

Élder Jesús Villamizar Roa

Curriculum Vitae

Universidad Industrial de Santander
Mathematics Department
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EDUCATION

State University of Campinas, Brazil	Ph.D. Mathematics	2002 – 2005
State University of Campinas, Brazil	M.Sc. Mathematics	2000 – 2002
Universidad Industrial de Santander, Colombia	B.Sc. Lic. Mathematics	1995 – 2000

PROFESSIONAL EXPERIENCE

Mathematics Department, Universidad Industrial de Santander, Bucaramanga, Colombia

Full Professor

Since October 2010.

Mathematics Department, Universidad Nacional de Colombia-Sede Medellín, Colombia

Associate Professor

February 2009- October 2010.

Mathematics Department, Universidad Industrial de Santander, Bucaramanga, Colombia

Assistant Professor

August 2005- January 2009.

TEACHING EXPERIENCE

At the Universidad Industrial de Santander

Calculus, Vector Calculus, Ordinary Differential Equations, Complex Variable, Real Analysis, Measure Theory, Linear Algebra, Topology, Vector Analysis, Functional Analysis, Partial Differential Equations, Topics in Fuzzy Analysis, Optimization, Set Theory, Numerical Analysis, Topics in Applied Mathematics.

At the Universidad Nacional de Colombia, Medellín

Vector Calculus, Ordinary Differential Equations, Partial Differential Equations, Measure Theory, Vector Analysis, Functional Analysis.

RECOGNITIONS

- **JOSÉ FERNANDO ESCOBAR Prize by the Sociedad Colombiana de Matemáticas** (2025).
- **Official Recognition by the Vicerrectoría de Investigación of the Universidad Industrial de Santander**, by Research Activity (2014-2015).
- **TWAS prize for young Colombian Scientifics**, Third World Academy Sciences (2008).
- **Official Recognition by the Academic Council of the Universidad Industrial de Santander**, by Teaching and Research Activities (2008).
- **Beca COLCIENCIAS** (2002), proyecto BID III- etapa, Colombia. Scholarship awarded to pursue Ph.D. degree.
- **Bolsa CAPES, Brazil** (2000). Scholarship awarded to pursue Master degree.

PAPERS PUBLISHED

1. **Solvability of the Nonlinear Plate Equations in Besov Spaces.** (join with C. Banquet and J. E. Pérez-López) *Asymptotic Analysis*, 146 (2026), No. 2, 79-105.
2. **Large global bounded solutions for the parabolic-elliptic Keller-Segel system via a framework of sum-closed frequency sets.** (join with V. Angulo-Castillo and L.C.F. Ferreira) *Nonlinear Anal.* 264 (2026), Paper No. 114000, 9 pp.
3. **On a class of nonlinear plate equations on modulation spaces.** (join with C. Banquet and L. Corpa-Liñan). *Potential Anal.* 63 (2025), No. 833-860.
4. **An optimal control problem of a 2D-attraction-repulsion chemotaxis system.** (join with J. Huayta-Centeno and E. Mallea-Zepeda). *Optim. Lett.* 19 (2025), no. 6, 1125-1155.
5. **On a Cross-Diffusion Model in Ecohydrology: Theory and Numerics.** (join with I. Moreno-Villamil and D.A. Rueda-Gómez). *Acta Applicandae Mathematicae*. V. 196, (2025), No. 1, 29p.
6. **On a Class of Nonlinear Plate Equations on Modulation Spaces** (join with C. Banquet and L. Corpa-Liñan). *Potential Analysis*. (2025). <https://doi.org/10.1007/s11118-025-10190-8>
7. **On the Theoretical and Numerical Analysis of a Vegetation Model with Cross-Diffusion** (join with I. Moreno-Villamil and D.A. Rueda-Gómez). *Analysis and PDE in Latin America, ICMAM 2022*. (2025).
8. **An optimal control problem of a 2D-attraction-repulsion chemotaxis system** (join with J. Huayta-Centeno and E. Mallea-Zepeda). *Optimization Letters*. (2025). <https://doi.org/10.1007/s11590-024-02162-5>.

