

David V. Cruz-Uribe, OFS

Curriculum Vitae

Department of Mathematics
University of Alabama
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Citizenship U.S.

Education

- A.B. in mathematics, University of Chicago, 1985.
- Ph.D. in mathematics, University of California, Berkeley, 1993.
Donald Sarason, advisor; Dissertation: *Piecewise monotonic doubling measures.*

Faculty Positions

- Research Assistant Professor, Purdue University, 1993 to 1996.
Christoph Neugebauer, postdoctoral advisor.
- Assistant Professor, Trinity College, 1996 to 2002.
- Associate Professor, Trinity College, 2002 to 2005.
- Full Professor, Trinity College, 2005 to 2015.
- Department Chair, Trinity College, 2008 to 2010.
- Professor and Chair, University of Alabama, 2015 to 2023.
- Professor, University of Alabama, 2023 to present.

Postdocs Supervised

- Cristian Rios, 2004 to 2007.
- Li-An Daniel Wang, 2012 to 2015.
- Hanh Nguyen, 2016 to 2019.
- Brandon Sweeting, 2021 to 2024.
- Fatih Şirin, 2023 to present.
- Şeyma Çetin, 2023 to present.

Graduate Students Supervised

- Feyza Elif Dial, PhD student, Yıldız Technical University, Istanbul, co-advisor with Yusuf Zeren, 2023 to present.
- Jacob Glidewell, Masters student, 2023 to 2024.
- Troy Roberts, Masters student, 2022 to 2023.
- Michael Penrod, PhD student, 2020 to present.
- John-Oliver MacLellan, PhD student, 2017 to 2022.
- Jeremy Cummings, Masters student, 2019 to 2020.

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Dissertation Committees and External Reviews

- Habilitation Committee, Lenka Slavíková, Charles University, Prague, 2024 to present.
- Dissertation Committee, Adam Mair, 2022 to 2024.
- Dissertation Committee, Steven Redolfi, UAB, 2022 to 2023.
- Dissertation pre-examiner, Julian Weight, University of Helsinki, August 2022.
- Dissertation committee, Khalid Said, University of Alabama, 2019 to 2022.
- Dissertation committee, Quan Tran, University of Alabama, 2019 to 2022.
- Dissertation committee, Jesús Ocáriz Gallego Universidad Autonoma de Madrid, 2020.
- Dissertation committee, Xuan Wang, University of Alabama, 2019-2020.
- Dissertation committee, Maria Cruz Prisuelos, Universidad Autonoma de Madrid, 2016-17. (Defense, April 2017.)
- Dissertation committee, Laura Erin Watley, University of Alabama, 2015-2017.
- Dissertation committee, Cong Hoang, University of Alabama, 2016-2017.
- External reviewer, dissertation proposal, Oscar M. Guzman, Universidad Nacional de Colombia, December 2016.
- Opponent, dissertation defense of Olli Tapiola, University of Helsinki, May 2016.
- Dissertation committee, Theresa C. Anderson, Brown University, 2015.
- Dissertation pre-examiner, Anna Kairema, University of Helsinki, March 2013.

Graduate Research Supervised

- 2023 to 2024: Masters thesis, Jacob Glidewell, *The Ross-Darboux-Stieltjes integral*.
- 2022 to 2023: Masters thesis, Troy Roberts, *Necessary conditions for bounded fractional maximal and operators and fractional singular integral operators on variable Lebesgue spaces*.
- 2022 to 2023: Research project, Michael Penrod, *Convolution operators in matrix weighted variable Lebesgue spaces*.
- 2021 to 2022: Research project, Michael Penrod, *The dyadic ϵ -maximal operator on variable Lebesgue spaces*.
- 2020 to 2022: PhD dissertation, John Oliver MacLellan, *Necessary conditions for two weight, weak type inequalities for multilinear singular integrals*.
- 2020 to 2021: Research project, Michael Penrod, *Poincaré inequalities and Neumann problems for the variable exponent setting*.
- 2018 to 2020: Research project, John Oliver MacLellan, *Necessary conditions for weak type inequalities for Calderón-Zygmund operators*.
- 2019 to 2020: Masters thesis, Jeremy Cummings, *Weighted norm inequalities for the maximal operator on variable Lebesgue spaces over spaces of homogeneous type*.
- Spring 2019: Research project, Quan Tran, *The Hardy-Littlewood maximal operator*.
- Fall 2017: Research project, Eduard Roure Perdices (Universidad de Barcelona), *Restricted weak type extrapolation*.

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- 2016-17: Research project, Oscar M. Guzman (Universidad Nacional de Colombia), *Topics in variable Lebesgue spaces*.
- 2016: Independent study, Liet Vo, *Two weight inequalities for fractional integrals and commutators*.

Undergraduate Research Supervised

- 2022-2023: Undergraduate research project, Jacob Glidewell, *Generalized Darboux-Stieltjes integrals*.
- 2018-19: Undergraduate research project, Philip Speegle, *Volume of the n dimensional sphere in rectilinear coordinates*.
- 2015: Independent Study, Greg Convertito, *Lebesgue measure and integral*.
- 2014-15: Senior Honors Thesis, Philip Cho, *Sturm-Liouville theory*.
- 2014: Independent Study, Philip Cho, *Lebesgue measure and integral*.
- 2013-14: Interdisciplinary Science Program Independent Research, Greg Convertito, *An elementary calculus problem with surprising connections to number theory; p -hyperbolic trig functions*.
- 2013: Independent Study, Philip Cho, *Introductory harmonic analysis*.
- 2012: Independent Study, Greg Vaughan, *Nowhere differentiable functions on the real line*.
- 2010: Senior Honors Thesis, Adam Wright, *The Kalman filter: the optimal linear estimator*.
- 2008: Senior Honors Thesis, Haley Lepo, *Numerical evidence for the Muckenhoupt conjecture*.
- 2005: Interdisciplinary Science Program Independent Research, Leighann Kinter, Lisa Pham, *Classifying cubic equations*.
- 2004: Interdisciplinary Science Program Independent Research, James Piette, *Monte Carlo analysis of poker hands*.
- 2002: Interdisciplinary Science Program Independent Research, Daniel Fitch, *Computing the maximal operator*.

