assisted proofs in incompressible fluids
Advisor: Prof. Diego Córdoba.

Professional Interests

Partial Differential Equations in Fluid Mechanics, Computer-assisted proofs,
Spectral geometry, Analysis

Appointments

- Associate Professor, Brown University, 2022-currently.
- CRM Simons Professor, CRM Montreal, Fall 2024.
- Full Professor, Universitat de Barcelona, 2022.
- Visiting Professor, Brown University, 2020-2022.
- Investigador Distinguido, Universitat de Barcelona, 2020-2022.
- Assistant Professor, Princeton University, 2016-2020.
- Instructor, Princeton University, 2013-2016.
- ERC Predoc, CSIC, Madrid, 2009-2013.
- Software Engineering Intern, Google Dublin, 2008.
- Becario de Penúltimo Curso, CSIC, Madrid, 2007.
- High School Teacher (Programming in C++), Aula Escola Europea, Barcelona, 2007.

Publications

Research papers

1. "Non-radial implosion for compressible Euler and Navier-Stokes in $\mathbb{T}^3$ and $\mathbb{R}^3$" (G. Cao-Labora, J. Shi and G. Staffilani), *arXiv preprint:2310.05325*. Submitted.

2. "Desingularization of small moving corners for the Muskat equation" (with E. García-Juárez, S. V. Haziot and B. Pausader), *arXiv preprint:2305.05046*. Submitted.

3. "Quasiperiodic solutions of the generalized SQG equation" (with A. Ionescu and J. Park), *arXiv preprint:2303.03992*. Submitted.

4. "Smooth self-similar imploding profiles to 3D compressible Euler" (with T. Buckmaster and G. Cao-Labora), *Quarterly of Applied Mathematics*, 81, 517-532 (2023).

5. "Smooth imploding solutions for 3D compressible fluid" (with T. Buckmaster and G. Cao-Labora), *arXiv preprint:2208.09445*. Submitted.

6. Self-similar spirals for the generalized surface quasi-geostrophic equations, (with C. García), *Journal of the European Mathematical Society*, to appear.

7. "Highest Cusped Waves for the Burgers-Hilbert equation" (with J. Dahne), *Arch. Ration. Mech. Anal.*, 247, Article number: 74 (2023).

8. "Self-similar blow-up profile for the Boussinesq equations via a physics-informed neural network" (with T. Buckmaster, C.Y. Lai and Y. Wang), *Physical Review Letters*, 130, no. 24, 244002 (2023).
   Featured in Quanta Magazine, Quanta Podcast, El País.

9. "Existence of non-trivial non-concentrated compactly supported stationary solutions of the 2D Euler equation with finite energy" (with J. Park and J. Shi), *Memoirs of the AMS*. To appear.

10. "Self-similar solutions for the Muskat equation" (with E. García-Juárez, H. Q. Nguyen and B. Pausader), *Advances in Mathematics*, 399, 108294 (2022).

11. "A counterexample to Payne's nodal line conjecture with few holes" (with J. Dahne and K. Hou), *Commun. Nonlinear Sci. Numer. Simul.*, 103, 105957 (2021). Special Issue "Computer Assisted Proofs in Dynamical Systems".

12. "Remarks on stationary and uniformly-rotating vortex sheets: Flexibility results" (with J. Park, J. Shi and Y. Yao), *Philosophical Transactions of the Royal Society A.* 380, no. 2226, 20210045 (2022).

13. "Remarks on stationary and uniformly-rotating vortex sheets: Rigidity results" (with J. Park, J. Shi and Y. Yao), *Communications in Mathematical Physics*, 386, 1845–1879 (2021).

14. "Any three eigenvalues do not determine a triangle" (with G. Orriols), *Journal of Differential Equations*, 275, 920-938 (2021).

15. "Symmetry in stationary and uniformly-rotating solutions of active scalar equations" (with J. Park, J. Shi and Y. Yao), *Duke Mathematical Journal*, 170, no. 13, 2957-3038 (2021).

16. "Convexity of cusped Whitham waves" (with A. Enciso and B. Vergara), *arXiv preprint:1810.10935*. Submitted.

17. "Computer-Assisted Proofs in PDE: a survey", *SeMA Journal*, 76, no. 3, 459-484 (2019).