9. **Comparison of two approaches for solving a fuzzy system describing the degradation kinetics of pesticides in plant uptake models** (join with L. Espitia-Cruz). Math. Model. Nat. Phenom. v. 19, (2024), No. 22, 18p.
10. **Numerical Analysis for a Non-isothermal Incompressible Navier-Stokes-Allen-Cahn System** (join with D.A. Rueda-Gómez and E. E. Rueda-Fernández). Journal of Math. Fluid Mechanics. v. 26, (2024), No. 63, 28p.
11. **On the fractional heat semigroup and product estimates in Besov spaces and applications in theoretical analysis of the fractional Keller-Segel system** (join with J.E. Pérez-López and D.A. Rueda-Gómez). Bol. Soc. Mat. Mex. v. 30, (2024), No. 3, Paper No.88, 25p.
12. **On the solvability of a space-time fractional nonlinear Schrödinger system** (join with C. Banquet and E. González). Partial Differential Equations in Applied Mathematics. v. 11, (2024), 100803.
13. **Intrinsic growth rate and evolution of the Premnotypes Vorax population** (join with G. Arenas-Díaz and L.V. Espitia-Cruz). Biosystems. v. 237, (2024), 105161.
14. **An optimal control problem for a Lotka-Volterra competition model with chemo-repulsion** (join with D.I. Hernández and D.A. Rueda-Gómez). Acta Math. Sci. Ser. B (Engl. Ed.). v. 44, No. 2, (2024), 721-751.
15. **On the existence theory for the nonlinear thermoelastic plate equation** (join with C. Banquet and M. Doria). Appl. Analysis v. 103, No. 4, (2024), 636-656.
16. **On the existence theory of a time-space fractional Klein-Gordon-Schrödinger system** (join with C. Banquet and N. Guerra). J. Integral Equations Appl. v. 35, No. 4, (2023), 407-426.
17. **Existence of global solutions for cross-diffusion models in a fractional setting** (join with J.E. Pérez-López and D.A. Rueda-Gómez). Electron. J. Differential Equations. (2023), Paper No.77, 17 pp.
18. **Stationary solutions to a chemo-repulsion system and a related optimal bilinear control problem** (join with S. Lorca and E. Mallea-Zepeda). Bull. Brazilian Math. Soc.(NS) v. 54, No. 3, (2023), Paper No.39, 31 pp.
19. **An optimal control problem for the Navier-Stokes-a system** (join with E. Mallea-Zepeda and E. Ortega-Torres). Journal of Dyn. Control Syst. v. 29, No. 1, (2023), 129-156.
20. **Theoretical and numerical analysis of a parabolic system with chemoattraction modeling the growth of glioma cells** (join with J. L. López-Agreto and D.A. Rueda-Gómez). Appl. Numer. Math. v. 186, (2023), 143-163.

21. **Numerical analysis of a mathematical model describing the evolution of hypoxic glioma cells** (join with J. L. López-Agreto and D.A. Rueda-Gómez). *Comput. Math. Appl.* v. 131, (2023), 138-157.
22. **On a chemotaxis-Navier-Stokes system with Lotka-Volterra competitive kinetics: theoretical and numerical analysis** (join with C. M. Beltrán-Larrotta and D. A. Rueda-Gómez). *Appl. Numer. Math.* v. 184, (2023), 77-100.
23. **Global existence and asymptotic behavior of solutions for a fractional chemotaxis-Navier-Stokes system** (join with M.A. Fontecha-Medina). *Dyn. Partial Differ. Equ.* v. 19, No. 4, (2022), 285-309.
24. **Applications of generalized fixed points theorems to the existence of uncertainly hyperbolic partial differential equations with finite delay** (join with V. Angulo-Castillo, Y. Chalco-Cano). *Comput. Appl. Math.* v. 41, No. 4, Paper No. 182, (2022), 29 pp.
25. **Numerical analysis of a chemotaxis model for tumor invasion** (join with J.E. Pérez-López, D.A. Rueda-Gómez). *Adv. Comput. Math.* v. 48, No. 3, Paper No. 26, (2022), 28 pp.
26. **On the existence theory for nonlinear plate equations** (join with C. Banquet, G. Garbugio). *Angew. Math. Phys.* v. 73, No. 1, Paper No. 10, (2022), 25 pp.
27. **A 2D model for heat transport in a Hele-Shaw geometry** (joint with J. López-Ríos). *J. Math. Fluid Mech.* v. 23, No. 4, paper No. 89 (2021), 28 pp.
28. **An optimal control problem related to a 3D-chemotaxis-Navier-Stokes model** (joint with J. López-Ríos). *ESAIM Control Optim. Calc. Var.* v. 27, paper No. 58, (2021), 37 pp.
29. **Convergence and positivity of finite element methods for a haptotaxis model of tumoral invasion** (joint with V. Niño-Celis, D.A. Rueda-Gómez). *Comp. Math. Appl.* v. 89, (2021), 20-33.
30. **Numerical analysis for a chemotaxis-Navier-Stokes system** (joint with A. Duarte-Rodríguez, M.A. Rodríguez-Bellido, D.A. Rueda-Gómez). *ESAIM Math. Model. Numer. Anal.*, v. 55, (2021), 417-445.
31. **Time-decay and Strichartz estimates for the BBM equation on modulation spaces: existence of local and global solutions** (joint with C. Banquet). *J. Math. Anal. Appl.*, v. 498, No. 1, paper No. 124934, (2021), 23 pp.
32. **Global existence for an attraction-repulsion chemotaxis-fluid system in a framework of Besov-Morrey type** (joint with A. Duarte-Rodríguez, L.C.F. Ferreira). *J. Math. Fluid mech.*, v. 22, No. 4, paper No.63, (2020), 18 pp.