Teaching Experience

Calculus, elementary differential equations, introduction to proof, elementary statistics, real analysis, measure theory, Fourier analysis, partial differential equations, foundations of mathematics.

Trinity First Year Program Seminars

- 2007, 2009, 2012: Rich and Poor, White and Colored: Race and Class in the U.S. and Trinity College.
- 2004: Imagining Heaven and Hell: Utopia and Dystopia in Literature and Film.
- 2001: The Radical Christian Ideal.
- 2000: Radical Christian Poverty.

Diversity Activities

- Southeast Regional Math Alliance Steering Committee, 2023 to present.

- LFSA, Faculty & Staff Development Committee, 2021 to present.
- Founding member, Latinx Faculty Staff Association, University of Alabama, 2019.
- Winner, College of Arts & Sciences Dean's Diversity Award, 2019.
- Discussion participant, *Women in mathematics*, AWM Student Chapter, Purdue University (in conjunction with the Diversity in Mathematics workshop), February 14, 2019.
- Panelist, *Moving up the academic ladder*, Latinx in Mathematics, IPAM, March 10, 2018.
- First year seminar topics on race and class: 2007, 2009, 2012.
- Invited speaker, Classical Magnet School, Hartford, 2008.
- Mentor, New England Board of Higher Education Science Network, 1999–2005.
- Invited speaker, Classical Magnet Program (Quirk Middle), 1998 to 2004.
- Trinity College Retention Team, 1998–2002.
- Invited speaker, Classical Magnet Program (Hartford Public High), December 1997, Spring 2002.
- Volunteer instructor, Minority Middle School Summer Science Program, Purdue School of Science, Summer 1994, 1995.
- MARC/AIM application review committee, Purdue, 1994.
- Member, Berkeley Mathematics Opportunity Committee, 1990-1993.
- Instructor, Mathematics Opportunity Committee preliminary examination workshop, Berkeley, 1990-1992.

Research Interests

Harmonic analysis, especially weighted norm inequalities and extrapolation theory, variable Lebesgue spaces, applications of harmonic analysis to PDEs

Research Publications

- (1) *Weighted weak-type inequalities for maximal operators and singular integrals*, Rev. Mat. Complut., to appear. (Joint with B. Sweeting.)
- (2) *Convolution operators in matrix weighted variable Lebesgue spaces*, Anal. Appl., to appear. (Joint with M. Penrod.)
- (3) *A characterization of weighted Sobolev spaces via weighted Riesz bounded variation spaces*, Studia Math., 274 (2024), 3, 287–304. (Joint with O. Guzmán and H. Rafeiro.)
- (4) *Hardy-Leray inequalities in variable Lebesgue spaces*, J. Math. Anal. Appl., 530 (2024), 2, paper no. 127747. (Joint with D. Suragan.)
- (5) *Bounded weak solutions to elliptic PDE with data in Orlicz spaces*, Methusalem Lectures Volume, Ghent Analysis and PDE Center, Research Perspectives, Trends in Mathematics 3, Birkhäuser/Springer, 2024.
- (6) *Matrix weights, singular integrals, Jones factorization and Rubio de Francia extrapolation*, RIMS Kôkyûroku (Kyoto University), no. 2256, June 2023.
- (7) *The ϵ -maximal operator and Haar multipliers on variable Lebesgue spaces*, Math. Inequal. Appl., 25 (2023), 3, 685–701. (Joint with M. Penrod.)