18. "On the existence of stationary patches", *Advances in Mathematics*, 343, 110-140 (2019).

19. "Spectral determination of semi-regular polygons" (with A. Enciso), *Journal of Differential Geometry*, 122 (3), 399-419 (2022).

20. "Global solutions for the generalized SQG patch equation" (with D. Córdoba & A. Ionescu), *Arch. Ration. Mech. Anal.*, 233, no. 3, 1211-1251 (2019).

21. "Uniformly rotating smooth solutions for the incompressible 2D Euler equations" (with A. Castro & D. Córdoba), *Arch. Ration. Mech. Anal.*, 231, no. 2, 719-785 (2019).

22. "Global smooth solutions for the inviscid SQG equation" (with A. Castro & D. Córdoba), *Memoirs of the AMS*, 266, no. 1292, 89 pp (2020).

23. "A note on stability shifting for the Muskat problem II: stable to unstable and back" (with D. Córdoba & A. Zlatoš), *Analysis & PDE*, 10, no. 2, 367-378 (2017).

24. "Uniformly rotating analytic global patch solutions for active scalars" (with A. Castro and D. Córdoba), *Annals of PDE*, 2, no. 1, 1-34 (2016).

25. "Splash singularities for the free boundary Navier-Stokes equations" (with A. Castro, D. Córdoba, C. Fefferman and F. Gancedo), *Annals of PDE*, 5, no. 1, Art. 12, 1-117 (2019).

26. "A note on stability shifting for the Muskat problem" (with D. Córdoba & A. Zlatoš), *Philosophical Transactions of the Royal Society A*, 373, 20140278 (2015).

27. "Existence and regularity of rotating global solutions for the generalized surface quasi-geostrophic equations" (with A. Castro & D. Córdoba), *Duke Mathematical Journal*, 165, no. 5, 935-984 (2016).

28. "Structural stability for the splash singularities of the water waves problem" (with A. Castro, D. Córdoba, C. Fefferman & F. Gancedo), *Discrete and Continuous Dynamical Systems - A*, 34, no. 12, 4997-5043 (2014).

29. "Remarks on the geometric properties of the SQG sharp fronts and α-patches" (with A. Castro, D. Córdoba & A. Martín Zamora), *Discrete and Continuous Dynamical Systems - A*, 34, no. 12, 5045-5059 (2014).

30. "On turning waves for the inhomogeneous Muskat problem: a computer-assisted proof" (with R. Granero-Belinchón), *Nonlinearity*, vol. 27, n. 6, 1471-1498, (2014). Featured article.

31. "Finite time singularities for water waves with surface tension" (with A. Castro, D. Córdoba, C. Fefferman & F. Gancedo), *Journal of Mathematical Physics*, 53, 115622 (2012). Special issue "Incompressible Fluids, Turbulence and Mixing".

32. "Finite time singularities for the free boundary incompressible Euler equations" (with A. Castro, D. Córdoba, C. Fefferman & F. Gancedo), *Annals of Mathematics*, 178, no. 3, 1061-1134 (2013).

33. "Splash Singularity for Water Waves" (with A. Castro, D. Córdoba, C. Fefferman & F. Gancedo), *Proceedings of the National Academy of Sciences (PNAS)* 109, num. 3, 733-738, (2012).

34. "The Bounded Confidence Model Of Opinion Dynamics" (with J.-Y. Le Boudec & C. Graham), *Mathematical Models and Methods in Applied Sciences (M3AS)* 22, num. 2, 1150007-1–1150007-46, (2012).

35. "Comment on Mixing Beliefs Among Interacting Agents" (with J.-Y. Le Boudec), *Advances in Complex Systems* Vol. 15, No. 7, 1250028-1–1250028-7, (2012).

Other publications (educational)

1. "Combinatorial Games: Following John H. Conway (in Spanish)" (with L. Hernández-Corbato), in *Matemáticas para estimular el talento III*, pp. 223-245. Sociedad Andaluza de Educación Matemática THALES, Granada. Pérez, A.; Sánchez, M. (Eds.), ISBN: 978-84-15641-06-03, (2014).

2. "XXVII Olimpiada Iberoamericana de Matemáticas" (with M. Castrillón), *La Gaceta de la RSME.*, Vol. 15 (4), 772-775, (2012).