33. **Convergence rates of approximations of incompressible flows through granular porous media** (joint with R.C. Cabrales, M.A. Rojas-Medar). GEM-International Journal of Geomathematics, v. 11, No. 1, paper No.19, (2020), 27pp.
34. **On a bi-dimensional chemo-repulsion model with nonlinear production and a related optimal control problem** (joint with F. Guillén-González, E. Mallea-Zepeda). Acta Appl. Math. v.170, (2020), 963-979.
35. **Applications of generalized fixed points theorems to the existence of uncertain differential equations with finite delay** (joint with V. Angulo, Y. Chalco-Cano, A. Khastan). Iranian Journal of Fuzzy systems, v. 17, No. 6, (2020), 1-15.
36. **Existence theory for the Boussinesq equation in modulation spaces** (joint with C. Banquet). Bull. Brazilian Math. Soc. New series, v. 51, No.4 (2020), 1057-1082.
37. **On the Rayleigh-Bénard-Marangoni problem: Theoretical and numerical analysis** (joint with J. Pérez-López, D.A. Rueda-Gómez). Journal of Computational Dynamics, v. 7, No.1 (2020), 159-181.
38. **On the management fourth-order Schrödinger-Hartree equation** (joint with C. Banquet). Evolution Equations and Control Theory, v. 9, No.3 (2020), 865-889.
39. **An optimal control problem for the steady nonhomogeneous asymmetric fluids** (joint with E. Mallea-Zepeda and E. Ortega-Torres). Applied Mathematics and Optimization, v. 80, No.2 (2019), 299-329.
40. **Global existence for an attraction-repulsion chemotaxis fluid model with logistic source** (joint with A. Duarte-Rodríguez and L.C.F. Ferreira). Discrete and Continuous Dynamical System-B, v.24, No.2 (2019), 423-447.
41. **On the product in Besov-Lorentz-Morrey spaces and existence of solutions for stationary Boussinesq equations** (joint with L.C.F. Ferreira and J.E. Pérez-López). Communications on Pure and Applied Analysis, v. 17, No. 6 (2018), 2423-2439.
38. **On a distributed control problem for a coupled chemotaxis-fluid model** (joint with María A. Rodríguez-Bellido and Diego A. Rueda-Gómez). Discrete and Continuous Dynamical System-B, v. 23, No. 2 (2018), 557-571.
39. **On the Rayleigh-Bénard-Marangoni system and a related optimal control problem** (joint with Diego A. Rueda-Gómez). Computers and Mathematics with Applications, v. 74, No. 12 (2017), 2969-2991.
40. **Solutions in Bessel-potential spaces for wave equations with nonlinear damping** (joint with C. Banquet and L.C.F. Ferreira). Mathematical Methods in the Applied Sciences, v. 40, No. 15 (2017), 5613-5618.