- (8) *The Stieltjes Integral*, CRC Press, Boca Raton, FL, 2023. (Joint with G. Convertito.)
- (9) *A note on the limit of Orlicz norms*, *Real Anal. Exchange*, 48 (2023), 1, 77–82. (Joint with S. Rodney.)
- (10) *Erratum: Kato-Ponce inequalities on weighted and variable Lebesgue spaces*, *Differential Integral Equations* 35 (2022), 7–8, 473–480. (Joint with V. Naibo.)
- (11) *New oscillation classes and two weight bump conditions for commutators*, *Collect. Math.* 74 (2023), 225–246. (Joint with K. Moen and Q. Tran.)
- (12) *Poincaré inequalities and Neumann problems for the variable exponent setting*, *Math. Eng.* 4 (2022), 5. (Joint with M. Penrod and S. Rodney.)
- (13) *Bounded weak solutions to elliptic PDE with data in Orlicz spaces*, *J. Diff. Equations*, 297 (2021), 409–432. (Joint with S. Rodney.)
- (14) *Weighted norm inequalities for maximal operators on variable Lebesgue spaces over spaces of homogeneous type*, *Ann. Acad. Sci. Fenn. Math.* 47 (2022) 1, 457–488. (Joint with J. Cummings.)
- (15) *Necessary conditions for two weight inequalities for singular integral operators*, *Studia Math.*, 261 (2021), 2, 187–205. (Joint with J.O. MacLellan.)
- (16) *Weak endpoint bounds for matrix weights*, *Rev. Mat. Iberoamericana*, 37 (2021), 4, 1513–1538. (Joint with J. Isralowitz, K. Moen, I. Rivera-Ríos and S. Pott.)
- (17) *Multilinear multipliers and singular integrals with smooth kernels on Hardy spaces*, *Trans. Amer. Math. Soc.*, 374 (2021), 6, 3801–3825. (Joint with H. Nguyen.)
- (18) *Weighted norm inequalities for the bilinear maximal operator on variable Lebesgue spaces*, *Publ. Mat.*, 64 (2020), 2, 453–498. (Joint with O.M. Guzman.)
- (19) *Weighted Riesz bounded variation spaces and the Nemytskii operator*, *Azerbaijan J. Math.*, 10 (2020), 2. (Joint with O. M. Guzmán and H. Rafeiro.)
- (20) *Global Sobolev inequalities and degenerate p -Laplacian equations*, *J. Diff. Equations*, 268 (2020), 10, 6189–6210. (Joint with S. Rodney and E. Rosta.)
- (21) *A new approach to norm inequalities on weighted and variable Hardy spaces*, *Ann. Acad. Sci. Fenn. Math.*, 45 (2020) 1, 175–198. (Joint with K. Moen and H. Nguyen.)
- (22) *A multilinear reverse Hölder inequality with applications to multilinear weighted norm inequalities*, *Georgian Math. J.*, 27 (2020), 1, 37–42. (Joint with K. Moen.)
- (23) *The Calderón operator and the Stieltjes transform on variable Lebesgue spaces with weights*, *Collect. Math.*, (2019). (Joint with E. Dalmasso, F. J. Martín-Reyes, and P. Ortega Salvador.)
- (24) *The boundedness of multilinear Calderón-Zygmund operators on weighted and variable Hardy spaces*, *Publ. Mat.* 63 (2019), 2, 679–713. (Joint with K. Moen and H. Nguyen.)
- (25) *Multilinear fractional Calderón-Zygmund singular integrals on Hardy spaces*, *Houston J. Math.*, 45 (2019), 3, 853–872. (Joint with K. Moen and H. Nguyen.)
- (26) *Sharp A -harmonic approximations*, *Appl. Anal.* 98 (2019), 1–2, 374–380. (Joint with L. Diening.)

- (27) *Two weight bump conditions for matrix weights*, Integral Equations Operator Theory 90 (2018), 3, Art. 36. (Joint with J. Isralowitz and K. Moen.)
- (28) *A modular variable Orlicz inequality for the local maximal operator*, Georgian Math. J. 25 (2018), 2, 201–206. (Joint with C. Capone and A. Fiorenza.)
- (29) *Modular inequalities for the maximal operator in variable Lebesgue spaces*, Nonlinear Anal, 177 (2018), part A, 299–311. (Joint with G. Di Fratta and A. Fiorenza.)
- (30) *Limited range multilinear extrapolation with applications to the bilinear Hilbert transform*, Math. Ann. 371 (2018), 1–2, 615–653. (Joint with J.M. Martell.)
- (31) *Extrapolation in the scale of generalized reverse Hölder weights*, Rev. Mat. Complut. 31 (2018), 2, 263–286. (Joint with T. Anderson and K. Moen.)
- (32) *Remembering Don Sarason (1933-2017)*, Notices AMS, 65 (2018), 2, 195–200. (Joint with S.-Y. Chang, J. Doyle, S. Garcia.)
- (33) *Poincaré inequalities and Neumann problems for the p -Laplacian*, Canad. Math. Bull, 61 (2018), 4, 738–753. (Joint with S. Rodney and E. Rosta.)
- (34) *On the Kato problem and extensions for degenerate elliptic operators*, Anal. PDE, 11 (2018), 3, 609–660. (Joint with J.M. Martell and C. Rios.)
- (35) *Extrapolation and interpolation in generalized Orlicz spaces*, Trans. Amer. Math. Soc., 370 (2018), 6, 4323–4349. (Joint with P. Hästö.)
- (36) *The boundedness of fractional maximal operators on variable Lebesgue spaces over spaces of homogeneous type*, Studia Math. 242 (2018), 2, 109–139. (Joint with P. Shukla.)
- (37) *Necessary conditions for the boundedness of linear and bilinear commutators on Banach function spaces*, Math. Inequal. Appl. 21 (2018), 1, 1–16. (Joint with L. Chaffee.)
- (38) *Extrapolation and factorization*, in *Function Spaces, Embeddings and Extrapolation X, Paseky 2017*, J. Lukeš and L. Pick eds., Matfyzpress, Charles University, Prague, 2017, 45–92.
- (39) *Embeddings of grand Lebesgue spaces, small Lebesgue spaces and Lebesgue spaces with a variable exponent*, Math. Notes, 102 (2017), 5-6, 677–686. (Joint with A. Fiorenza and O.M. Guzman.)
- (40) *Two weight norm inequalities for fractional integral operators and commutators*, Advanced Course of Mathematical Analysis VI: Proceedings of the 6th International Course of Mathematical Analysis in Andalucía, F. J. Martin-Reyes, ed., World Scientific, 2017.
- (41) *Elementary proofs of one weight norm inequalities for fractional integral operators and commutators*, Harmonic Analysis, Partial Differential Equations, Complex Analysis, Banach Spaces, and Operator Theory, Celebrating Cora Sadosky’s life. Vol. 2. M. C. Pereyra, S. Marcantognini, A. Stokolos, W. Urbina, eds., AWM-Springer Series, Springer, 2 (2017), 183–198, Assoc. Women Math. Ser., 5, Springer, Cham, 2017.
- (42) *Extrapolation and weighted norm inequalities in variable Lebesgue spaces*, Trans. Amer. Math. Soc, 369 (2017), 2, 1205–1235. (Joint with L. Wang.)
- (43) *A note on the off-diagonal Muckenhoupt-Wheeden conjecture*, Advanced Courses in Mathematical Analysis V: Proceedings of the Fifth International School, J. Carlos, N. Pascual, E. A. Kaidi, eds., World Scientific, 2016, 244–252. (Joint with J.M. Martell and C. Pérez.)