3. "XXVI Olimpiada Iberoamericana de Matemáticas" (with M. Castrillón), *La Gaceta de la RSME.*, Vol. 14 (4), 798-801, (2011).

Selected Prizes and Honors

- CRM Aisenstadt Chair, 2024.
- Antonio Ambrosetti Medal, 2023.
- Antonio Valle Prize. Best Spanish Applied Mathematician under 33, 2018.
- FBBVA Vicent Caselles Prize. Best Spanish Mathematicians under 32, 2017.
- Junior Faculty Teaching Award, Princeton, 2015.
- Best PhD dissertation award in Mathematics in the year 2012-2013 at UAM, 2013.
- Third best Record Nationwide in Telecommunication Engineering (National Prize - 36 Universities), 2013.
- Certamen Universitario Arquímedes (Introduction to Research for Undergraduates), 2009. Science Category, 2nd Prize for the paper *The bounded confidence model in opinion dynamics*.
- International Mathematics Competition, 2nd Prize (2005), 3rd Prize (2006).
- Iberoamerican Mathematical Olympiad for University Students, Silver Medal (2004), Silver Medal (2007).
- Top 250 Worldwide at Google Code Jam 2005.
- ACM ICPC SouthWestern Europe Regional Contest, 7th Place (2004), 9th Place (2005), 4th Place (2006), 8th Place (2007), 3rd Place (2008).
- Participant at the International Mathematical Olympiad, (Tokio, Japan), 2003.
- Spanish National Olympiads:
  - Mathematics: Silver Medal (2002), Gold Medal (2003).
  - Physics: Bronze Medal (2003).
  - Chemistry: Bronze Medal (2002), Gold Medal (2003).
- Mediterranean Mathematics Competition, Honorable Mention (2002). Bronze Medal (2003).
- Olimpiada de Mayo (Iberoamerican level), Bronze Medal (2000).

Research Grants

- co-PI: NSF FRG Grant DMS-2245017 ($1,337,169), 2023-2026. Joint PI with T. Buckmaster, A. Ionescu, H. Jia, and C.Y. Lai.
- PI: NSF Grant DMS-2247537 ($226,333), 2023-2026.
- PI: ERC Starting Grant ERC-StG-CAPA-852741 (1,485,000 €), 2020-2025.
- co-PI: Generación de Conocimiento 2021 (PID2021-125021NA-I00). Spanish Science and Innovation Ministry. (205,700 €), 2022-2025. Joint PI with X. Ros-Otón.

- PI: NSF CAREER Grant (*declined*).
- PI: NSF Grant DMS-1763356 ($120,000), 2018-2021.
- PI: Simons Collaboration Grant ($42,000), 2017-2022.
- PI: AMS-Simons Travel Grant, 2014-2016.

Students

Postdocs

- Bruno Vergara, Brown.   2022-currently

- Jaemin Park, UB.   2021-2022
  Next position: ERC Postdoc at University of Basel
- Claudia García, UB.   2021-2022
  Next position: Assistant Professor at Universidad Autónoma de Madrid
- Eduardo García-Juárez, UB.   2020-2021
  Next position: Marie Curie Individual Fellow at Universitat de Barcelona
  Host: Javier Gómez-Serrano

PhD students

- Jungkyoung Na, Brown (co-advised with Benoit Pausader).   2023-
- Joel Dahne, Uppsala (co-advised with Jordi-Lluis Figueras and Warwick Tucker). 2019-2024
  Next position: TBD
- Jia Shi, Princeton (co-advised with Charles Fefferman).   2017-2022
  Next position: C. L. E. Moore instructor at MIT
- Bruno Vergara. Princeton / ICMAT. Visiting Graduate Student.   Spring 2018, Spring 2019

Masters students

- María Prat Colomer, UPC (co-advised with Tere Seara).   2023-2024

Undergraduate students

- * Gerard Castro. Brown / UPC. Double degree thesis.   2023-2024
- Zen Tamura. Brown. Summer intern   Summer 2023
- María Prat Colomer, UB. Introduction to Research Student   Summer 2022
- * Kimberly Hou, Princeton. Summer intern   Summer 2020
- * Ryan Arbon - Mohammed Mannan - Michael Psenka -
  Seyoon Ragavan, Princeton. Junior paper (as a 4-person team)   Spring 2020
- Jeff Kim, Princeton. Junior paper   Spring 2020
- * Gonzalo Cao. Princeton / UPC. Double degree thesis.   2019-2020
- * Gerard Orriols. Princeton / UPC. Double degree thesis.   2018-2019
- Joseph Obiajulu, Princeton. Senior thesis.   2016-2017
- Yuan Wang, Princeton. Senior thesis.   2016-2017

∗: publishable results.