41. **On the non-newtonian fluids with convective effects** (joint with S. Herrón). Elec. Journal of Differential Equations, v. 2017, No. 155 (2017), 1-28.
42. **Global existence of weak solutions for a $n \times n$ system of chromatography** (joint with Y. Lu, J. Xie). Nonlinear Analysis: Real World Applications, v. 37, No. 2 (2017), 309-316.
43. **A boundary control problem for micropolar fluids** (joint with E. Mallea-Zepeda and E. Ortega-Torres). Journal of Optimization Theory and Applications, v. 169, No.2 (2016), 349-369.
44. **On the Schrodinger equation with isotropic and anisotropic fourth-order dispersion** (joint with C. Banquet). Elec. Journal of Differential Equations, v. 2016, No. 13 (2016), 1-20.
45. **On the existence and scattering theory for the Klein-Gordon-Schrodinger system in an infinite L^2 -norm setting** (joint with C. Banquet and L.C.F. Ferreira). Annali di Matematica Pura ed Applicata, v. 194, (2015), 781-804.
46. **Interval-valued functions in a quotient space**, (joint with Y. Chalco-Cano and H. Román-Flores). Proceedings 2015 Annual Conference of the North American Fuzzy Information Processing Society (NAFIPS) (2015).
47. **Existence of solutions to fuzzy differential equations with generalized Hukuhara derivative via contractive-like mapping principles** (joint with V. Angulo and Y. Chalco- Cano). Fuzzy Sets and Systems, v. 265, (2015), 24-38.
48. **On the nonhomogeneous Navier-Stokes system with Navier friction boundary conditions** (joint with G. Planas and L.C.F. Ferreira). SIAM Journal of Mathematical Analysis, v. 45, No. 4, (2013), 2576-2595.
49. **On the Schrodinger-Boussinesq system with singular initial data** (joint with L.C.F. Ferreira and C. Banquet). Journal of Mathematical Analysis and Applications, v. 400, No. 2, (2013), 487-496.
50. **Strong solutions and inviscid limit for Boussinesq system with partial viscosity** (joint with L.C.F. Ferreira). Communications in Mathematical Sciences, v. 11, No.2, (2013), 421-439.
51. **On the Davey-Stewartson system with singular initial data** (joint with J.E. Pérez- López). Comptes Rendus Mathematique, v. 350, No.21-22, (2012), 959-964.
52. **Self-similarity and asymptotic stability for coupled nonlinear Schrodinger equations in high dimensions** (joint with L.C.F. Ferreira). Physica D-Nonlinear Phenomena, v. 241, (2012), 534-542.
53. **Fractional Navier-Stokes equations and Holder-type inequality in a sum of singular spaces** (joint with L.C.F. Ferreira). Nonlinear Analysis. Theory Methods and Applications. v. 74, (2011), 5618-5630.

54. **A semilinear heat equation with a localized nonlinear source and non-continuous initial data** (joint with L.C.F. Ferreira). *Mathematical Methods in the Applied Sciences*, v. 74, (2011) 1-18.
55. **On a generalized Boussinesq model around a rotating obstacle: Existence of strong solutions** (joint with E. Ortega-Torres). *Discrete and Continuous Dynamical Systems-B*, v. 15, (2011), 825-847.
56. **On the heat equation with concave-convex nonlinearity and initial data in weak-L_p spaces** (joint with L.C.F. Ferreira). *Communications on Pure and Applied Analysis*, v.10, (2011), 1715-1732.
57. **A note on the Cauchy problem of fuzzy differential equations** (joint with W.González-Calderón). *Academia Colombiana de Ciencias Exactas, Físicas y Naturales*, v. 34, (2010), 541-552.
58. **Exponentially-stable steady flow and asymptotic behavior for the magnetohydrodynamic equations** (joint with L.C.F. Ferreira). *Communications Mathematical Sciences*, v. 9, (2011), 499-516.
59. **Micropolar fluids with vanishing viscosity** (joint with E.Ortega-Torres & M.A. Rojas-Medar). *Abstract and Applied Analysis*, p.18, (2010).
60. **Periodic solutions in unbounded domains for the Boussinesq system** (joint with M.A. Rodríguez-Bellido & M.A. Rojas-Medar). *Acta Mathematica Sinica-English Series*, v.26, (2010), 837 - 862.
61. **On the existence of solutions for the Navier-Stokes system in a sum of weak-L^p spaces** (joint with L.C. F. Ferreira). *Discrete and Continuous Dynamical Systems*, v.27, (2009), p.171 - 183.
62. **On the stability problem for the Boussinesq equations in weak-L^p spaces** (joint with L.C. F. Ferreira). *Communications on Pure and Applied Analysis* v.09, (2010), 667- 684.
63. **Strong solutions for the nonhomogeneous Navier-Stokes equations in unbounded domains** (joint with M.A. Rojas-Medar & P. Braz e Silva). *Mathematical Methods in the Applied Sciences*, v.33, (2010), 358-372.
64. **On the existence of infinite energy solutions for nonlinear Schrodinger equation** (joint with L.C.F. Ferreira & P. Braz e Silva). *Proceedings of The American Mathematical Society*, v.137, (2009), 1977-1987.
65. **Existence of solutions to the convection problem in a pseudo measure-type space** (joint with L.C. F. Ferreira). *Proceedings of the Royal Society A-Mathematical Physical and Engineering Sciences*, v.464, (2008), 1983-1999.