- (44) *Kato-Ponce inequalities on weighted and variable Lebesgue spaces*, Differential Integral Equations, 29 (2016), 9–10, 801–836. (Joint with V. Naibo.)
- (45) *Building the biggest box: three-factor polynomials and a Diophantine equation*, Math. Mag., 89 (2016), 3, 201–211. (Joint with G. Convertito.)
- (46) *Greedy bases in variable Lebesgue spaces*, Monatsh. Math., 2016, 179(3), 355–378. (Joint with E. Hernandez and J.M. Martell.)
- (47) *Matrix A_p weights, degenerate Sobolev spaces, and mappings of finite distortion*, J. Geom. Anal., 26 (2016), 4, 2797–2830. (Joint with K. Moen and S. Rodney.)
- (48) *Regularity results for weak solutions of elliptic PDEs below the natural exponent*, Ann. Mat. Pura Appl., (4) 195 (2016), 3, 725–740. (Joint with K. Moen, and S. Rodney.)
- (49) *Convergence in measure of approximate identities in variable Lebesgue spaces*, Anal. Appl. (Singap.), 13 (2015), 4, 413–418. (Joint with A. Fiorenza.)
- (50) *Logarithmic bump conditions for Calderón-Zygmund operators on spaces of homogeneous type*, Publ. Mat., 59, 1 (2015), 17–43. (Joint with T.C. Anderson and K. Moen.)
- (51) *Variable Lebesgue Spaces and Hyperbolic Systems*, Advanced Courses in Mathematics, CRM Barcelona, Birkhauser, Basel, 2014. (Joint with A. Fiorenza, M. Ruzhansky, J. Wirth.)
- (52) *Errata to “Gaussian bounds for degenerate parabolic equations” [J. Funct. Anal. 255 (2008), no. 2, 283–312]*, J. Funct. Anal. 267 (2014), no. 9, 3507–3513. (Joint with C. Rios.)
- (53) *Variable Hardy spaces*, Indiana Univ. Math. J. 63, 2 (2014), 447–493. (Joint with D. Wang.)
- (54) *The Kato problem for operators with weighted ellipticity*, Trans. Amer. Math. Soc., 367 (2015), 7, 4727–4756. (Joint with C. Rios.)
- (55) *Logarithmic bump conditions and the two-weight boundedness of Calderón-Zygmund operators*, Adv. Math. 255 (2014), 706–729. (Joint with A. Reznikov and A. Volberg.)
- (56) *A fractional Muckenhoupt-Wheeden theorem and its consequences*, Integr. Equ. Oper. Theory 76 (2013), 421–446. (Joint with K. Moen.)
- (57) *Regularity of solutions to degenerate p -Laplacian equations*, J. Math. Anal. Appl. 401 (2013), 1, 458–478. (Joint with K. Moen and V. Naibo.)
- (58) *One and two weight norm inequalities for Riesz potentials*, Illinois J. Math., 57 (2013), 1, 295–323. (Joint with K. Moen.)
- (59) *Weighted norm inequalities for the maximal operator on variable Lebesgue spaces*, J. Math. Anal. Appl. 394 (2012), 2, 335–367. (Joint with A. Fiorenza and C.J. Neugebauer.)
- (60) *Variable Lebesgue Spaces: Foundations and Harmonic Analysis*, Birkhauser, Applied and Numerical Harmonic Analysis, 2013. (Joint with A. Fiorenza.)
- (61) *Interpolation of positive operators on variable Lebesgue spaces*, Math Inequal. Appl., 15 (2012), 3, 639–644.
- (62) *Sharp weighted estimates for classical operators*, Adv. Math., 229 (2012), 1, 408–441. (Joint with J.M. Martell and C. Pérez.)
- (63) *Sharp norm inequalities for commutators of classical operators*, Publ. Mat., 56 (2012) 1, 147–190. (Joint with K. Moen.)