Invited Talks at Conferences and Workshops

- Computer-assisted proofs in nonlinear analysis
  CRM Montréal   September 2024
- Fluid Dynamics, Geometry and Computer Science in Interaction
  CRM Barcelona   September 2024
- **(Plenary Talk)** Mathematics and Machine Learning 2023, Caltech   December 2023
- 50 years of Mountain Pass Theorem
  SISSA, Trieste   November 2023
- Infinite Dimensional Geometry and Fluids
  Banff International Research Station   November 2023
- Fluid Equations, A Paradigm for Complexity
  Banff International Research Station   October 2023
- AI to Assist Math Reasoning: Follow-up
  National Academy of Sciences, Washington DC   September 2023
- Numerical methods for spectral problems: theory and applications
  Kushiro, Hokkaido, Japan   August 2023
- ICIAM 2023. Parallel Session
  Computer-assisted proofs in differential equations, Tokyo   August 2023
- AI to Assist Mathematical Reasoning: A Workshop
  National Academy of Sciences (virtual)   June 2023
- Computer assisted proofs for stability analysis of nonlinear waves
  AIM Workshop, San Jose   June 2023
- Free Boundary Problems: Lecture Series and Recent Advances
  Columbia University, New York   May-June 2023
- Frontiers in Applied & Computational Mathematics
  New Jersey Institute of Technology   May 2023
- Recent Advances in Mathematical Fluid Dynamics, Duke University
  Minicourse 4 hours on Computer-assisted proofs   May 2023
- Multiscale methods and analysis for dispersive PDEs and applications to quantum materials
  IMS Singapore   February 2023
- Computational Differential Geometry and its Applications in Physics
  Simons Center for Geometry and Physics, Stony Brook   November 2022
- Computational mathematics in computer assisted proofs
  AIM Workshop, San Jose (online)   September 2022
- Semester Program on "Harmonic Analysis and Convexity"
  Minicourse 3 hours, ICERM   September 2022
- Mathematics Meets Data Science, Barcelona   September 2022

- SIAM Conference on Nonlinear Waves and Coherent Structures. Special Session
  Computer assisted theorems in dynamics, Bremen   August 2022
- Barcelona Introduction to Mathematical Research Summer Program, UB-CRM Barcelona
  Minicourse 3 hours on Analysis and PDE   July 2022
- Hypatia 2022 Graduate Summer School, CRM Barcelona
  Minicourse 5 hours on Fluid Mechanics   June 2022
- Mathematics of Fluids, CIEM, Castro Urdiales   May 2022
- Fluid Fair Workshop, Sevilla   April 2022
- Workshop on Recent developments in incompressible fluid dynamics
  IAS, Princeton   April 2022