66. **Very weak solutions for the magnetohydrodynamic type equations** (joint with G. Arenas-Díaz, H. Lamos). Discrete and Continuous Dynamical Systems-B, v.10, (2008), 957 -972.
67. **Comportamiento en el infinito de las soluciones de una clase abstracta de ecuaciones de evolución** (joint with G. Arenas-Díaz, H. Lamos). Academia Colombiana de Ciencias Exactas, Físicas y Naturales, v.32, (2008), 47 -59.
68. **Global existence and exponential stability for the micropolar fluid system** (joint with M.A. Rodríguez-Bellido). Zeitschrift fur Angewandte Mathematik und Physik, v.59, (2008), 790 - 809.
69. **Micropolar fluid system in a space of distributions and large time behavior** (joint with L.C.F. Ferreira). Journal of Mathematical Analysis and Applications, v.332, (2007), 1424 - 1444.
70. **On the existence and stability of solutions for the micropolar fluids in exterior domains** (joint with L.C.F. Ferreira). Mathematical Methods in the Applied Sciences, v.30, (2007), 1185-1208.
71. **Self-similar solutions, Uniqueness and Long Time Asymptotic Behaviour for the Semilinear Heat Equations** (joint with L.C.F. Ferreira). Differential and Integral Equations, v.19, (2006), 1349-1370.
72. **The Boussinesq system with mixed nonsmooth boundary data** (joint with M.A. Rodríguez-Bellido & M.A. Rojas-Medar). CRAS Comptes Rendus Mathématique, v.343, (2006), 191 - 196.
73. **Well-posedness and asymptotic behaviour for the convection problem in R^n** (joint with L.C.F. Ferreira). Nonlinearity, v.19, (2006), 2169-2191.
74. **Some properties of a class of abstract stationary equations** (joint with M.A. Rodríguez-Bellido & M.A. Rojas-Medar). Nonlinear Analysis-Theory Methods and Applications, v.64, (2006), 2203 -2214.
75. **Continuous dependence of very weak solutions for the Navier-Stokes equations**. Revista Integración, v.23, (2005), 11-16.

BOOKS

- **Introducción a las ecuaciones diferenciales difusas** (joint with Gilberto Arenas Díaz). Ediciones Universidad Industrial de Santander (2018), ISBN:978-958-8956-47-3.
- **Topología general** (joint with Javier Enrique Camargo García). Ediciones Universidad Industrial de Santander, (2019), ISBN:978-958-8956-60-2. Segunda versión (2025).

EDITORIAL WORK

- Member of the Editorial board of the **Revista Integración**. Revista Integración is a Colombian mathematical journal which publishes original research papers in all areas in mathematics; Please visit the webpage: <http://matematicas.uis.edu.co/integracion/>.
- Member of the Editorial board of the **Revista Colombiana de Matemáticas**; Please visit the webpage: <https://revistas.unal.edu.co/index.php/recolma/index>
- Referee of the following mathematical journals:
 - Applied Mathematical Letters
 - Applied Mathematics and Optimization
 - Asymptotic Analysis
 - Aplicable Analysis
 - Acta Mathematica Scientia
 - Acta Applicandae Mathematicae
 - Bulletin des Sciences Mathématiques
 - Bulletin of the Malaysian Mathematical Sciences Society
 - Chaos Solitons and Fractals
 - Computers & Mathematics with Applications
 - Communications on Pure and Applied Analysis
 - Communications in Nonlinear Science and Numerical Simulation
 - Computational and Applied Mathematics
 - Discrete and Continuous Dynamical Systems Series B
 - Discrete and Continuous Dynamical Systems Series S
 - Dynamics of Continuous, Discrete and Impulsive Systems, Series A. Math. Anal.
 - ESAIM Control Optim. Cal. Var.
 - European Journal of Control
 - Fuzzy Sets and Systems
 - Mathematical Methods in the Applied Sciences
 - Mathematische Nachrichten
 - Nonlinear Analysis: Real World Applications
 - Nonlinear Sciences
 - Journal of Mathematical Fluid Mechanics
 - Journal of Mathematical Analysis and Applications
 - Proceedings of the Royal Society, Math. Phys. Eng. Sci.
 - Physica D
 - Revista Acad. Col. Ciencias Exac. Fis y Nat. (ACCEFYN)
 - Revista de la Unión Matemática Argentina
 - Revista Colombiana de Matemáticas
 - Revista Integración
 - SeMA Journal
 - Vietnam Journal of Mathematics