- (64) *On the continuity of minimizers for quasilinear functionals*, Czechoslovak Math. J., 62(137) (2012), 1, 111–116. (Joint with P. Di Gironimo and L. D’Onofrio.)
- (65) *On a general weighted Hardy type inequality in the variable exponent Lebesgue spaces*, Rev. Mat. Univ. Complut. Madrid, 25 (2012), 2, 335-367. (Joint with F. Mamedov.)
- (66) *The maximal operator on weighted variable Lebesgue spaces*, Frac. Calc. Appl. Anal., 14 (3), 2011, 361-374. (Joint with L. Diening and P. Hästö.)
- (67) *On the continuity of solutions to degenerate elliptic equations*, J. Diff. Eq. 250 (2011), 6, 2671–2686. (Joint with C. Sbordone and P. Di Gironimo.)
- (68) *The solution of the Kato problem for degenerate elliptic operators with Gaussian bounds*, Trans. Amer. Math. Soc., 364 (2012), 7, 3449-3478. (Joint with C. Rios.)
- (69) *Convergence in variable Lebesgue spaces*, Publ. Mat. 54(2) (2010), 441-459. (Joint with A. Fiorenza.)
- (70) *Sharp weighted estimates for approximating dyadic operators*, Electron. Res. Announc. Math. Sci. 17, 2010. (Joint with J.M. Martell and C. Pérez.)
- (71) *Weights, Extrapolation and the Theory of Rubio de Francia, Operator Theory: Advances and Applications*, Birkhauser, Basel, 2011. (Joint with J.M. Martell and C. Pérez.)
- (72) *A new proof of the boundedness of maximal operators on variable Lebesgue spaces*, Boll. Unione Mat. Ital. (9) 2 (2009), no. 1, 151–173. (Joint with L. Diening and A. Fiorenza.)
- (73) *$L \log L$ results for the maximal operator in variable L^p spaces*, Trans. Amer. Math. Soc. 361 (2009), 2631-2647. (Joint with A. Fiorenza.)
- (74) *The structure of increasing weights on the real line*, Houston J. Math. 34 (2008), 3, 951-983. (Joint with L. Forzani and D. Maldonado.)
- (75) *Gaussian bounds for degenerate parabolic equations*, J. Funct. Anal. 255 (2008), 283–312. (Joint with C. Rios.)
- (76) *Sharp two-weight inequalities for singular integrals, with applications to the Hilbert transform and the Sarason conjecture*, Adv. Math. 216 (2007), 2, 647–676. (Joint with J.M. Martell and C. Pérez.)
- (77) *The Fractional maximal operator on variable L^p spaces*, Rev. Mat. Iberoamericana 23 (2007), 3, 743-770. (Joint with C. Capone and A. Fiorenza.)
- (78) *Approximate identities in variable L^p spaces*, Math. Nach. 280 (2007), 256-270. (Joint with A. Fiorenza.)
- (79) *Weighted endpoint estimates for commutators of fractional integrals*, Czech. Math. J. 57 (2007), 153–160. (Joint with A. Fiorenza.)
- (80) *Extensions of Rubio de Francia’s extrapolation theorem*, Proceedings of El Escorial, 2004, Collect. Math. (2006) 1-37. (Joint with J.M. Martell and C. Pérez.)
- (81) *The boundedness of classical operators on variable L^p spaces*, Ann. Acad. Sci. Fenn. Math. 31 (2006), 239-264. (Joint with A. Fiorenza, J.M. Martell and C. Pérez.)
- (82) *Weighted weak-type inequalities and a conjecture of Sawyer*. Int. Math. Res. Not. 30 (2005), 1849–1871. (Joint with J.M. Martell and C. Pérez.)

- (83) *Extrapolation from A_∞ weights and applications*, J. Funct. Anal. 213 (2004), 412-439. (Joint with J.M. Martell and C. Pérez.)
- (84) *The maximal function on variable L^p spaces*, Ann. Acad. Sci. Fenn. Math. 28 (2003), 223-238, and 29 (2004), 247-249. (Joint with A. Fiorenza and C.J. Neugebauer.)
- (85) *Endpoint estimates and weighted norm inequalities for commutators of fractional integrals*, Publ. Mat. 47 (2003), 103-131. (Joint with A. Fiorenza.)
- (86) *The Hardy-Littlewood maximal operator on variable- L^p spaces*, Seminar of Mathematical Analysis (Malaga/Seville, 2002/2003), 147-156, Colecc. Abierta, 64 Univ. Sevilla Secr. Publ., Seville, 2003.
- (87) *An elementary proof of error estimates for the trapezoidal rule*, Math. Mag. 76 (2003), 303-306.
- (88) *On the two-weight problem for singular integral operators*, Ann. Scuola Norm. Sup. Pisa Cl. Sci. (5) Vol. I (2002), 821-849. (Joint with C. Pérez.)
- (89) *Sharp error bounds for the trapezoidal rule and Simpson's rule*, J. Ineq. Pure Appl. Math. 3, Issue 4 (2002), Article 49. (Joint with C.J. Neugebauer.)
- (90) *Localization and extrapolation in Lorentz-Orlicz spaces*, Function Spaces, Interpolation Theory and Related Topics, M. Cwikel *et al.* Eds., de Gruyter, Berlin, 2002, 273-284. (Joint with M. Krbeć.)
- (91) *The A_∞ property for Young functions and weighted norm inequalities*, Houston J. Math. 28 (2002), 169-182. (Joint with A. Fiorenza.)
- (92) *A new proof of weighted weak-type inequalities for fractional integrals*, Comment. Math. Univ. Carolinae, 42 (2001), 481-485.
- (93) *The minimal operator and the geometric maximal operator in \mathbb{R}^n* , Studia Math. 144 (2001), 1-37.
- (94) *New proofs of two-weight norm inequalities for the maximal operator*, Georgian Math. J. 7 (2000), 33-42.
- (95) *Fourier Analysis*, translation and revision of the Spanish edition by Javier Duoandikoetxea, Amer. Math. Soc., Providence, December, 2000.
- (96) *Two-weight, weak-type norm inequalities for fractional integrals, Calderón-Zygmund operators and commutators*, Indiana Math. J. 49 (2000), 697-722. (Joint with C. Pérez.)
- (97) *Two weight extrapolation via the maximal operator*, J. Funct. Anal. 174 (2000), 1-17. (Joint with C. Pérez.)
- (98) *Sharp two-weight, weak-type norm inequalities for singular integral operators*, Math. Res. Let. 6 (1999), 417-427. (Joint with C. Pérez.)
- (99) *Weighted norm inequalities for geometric fractional maximal operators*, J. Fourier Anal. Appl. 5 (1999), 45-66. (Joint with C.J. Neugebauer and V. Olesen.)
- (100) *Weighted norm inequalities for the centered maximal operator on \mathbb{R}^+* , Recherche di Mat. 48 (1999), 225-241. (Joint with C.J. Neugebauer.)
- (101) *Weighted norm inequalities for the geometric maximal operator*, Publ. Mat. 42 (1998), 239-263. (Joint with C.J. Neugebauer.)