- 12th IMACS International Conference on Nonlinear Evolution Equations & Wave Phenomena
  Special Session: Nonlinear PDEs modeling fluids and other nonlinear systems
  University of Georgia   March 2022
- International Workshop on Reliable Computing and Computer-Assisted Proofs (ReCAP 2022)
  Waseda University, Japan (online)   March 2022
- Semester Program on "Hamiltonian Methods in Dispersive and Wave Evolution Equations"
  Numerics, Modeling, and Experiments in Wave Phenomena, ICERM   September 2021
- Semester Program on "Hamiltonian Methods in Dispersive and Wave Evolution Equations"
  Minicourse 6 hours, ICERM   September 2021
- New Mechanisms for Regularity, Singularity, and Long Time Dynamics
  in Fluid Equations, Banff International Research Station (Online)   July 2021
- Thematic Program on Mathematical Hydrodynamics:
  Workshop on Free Surface Hydrodynamics, Fields Institute (virtual)   October 2020
- AMS Fall Eastern Sectional Meeting. Special Session
  Conservation Laws and Nonlinear Wave Equations, Penn State (virtual)   October 2020
- **(Plenary Talk)** V Congress of Young Researchers RSME, Castellón, Spain   January 2020
- PDE's in fluid mechanics, CIEM, Castro Urdiales
  Minicourse 3 hours   September 2019
- Summer school on fluid mechanics at the ICMAT, Madrid
  Minicourse 3 hours   June 2019
- Scientific Computing Across Scales:
  Extreme events and criticality in fluid mechanics, Fields Institute   April 2019
- Workshop: Rigorous Computational Dynamics
  in Infinite Dimensions, CRM Montréal   April 2019
- AMS Spring Sectional Meeting. Special Session
  Stability and Singularity in Fluid Dynamics. University of Hawaii   March 2019
- 12th AIMS Conference. Special Session
  Nonlinear and nonlocal evolution PDEs, Taipei   July 2018
- **(Plenary Talk)** XVIII Spanish-French School
  Jacques-Louis Lions about Numerical Simulation
  in Physics and Engineering. Univ. Las Palmas de Gran Canaria   June 2018
- Workshop "MathFluids", University of Seville   June 2018
- AMS Spring Sectional Meeting. Special Session
  Nonlinear and Stochastic PDE and Applications. Northeastern University   April 2018
- FRG-PDE Meeting, Princeton University   October 2017
- 2017 Fall Program on Analysis of PDE, Fudan University   October 2017
- 2017 Mathematical Congress of the Americas. Special Session
  Incompressible Fluid Dynamics, Montréal   July 2017
- XXV Congreso de Ecuaciones Diferenciales y Aplicaciones (CEDYA).
  Special Session: Computational Dynamical Systems, Cartagena   June 2017
- AMS Spring Eastern Sectional Meeting. Special Session
  Hydrodynamic and Wave Turbulence, Hunter College, CUNY   May 2017
- AMS Spring Western Sectional Meeting. Special Session
  Analysis on the Navier-Stokes and related PDEs, Washington State University April 2017
- Semester Program on "Singularities and Waves In Incompressible Fluids"
  Dynamics of Small Scales in Fluids, ICERM   February 2017
- V Congreso Latinoamericano de Matemáticos. Thematic Session
  Fluid dynamics, non linear and dispersive PDEs, Barranquilla, Colombia   July 2016

- 11th AIMS Conference. Special Session
  Vortex Dynamics and Geometry, Orlando   July 2016
- Analysis of PDEs of Fluid Mechanics, Rice University   May 2016
- Thematic Program on Multiscale Scientific Computing
  Extreme events and criticality in fluid mechanics, Fields Institute   January 2016
- Second International ACCA-JP/UK Workshop, Kyoto   January 2016
- Clay Research Conference and Workshops
  Water Waves and Related Fluid Models, Oxford   October 2015
- ICIAM 2015. Parallel Session
  Extreme Behaviour in Flow Models, Beijing   August 2015
- AMS Spring Western Sectional Meeting
  Special Session on Waves and Fluids, Las Vegas   April 2015
- AMS Fall Western Sectional Meeting. Special Session
  Nonlinear PDE I, San Francisco   October 2014
- 10th AIMS Conference. Special Session
  Rigorous and Numerical Methods, Madrid   July 2014
- AMS Fall Central Sectional Meeting
  Special Session on Fluid Mechanics, St. Louis   October 2013
- Rigorous computation for infinite dimensional nonlinear dynamics
  AIM Workshop, Palo Alto   August 2013
- Congress of Young Researchers RSME, Soria, Spain   September 2011
- Workshop for Young Researchers in Mathematics 2010, Madrid   September 2010
- II Seminario sobre actividades para estimular
  el talento precoz en Matemáticas, Madrid   March 2009

Seminars and Colloquia

- University of Michigan   March 2024
- Carnegie Mellon University   March 2024
- Tulane University   February 2024
- Harvard University   February 2024
- Rutgers University   November 2023
- NYU   May 2023
- Yale University   April 2023
- Georgia Tech   April 2023
- National University of Singapore   February 2023
- New Jersey Institute of Technology   November 2022
- Princeton University   October 2022
- Boston University   October 2022
- ICREA Colloquium   October 2022
- Universitat Politècnica de Catalunya   July 2022
- Universidad de Cantabria   May 2022
- One World PDE Seminar   May 2022
- MIT   April 2022
- Joint Colloquium ICMAT-UAM-UCM-UC3M   March 2022