1. **Jefferson Sneyder Moreno Tolosa** (B.Sc. 2026). "Ramificación, bifurcación y longitud del Sistema vascular, visto desde las Ecuaciones de Navier-Stokes".
2. **Juan Nicolás Peña Moreno** (B.Sc. 2025). "Existencia de soluciones débiles globales para las ecuaciones P-Navier-Stokes".
3. **Leanis Ortiz Gómez** (M.Sc. 2025). "Análisis teórico de un sistema de competición interespecies con quimiorepulsión".
4. **Leidy Vanesa Espitia Cruz** (M.Sc. 2024). "Implementación de herramientas matemáticas basadas en la lógica fuzzy, a problemas de producción agrícola".
5. **Iván Moreno Villamil** (M.Sc. 2024). "Análisis teórico y numérico de sistemas diferenciales de tipo Klausmeier describiendo la interacción y la autoorganización de especies vegetales".
6. **Elian Esteban Rueda Fernández** (M.Sc. 2024). "Análisis matemático de un sistema tipo Allen-Cahn-Navier-Stokes para fluidos no isotérmicos".
7. **Juan José Forero Hernández** (B.Sc. 2023). "Análisis teórico de un problema de control óptimo asociado a un modelo de campo de fase que describe la evolución de tumores cerebrales con efectos terapéuticos".
8. **Oscar Emiro Ozuna Pastrana** (M.Sc. 2023). "Análisis teórico del sistema de Schrödinger-Boussinesq fraccionario en tiempo y espacio".
9. **Daniel Andrés Figueroa Pérez** (B.Sc. 2023). "Una introducción al estudio de la formación de patrones de Turing".
10. **Julieth Daniela Carreño González** (B.Sc. 2023). "Análisis teórico de un modelo estacionario de quimiotaxis con condiciones de frontera no homogéneas".
11. **Diana Isabel Hernández Rojas** (M.Sc. 2023). "Un problema de control óptimo relativo a un modelo de tipo Lotka-Volterra".
12. **Jorge Leonardo López Agredo** (M.Sc. 2023). "Análisis teórico y numérico de un modelo matemático con quimioatracción que describe el crecimiento de los glioblastomas cerebrales".
13. **Álvaro J. Chaparro Villamizar** (B.Sc. 2022). "Análisis teórico de un modelo de ecuaciones diferenciales que describe la evolución del glioblastoma".
14. **Nafer E. Guerra Ramos** (M.Sc. 2022). "Estudio de un sistema de Klein-Gordon-Schrödinger fraccionario en tiempo y espacio en el marco de los espacios L_p débiles".
15. **Mario M. Doria Jiménez** (M.Sc. 2022). "Existencia de soluciones para una ecuación no lineal de placas termoelásticas".
16. **Edilberto González Cavadía** (M.Sc. 2022). "Existencia de soluciones para un sistema no lineal de ecuaciones de Schrödinger de orden fraccionario".
17. **Luis Enrique Corpa Liñán** (M.Sc. 2022). "Análisis teórico de un modelo de deflexión de placas".
18. **Carlos Mateo Beltrán Larrotta** (M.Sc. 2022). "Análisis teórico y numérico de EDP con difusión cruzada describiendo dinámicas poblacionales en fluidos".