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- (102) *The class $A_{\infty}^{+}(g)$ and the one-sided reverse Hölder inequality*, Canadian Bulletin Math. 40 (1997), 169-173.
- (103) *A new proof of the two weight norm inequality for the one-sided fractional maximal operator*, Proc. Amer. Math. Soc. 125 (1997), 1419-1424.
- (104) *Weighted norm inequalities for a family of one-sided minimal operators*, Illinois J. Math. 41 (1997), 77-92. (Joint with C. J. Neugebauer and V. Olesen.)
- (105) *Norm inequalities for the minimal and maximal operator, and differentiation of the integral*, Publ. Mat. 41 (1997), 577-604. (Joint with C. J. Neugebauer and V. Olesen.)
- (106) *The relation between the root and ratio tests*, Math. Mag. 70 (1997), 214-215.
- (107) *Piecewise monotonic doubling measures*, Rocky Mtn. J. Math. 26 (1996), 2, 1-39. (Published version of dissertation.)
- (108) *The one-sided minimal operator and the one-sided reverse Hölder inequality*, Studia Math. 116 (1995), 255-270. (Joint with C. J. Neugebauer and V. Olesen.)
- (109) *The structure of the reverse Hölder classes*, Trans. Amer. Math. Soc. 347 (1995), 2941-2960. (Joint with C. J. Neugebauer.)
- (110) *The invertibility of the product of unbounded Toeplitz operators*, Integral Equations Operator Theory 20 (1994), 231-237.
- (111) *Prelim Workshop Lecture Notes*, Berkeley Mathematics Lecture Notes 5, 1993.
- (112) *The class $L \log L$ with weights*, The Madison Symposium on Complex Analysis, Contemporary Mathematics, vol. 137, AMS, Providence, 1992.

Work in Progress

- (1) *Extrapolation and Factorization of matrix weights*, submitted. (Joint with M. Bownik.)
- (2) *Degenerate parabolic p -Laplacian equations: existence, uniqueness and asymptotic behavior of solutions*, submitted. (Joint with K. Moen and Y. Shao.)
- (3) *The Ross-Darboux-Stieltjes integral*, submitted. (Joint with J. Glidewell.)
- (4) *On the embedding between the variable Lebesgue space $L^{p(\cdot)}(\Omega)$ and the Orlicz space $L(\text{Log}L)^{\alpha}(\Omega)$* , submitted. (Joint with A. Gogatishvili and T. Kopaliani.)
- (5) *Necessary conditions for the boundedness of fractional operators on variable Lebesgue spaces*, in preparation. (Joint with T. Roberts.)
- (6) *Poincaré-type inequalities with variable exponents and the log-Hölder condition only on the boundary*, in preparation. (Joint with F. López-García and I. Ojea.)
- (7) *On the dual of variable Lebesgue spaces with unbounded exponent*, under revision. (Joint with A. Amenta, J. Conde-Alonso and J. Ocariz.)
- (8) *Necessary conditions for two weight, weak type norm inequalities for multilinear singular integrals*, in preparation. (Joint with J. O. MacLellan.)
- (9) *The structure of weights in variable Lebesgue spaces*, in preparation. (Joint with L. Wang.)
- (10) *Separated bump conditions for fractional Bergman operators*, in preparation. (Joint with B. Hu.)

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- (11) *Restricted weak type inequalities for fractional and singular integral operators and commutators*, in preparation. (Joint with E. Roure.)
- (12) *Multilinear Calderón-Zygmund operators with different decays on the derivatives*, in preparation. (Joint with K. Moen and H. Nguyen.)
- (13) *Boundary value problems with data in variable Lebesgue spaces*, in preparation. (Joint with J. M. Martell.)

Grants and Awards

- National Science Foundation ACCEPT training grant, co-PI, NRT grant DGE-2244074, 2023–2028.
- Simons Foundation Collaboration Grants for Mathematicians, 2023–2027.
- College of Arts & Sciences Dean’s Diversity Award, 2019.
- Fulbright OLF visiting scholar award to host Alexey Karapetyants, December 2018.
- National Science Foundation research grant DMS-1362425, 2014–2018.
- Ministerio de Ciencias e Innovacion, Spain, foreign investigator on research grant MTM2012-30748, 2012–2015.
- Ministerio de Ciencias e Innovacion, Spain, foreign investigator on research grant MTM2009-08934, 2009-2012.
- Trinity College Faculty Research Committee, Summer Research Grant, 2009.
- Consejeria de Innovacion, Ciencia y Empresa of the Junta de Andalucia, Spain, research grant, Summer, 2009.
- Consiglio Nazionale delle Ricerche, Italy, research grant, January, 2009.
- Trinity College Stewart-Dowart Faculty Development Fund, 2000-2015.
- Ford Foundation Minority Postdoctoral Fellowship, 1998-1999.
- National Science Foundation Minority Graduate Fellowship, 1989-1992.
- Academic Junior Marshal, University of Chicago, 1985.
- Phi Beta Kappa, University of Chicago chapter, 1984.