- UC San Diego   March 2022
- Rutgers University   February 2022
- Spectral geometry in the clouds (Laval)   June 2021
- Uppsala University   May 2021
- Universitat de Barcelona   April 2021
- University of Bath   March 2021
- Penn State University   March 2021
- Wave Turbulence Seminar (Simons Collaboration)   December 2020
- Virtual Maxwell Analysis Seminar (Edinburgh)   November 2020
- CRM - CAMP (Montréal)   July 2020
- Shanghai Tech   July 2020
- Université de Rennes   January 2020
- Tulane University   October 2019
- Princeton University   September 2019
- University of Minnesota (2 talks)   February 2019
- Brown University   February 2019
- Georgia Tech   February 2019
- University of Toronto   January 2019
- Duke University   January 2019
- Brown University   November 2018
- Georgia Tech   February 2018
- UPenn   November 2017
- UIC   October 2017
- Uppsala University   June 2017
- Heriot-Watt University   April 2017
- University of Pittsburgh   January 2017
- Ohio State University   April 2016
- Columbia University   March 2016
- Brown University   November 2015
- UW Madison   November 2015
- Universidad de Sevilla   September 2015
- Princeton University   April 2014
- UPenn   February 2014
- Rutgers University   November 2013
- Universidad Autónoma de Madrid (Minicourse 3 hours)   April 2013
- Instituto de Ciencias Matemáticas   March 2013
- Instituto de Ciencias Matemáticas (Minicourse 6 hours)   February 2013
- Uppsala University   October 2012
- Universidad Autónoma de Madrid   April 2011
- CSIC (National Research Council, Madrid)   October 2009

Teaching experience (University)

- *At Brown University*
  - Math 2221 (Graduate Real Analysis) — Fall 2023
  - Math 1010 (Analysis: Functions of One Variable) — Spring 2023
  - Math 1110 (Ordinary Differential Equations) — Fall 2021
  - Math 2370 (Graduate PDE) — Fall 2020
- *At Universitat de Barcelona*
  - Introduction to Fluid Mechanics (Graduate) — Spring 2022
- *At Princeton University*
  - Math 972 (Junior Seminar: Spectral geometry) — Spring 2020
  - Math 215 (Honors Analysis) — Fall 2019
  - Math 330 (Complex Analysis with Applications) — Spring 2019
  - Math 215 (Honors Analysis) — Fall 2018
  - Math 104 (Calculus II) - two sections, course head — Fall 2017
  - Math 104 (Calculus II) - two sections, course head — Fall 2016
  - Math 104 (Calculus II) - precepts — Spring 2016
  - Math 981 (Junior Seminar: Computer-assisted proofs in analysis) — Spring 2016
  - Math 202 (Linear Algebra) - precepts — Fall 2015
  - Math 321 (Numerical Methods) — Fall 2015
  - Math 204 (Advanced Linear Algebra) — Spring 2015
  - Math 104 (Calculus II) - two sections — Fall 2014
  - Math 202 (Linear Algebra) - two sections — Spring 2014
  - Math 103 (Calculus I) — Fall 2013
- *At Universidad Autónoma de Madrid*
  - Mathematics I — Fall 2011
- *At Universitat Politècnica de Catalunya (Barcelona)*
  - Problem Workshop II — Spring 2006, Spring 2007, Spring 2008
  - Problem Workshop I — Fall 2005, Fall 2006, Fall 2007

Activities Organization and Service

- Graduate Admissions Committee, Brown — 2022/2023, 2023/2024
- Tamarkin Assistant Professor Committee, Brown — 2021/2022, 2022/2023, 2023/2024 (Chair)
- Graduate Admissions Committee, Princeton — 2016/2017, 2017/2018, 2018/2019, 2019/2020
- Director of Graduate Studies, Princeton — 2016 - 2020

- Co-organizer of the CRM Barcelona Colloquium — 2023 -
- Co-organizer of the PDE Seminar, Brown — 2021 - 2022
- Co-organizer of the ONEPAS (Virtual) Seminar — 2020 - 2021
- Co-organizer of the Analysis of Fluids Seminar, Princeton — 2015 - 2020
- Co-organizer of the Colloquium, Princeton — 2019
- Organizer of the "What's Happening in Fine Hall" Seminar, Princeton — 2016 - 2019