19. **Miguel Ángel Fontecha Medina** (M.Sc. 2022). "Existencia global y comportamiento asintótico de soluciones para un sistema de quimiotaxis-Navier-Stokes en el contexto fraccionario".
20. **Viviana Niño Celis** (M.Sc. 2021). "Análisis matemático de un modelo de haptotaxis para la invasión tumoral".
21. **Duván Alexis Contreras Páez** (M.Sc. 2021). "Análisis teórico de las ecuaciones diferenciales difusas de orden fraccionario".
22. **Natalia Stefanía Garzón Laguado** (B.Sc. 2021). "Una introducción a la teoría de la optimización difusa".
23. **Danna Katherine Chávez-Sánchez** (B.Sc. 2021). "Una Introducción al uso de las funciones de base radial para resolver numéricamente ecuaciones diferenciales parciales".
24. **Nicolás Luna Chacón** (B.Sc. 2020). "Una introducción a los sistemas de control difuso".
25. **Jesús Fernando Carreño Díaz** (M.Sc. 2019). "El espacio de las medidas de Radon y aplicaciones".
26. **Miguel Ángel Fontecha** (B.Sc. 2018). "Ecuaciones de Navier-Stokes en un espacio de distribuciones".
27. **Abelardo Duarte Rodríguez** (M.Sc. 2018). "Análisis teórico de un modelo matemático de la quimiotaxis atractivo-repulsiva, con crecimiento logístico, en fluidos".
28. **Laura Milena Romero Parada** (M.Sc. 2016). "Introducción a la teoría de fluidos no newtonianos".
29. **Exequiel Enrique Mallea Zepeda** (PhD. 2015). "Algunos problemas de control óptimo para fluidos micropolares" (coadvisor).
30. **Jorge Leonardo López Agredo** (B.Sc. 2015). "Una introducción a la ecuación de Schrodinger".
31. **Diego Armando Rueda Gómez** (M.Sc. 2014). "Un problema de control óptimo asociado al modelo de Rayleigh-Bénard-Marangoni".
32. **Vladimir Angulo** (Master 2013). "Ecuaciones diferenciales difusas y aplicaciones en teoría de control".
33. **Jhean Eleison Pérez López** (M.Sc. 2012). "Estudio cualitativo del sistema de Davey-Stewartson con dato inicial singular".
34. **Alexander Reátiga Villamizar** (M.Sc. 2010). "Diferenciabilidad de multifunciones y aplicaciones en el contexto difuso".
35. **William González Calderón** (M.Sc. 2010). "Ecuaciones diferenciales ordinarias difusas".
36. **Juan Gabriel Galeano Delgado** (M.Sc. 2009). "Existencia global y estabilidad de soluciones para las ecuaciones de la magnetohidrodinámica (MHD)".
37. **Vladimir Angulo** (B.Sc. 2010). "Puntos fijos de multifunciones difusas".
38. **Carolina Vesga Mantilla** (B.Sc. 2007) "Funciones invexas diferenciables y el Teorema de Karush-Kuhn-Tucker".
39. **Carmen Cecilia Ballesteros Quiroga** (B.Sc. 2007) "Curvas características en ecuaciones diferenciales parciales de primer orden".
40. **Ángela María Guzmán Hernández** (B.Sc. 2007) "La función delta de Dirac: Una introducción a la teoría de las distribuciones".

41. Nicolás Cáceres Moreno (B.Sc. 2006) "Espacios y convergencia de conjuntos difusos".

SOME LECTURES

- **Analysis of a water-biomass model in hydroecology**, Tercer Workshop en Matemática Multidisciplinar, Concepción, Chile, November 2024.
- **On a cross-difusion model in ecohydrology**, V Workshop de Matemáticas Aplicadas, Arica, Chile, July 2024.
- **On a three-dimensional chemo-repulsion model with nonlinear production**, VI Workshop on Nonlinear Analysis and PDE, Manizales, Colombia, June 2023.
- **On some cross-diffusion models describing biological dynamics**, XXIII Congreso Colombiano de Matemáticas, Tunja, Colombia, June 2023.
- **Theoretical and numerical analysis for a model of glioma invasion**, XXVII Congress of Differential Equations and Applications and XVII Congress of Applied Mathematics, Zaragoza, Spain, July 2022.
- **Modulation spaces and applications in the solution of PDE models**, XX Congreso Colombiano de Matemáticas, Popayán, June 2019.
- **Some PDE models in modulation spaces**, V Taller de análisis no lineal, Universidad Nacional de Colombia, Bogotá, June 2019.
- **On the existence and regularity of solutions for a chemotaxis-Navier-Stokes system**, ICMC Summer Meeting on Differential Equations, Sao Carlos, Brazil, February 2019.
- **An control problem associated to the Chemotaxis phenomenon**, X Simposio Nororiental de Matemáticas, Bucaramanga, Colombia, December 2018.
- **An Introduction to chemotaxis models in fluids**, Coloquio Universidad Yachay Tech, Ibarra, Ecuador, November 2017.
- **On the Keller-Segel-Navier-Stokes system**, IV Taller de Análisis no Lineal y Ecuaciones Diferenciales Parciales, Universidad Nacional de Colombia, Manizales, Colombia, July 2017.
- **On the attraction-repulsion chemotaxis fluid models**, XXI Congreso Colombiano de Matemáticas, Universidad Nacional de Colombia, Bogotá, Colombia, June 2017.
- **Tópicos en Ecuaciones Diferenciales Parciales (minicurso)**, V Escuela de invierno-EIMZA 2016, Universidad Nacional de San Antonio Abad del Cusco, Cusco, Perú, August 2016.
- **Algunos problemas elípticos en mecánica de fluidos**, XX Congreso Colombiano de Matemáticas, Universidad Nacional de Colombia Sede Manizales, Manizales, Colombia, July 2015.
- **On the Navier-Stokes equations for flows with shear dependent viscosity**, X Americas Conference on Differential Equations and Nonlinear Analysis, Universidad de Buenos Aires, Buenos Aires, Argentina, February 2015.
- **On the Navier-Stokes system with variable density and Navier friction boundary conditions**, International Congress of Mathematicians, Seoul, Korea, August 2014.
- **Ecuaciones de Navier-Stokes con condiciones de Navier**, VIII Simposio Nororiental de Matemáticas, Universidad Industrial de Santander, Bucaramanga, Colombia, December 2013.
- **Some results of the Schrodinger equation with fourth-order dispersion**, Seminários Equações Diferenciais, Universidade Estadual de Campinas, Brazil, April 2013.
- **Una introducción a las ecuaciones de Navier-Stokes**, Coloquio semanal Universidad de los Andes, Bogotá, Colombia, November 2013.