Short Courses

- 2024 *Variable Lebesgue spaces*, invited lecture series (8 lectures), NOVA School of Science and Technology, Lisbon, Portugal.
- 2023 *Young functions, Orlicz spaces, and applications to PDEs*, invited lecture series (3 lectures), Yıldız Technical University, Istanbul, Turkey.
- 2022 *Jones factorization and Rubio de Francia extrapolation for matrix weights*, invited lecture series (two lectures), Conference on Research on Real, Complex and Functional Analysis, Kyoto, Japan.
- 2022 *Factorization and extrapolation*, invited lecture series (five lectures), Yıldız Technical University, Istanbul, Turkey.
- 2019: *Recent progress in harmonic analysis*, two invited lectures, Beijing Normal University, China.

- 2018: *Extrapolation and factorization*, invited lecture series, UNEMAT5, Un Encuentro de Matemáticas, UNAL, Bogota, Colombia.
- 2017: *Extrapolation and factorization*, four lecture short course, Paseky Spring School on Analysis, Czech Republic.
- 2014: *Two-weight norm inequalities for fractional integral operators and commutators*, short course at the 6th International Course of Mathematical Analysis in Andalucía, Antequera, Spain.
- 2013: *Variable Lebesgue spaces*, short course, ICMAT trimester on harmonic analysis, Madrid.
- 2011: *Variable Lebesgue spaces*, Advanced courses in mathematics, CRM, Barcelona.
- 2010: *Variable Lebesgue spaces*, three lecture short course, Harmonic Analysis and Related Topics: international summer school and workshop, Lisbon.
- 2007: *Variable Lebesgue spaces*, six week lecture series, University of Naples, Italy.

Invited Talks

- 2024: Analysis seminar, Universidade de Aveiro, Portugal; Invited plenary lecture, SEAM 40, University of Florida, Gainesville;
- 2023: invited Zoom seminar, Ghent geometric analysis seminar; AMS special section on harmonic analysis, Cincinnati, OH; ICOMAA 2023, Istanbul, Turkey; Analysis seminar, Nazarbayev University, Kazakhstan; Workshop on Spectral Theory of Differential Operators, Nazarbayev University, Kazakhstan; mathematics colloquium, University of Alabama at Birmingham; Nonlinear analysis seminar, National Taiwan Normal University; Department of mathematics colloquium, National Taiwan Normal University.
- 2022: invited Zoom seminar, University of New Mexico analysis seminar; invited talk, ORAM 11 (Ohio River Analysis Meeting), University of Kentucky; ICOMAA 2022, Istanbul, Turkey; invited seminar talk, University of Malaga; invited main speaker, 11th meeting on harmonic analysis and PDES, El Escorial, Spain; invited short talk, LatMath Conference, IPAM, UCLA; invited lecture, XII International Conference of the GMU, Batumi, Georgia; invited Zoom lecture, NCTS Conference on Fractional Integrals and Related Phenomena in Analysis, Taiwan.
- 2021: AMS special session on sharp constant estimates in harmonic analysis (Zoom, Ohio); invited Zoom seminar, University of Coimbra, Portugal; invited Zoom lecture, Conference on Methods of Nonlinear Analysis in Differential and Integral Equations (MNA 2021), Poland; invited Zoom lecture, ICOMAA 2021, Istanbul, Turkey; invited conference talk, Canadian Math. Soc. Meeting; invited Zoom lecture, Prairie Analysis Seminar, Kansas State; UA Physics Colloquium.
- 2020: Colloquium talk, Purdue University; invited Zoom lecture, ICOMAA 2020, Istanbul, Turkey; analysis seminar talk (Zoom), IMAL, Santa Fe, Argentina; invited Zoom lecture, SFU Rostov, Russia; function space seminar talk (Zoom), Charles University, Prague, Czech Republic; nonstandard analysis seminar (Zoom), University of Warsaw, Poland.
- 2019: AMS special session on harmonic analysis and PDEs, Baltimore; analysis seminar talk, University of Tennessee, Knoxville; invited special lecture on extrapolation, workshop on diversity in mathematics, Purdue; invited talk, ICMAT, Madrid.