- Scientific Committee of the *Barcelona Analysis Conference* — June 2024
- Scientific Commission of the *Biennial Conference of the Spanish Royal Society* — January 2024

- Co-Organizer of a Parallel Session at the
  Equadiff 2024   June 2024
- Co-Organizer of a Parallel Session at the
  10th International Congress on Industrial and Applied Mathematics   August 2023
- Co-organizer of the ICERM Semester Program
  Harmonic Analysis and Convexity   Fall 2022
- Co-organizer of a Parallel Session at the
  Mathematical Congress of the Americas 2021   July 2021
- Organizer of a Parallel Session at the
  XII Americas Conference on Differential Equations and Nonlinear Analysis   December 2019
- Co-Organizer of the First Multidisciplinary Week (UAM, Madrid)   July 2010

- PhD Defense Committee of Matt Hernandez (Princeton, 2017), Jaemin Park (Georgia Tech, 2021), Teo Kukuljan (UB, 2022), Patrick Flynn (Brown, 2023).
- Reader of the PhD Thesis of In-Jee Jeong (Princeton, 2017), Bruno Vergara (UAM, 2019), Joonhyun La (Princeton, 2019), Claudia García (Granada-Rennes, 2020).
- Referee for: Advances in Mathematics, Annales de l'Institut Henri Poincaré C, Annali SNS Pisa, Annals of Mathematics, Annals of PDE, Archive for Rational Mechanics and Analysis, Asymptotic Analysis, Bulletin of the LMS, Communications in Mathematical Physics, Communications in Mathematical Sciences, Communications on Pure and Applied Mathematics, Discrete and Continuous Dynamical Systems, Duke Mathematical Journal, Forum of Mathematics: Pi, International Mathematics Research Notices, Inventiones Mathematicae, Journal de Mathematiques Pures et Appliquées, Journal of Differential Equations, Journal of Mathematical Analysis and Applications, Journal of Nonlinear Science, Journal of the American Mathematical Society, Journal of the European Mathematical Society, Monatshefte für Mathematik, Nonlinear Analysis: TMA, Nonlinearity, PNAS Nexus, Proceedings of the AMS, RACSAM, Rendiconti del Circolo Matematico di Palermo, Revista Matemática Iberoamericana, SIAM Journal on Applied Dynamical Systems, SIAM Journal on Mathematical Analysis, SIAM Journal on Scientific Computing, Transactions of the AMS.
- External Referee for the "Programme for Postdoctoral Talent Attraction" (UAM).
- NSF Panelist (x3). NWO (Dutch Agency) External Reviewer. ANEP (Spain) External Reviewer.

Outreach

- Co-Organizer of the Barcelona Introduction to Mathematical Research 2022   July 2022
- Lecturer at the Smartick Mathematics and Technology Summer Camp for girls   July 2017
- Lecturer at the BarcelonaTech
  Math Summer Camp (UPC)   July 2015, 2016, 2017, 2018, 2019, 2021
- Lecturer at the JAE School of Mathematics (ICMAT, Madrid)   July 2013, 2019
- Deputy Leader of the Spanish delegation at the
  Iberoamerican Mathematical Olympiad   September 2011, 2012
- Evaluator at the Spanish Mathematical Olympiad   March 2010, 2011, 2012, 2013
- Problemsetter and Evaluator at the ACM ICPC -
  Southwestern Europe Regional Contest   October 2009, 2010, 2011
- Deputy Leader of the Spanish delegation at the
  International Olympiad in Informatics   August 2007, 2009
- Problemsetter and Evaluator at the Spanish Olympiad in Informatics   June 2007

- Problem Selection Committee for the
  Assemblée générale de 'Le Kangourou sans frontières'   June 2006
- Trainer for the Spanish (and International) Math. Olympiad   2004-2007
- Selection Committee, interviewer and teacher of the ESTALMAT
  (Stimulus of the Mathematical Talent) Project   2003 - 2013, 2018

Languages

- Spanish: Mother tongue.
- English: Certificate in Advanced English obtained in 2009.
- German: Zentrale Mittelstufenprüfung obtained in 2003. German University Entrance Exams (Abitur) passed with a 1.8 grade in a scale between 1.0 (best) and 6.0 (worst).
- French: Intermediate.
- Catalan: Intermediate.