- **Some results of the non-homogeneous Navier-Stokes with slip boundary conditions**, XIX Congreso Colombiano de Matemáticas, Barranquilla, Colombia, July 2013.
- **Existencia y regularidad de solución para las ecuaciones de Navier-Stokes: Uno de los problemas del milenio**, XXII Jornada de Matemáticas y Estadística, Universidad Pedagógica y Tecnológica de Colombia, Tunja, Colombia, November 2012.
- **Solución de problemas de valor inicial de tipo dispersivo con datos iniciales singulares. Aplicación del principio de contracciones**, II Taller de análisis no lineal y ecuaciones diferenciales parciales, Universidad Nacional de Colombia, Bogotá, Colombia, June 2012.
- **Existence of very weak solutions for the Navier-Stokes and Boussinesq systems**, IX Americas Conference on Differential Equations, Trujillo, Perú, January 2012.
- **Problemas de control óptimo en mecánica de fluidos**, XVIII Congreso Colombiano de Matemáticas, Bucaramanga, Colombia, July 2011.
- **Fluidos incompresibles a través de medios porosos no consolidados**, III Workshop Iberoamericano de matemática aplicada, Chillán, Chile, January 2010.
- **Las Ecuaciones de Navier-Stokes en el marco de los Problemas Clay**, IV Simposio Nororiental de Matemáticas, Bucaramanga, Colombia, December 2009.
- **Some results on the heat equation with concave-convex nonlinearity**, Evento: XVII Congreso Colombiano de Matemáticas, Cali, Colombia, August 2009.
- **Problemas de valor inicial y de frontera en mecánica de fluidos**, Congreso Nacional Universitario de Física, Puebla, México, February 2009.
- **Existence of solutions for the Navier-Stokes equations in sum of weak-Lp spaces**, II Workshop Iberoamericano de matemática aplicada, Chillán, Chile, December 2008.
- **Well-posedness and asymptotic behavior for the Boussinesq problem in R^n** , XX Congreso de Ecuaciones Diferenciales y Aplicaciones y X Congreso de Matemática Aplicada-CEDYA, Sevilla, España, September 2007.
- **On the existence of infinite energy solutions for nonlinear Schrodinger equation**, XVI Congreso Nacional de Matemáticas, Medellín, Colombia, August 2007.
- **On the well-posedness and asymptotic behavior for the Boussinesq problem in nD** , Seventh Americas School in Differential Equations and Nonlinear Analysis. Cartagena, Colombia, August 2007.
- **Self similar solutions, uniqueness and long-time asymptotic behavior for the semilinear heat equations**, International Conference in Memory of Jose Escobar 'Chepe' 1954-2004, Cali, Colombia, February 2006.
- **Aspectos básicos de la Teoría de conjuntos difusos**, 5° Simposio Nororiental de Matemáticas, Bucaramanga, Colombia, December 2005.
- **On the existence of very weak solutions for the stationary Boussinesq equations**, XV Congreso Colombiano de Matemáticas, Bogotá, Colombia, August 2005.
- **On the time-periodicity of Boussinesq equations in the Lorentz spaces**, 61 Seminario Brasileiro de Analise, Sao Joao del Rei, Brasil, Mayo 2005.