- 2018: analysis seminar, University of Oregon; invited talk, AMS special session on function spaces, operator theory, and non-linear differential operators, Columbus, Ohio; invited talk, ICMAT, Madrid.
- 2017: invited talk, AMS special session on function spaces, New York, NY; Colloquium talk, University of Memphis.
- 2016: Colloquium talk, University of Alabama, Birmingham; AMS special session on Bellman functions and sharp estimates, Athens, Georgia; AMS special session on harmonic analysis, Athens, Georgia. Joint Colloquium talk, University of Helsinki; invited talk, Workshop on Singular Integrals and Differential Equations, Helsinki; invited talk, X Forum on Partial Differential Equations, Bedlewo, Poland; analysis seminar, Aalto University, Helsinki.
- 2015: Analysis seminar, University of Oregon; analysis seminar, University of Naples (Faculty of Science); invited talk, special session on harmonic analysis, Congress of the RSME, Granada, Spain; AMS special session on harmonic analysis and applications, E. Lansing, Michigan; Colloquium talk, University of Vermont; analysis seminar, University of Alabama.
- 2014: Analysis seminar, Brown University; Trimester in Harmonic Analysis and PDEs, Hausdorff Institute, Bonn; Analysis seminar, Ludwig-Maximilians Universität, Munich; undergraduate colloquium, Cape Breton University, Nova Scotia; colloquium, SUNY Albany; analysis seminar, Michigan State University.
- 2013: Analysis seminar, Ohio State; Analysis seminar, Ludwig-Maximilians Universität, Munich; Invited lecture, ICMAT workshop on harmonic analysis, Madrid; undergraduate colloquium, Cape Breton University, Nova Scotia.
- 2012: Colloquium speaker, Baylor University; Colloquium speaker, University of Alabama; Southeastern Analysis Meeting (SEAM XXVIII); Colloquium speaker, Universidad de Malaga, Spain; Colloquium speaker, Universidad de Sevilla, Spain; AMS Special Session on Harmonic Analysis and Nonlinear PDEs, University of Akron; analysis seminar, Brown University.
- 2011: AMS Special session on harmonic analysis and partial differential equations, New Orleans; special session on harmonic analysis, Congress of the RSME, Avila, Spain; Conference in Harmonic Analysis and Partial Differential Equations in honour of Eric Sawyer, Toronto.
- 2010: University of Calgary; Special session on extrapolation and interpolation, Functional Analysis in Valencia, 2010; Harmonic Analysis and Applications: a conference in honor of the 70th birthday of Richard Wheeden, Sevilla; AMS Special Session on Harmonic Analysis, UCLA; analysis seminar, Brown University.
- 2009: University of Naples (Faculty of Science); AMS Special Session on Harmonic Analysis, Boca Raton.
- 2007: University of Calgary; AMS Special Session on Harmonic Analysis, Albuquerque.
- 2006: ICM Satellite Conference on harmonic analysis, Sevilla (Spain).
- 2005: Brown University.

- 2004: El Escorial Conference on Harmonic Analysis and Partial Differential Equations, Spain.
- 2003: Mathematical Institute of the Czech Academy of Sciences; Istituto de CNR, Naples, Italy.
- 2002: University of Naples (Faculty of Science); Functional Analysis Seminar, University of Sevilla.
- 2001: University of the Basque Country (Bilbao); New Mexico Analysis Seminar.
- 1999: New Mexico Analysis Seminar; Autonomous University of Barcelona; University of Naples (Faculty of Science); University of Naples (Faculty of Architecture); Mathematical Institute of the Czech Academy of Sciences.
- 1998: Brown University, Autonomous University of Madrid.
- 1997: Autonomous University of Madrid; University of Naples; SUNY Albany; Yale University; AMS special session on harmonic analysis (Albuquerque); Rutgers University.
- 1996: Howard University; Vassar College; Center of Communications Research–La Jolla; Williams College; University of Malaga.
- 1995: AMS special session on harmonic analysis (Burlington); University of California, Berkeley; New Mexico State; University of Malaga; Wabash Extra-mural Analysis Conference; University of Indiana; University of Chicago.
- 1994: Wabash Extra-mural Analysis Conference; Southeastern Analysis Meeting.

Conference and Workshop Organization

- Co-organizer, BIRS Workshop, *Boundary Regularity of Degenerate Elliptic Operators*, Banff Center, Banff, Canada, July 16-22, 2023.
- Co-organizer, *SEAM 35: Southeast Analysis Meeting*, University of Alabama, March 15-17, 2019.
- Co-organizer, *Advances in Harmonic Analysis and PDEs*, Canadian Math. Soc. Summer Meeting, Fredricton, June 1-4, 2018.
- Co-organizer, *Special Session on Function Spaces, Operator Theory, and Non-linear Differential Operators*, AMS sectional meeting, Columbus, Ohio, March 17-18, 2018.
- Co-organizer, *Special Session on Current Trends in Function Spaces and Nonlinear Analysis*, AMS sectional meeting, New York, New York, May 6-7, 2017.
- Organizing committee, *Nonstandard growth phenomena, 2017*, University of Turku, Finland, August 29-31, 2017.
- Co-organizer, *Special session on Recent Advances in Variable Exponent Spaces and Non-linear Problems*, Joint meeting of the AMS, EMS and the Portuguese Mathematical Society, Porto, Portugal, June 2015.
- Co-organizer, *Special session on advances in harmonic analysis and partial differential equations*, AMS sectional meeting, Halifax, Canada, October 2014.
- Co-organizer, *Special session on weighted norm inequalities and related topics*, AMS sectional meeting, Albuquerque, NM, April 2014.

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- Co-organizer, *Special Session on Harmonic Analysis and Partial Differential Equations*, AMS sectional meeting, Lawrence, KS, March 2012.
- Co-organizer, *Recent developments in elliptic and degenerate elliptic partial differential equations, systems, and geometric measure theory* Banff International Research Station, Banff, Canada, March 2008.
- Co-organizer, AMS special session on harmonic analysis, Williamstown, MA, October, 2001.

Editorial and Review Activities

- Associate Editor, *Potential Analysis*, 2019 to present.
- Language Editor, *Journal of Mathematics and Applications*, Poland, Aug. 2022 to present.
- Editorial Board, *Mathematical Sciences and Applications E-Notes Math. Sci. Appl. E-Notes*), Dec. 2020 to present.
- International Advisory Board, *Azerbaijan Journal of Mathematics*, 2018 to present.
- Editor, *Transactions of A. Razmadze Mathematical Institute*, 2016 to present.
- Editor, *Journal of Advances in Mathematical Analysis and Applications*, 2017 to present.
- Reviewer: multiple journals including *Advances in Mathematics*, *Analysis & PDEs*, *Bulletin of the London Math. Society*, *Houston Journal of Mathematics*, *Illinois Journal of Mathematics*, *Indiana University Journal of Mathematics*, *Integral Equations and Operator Theory*, *International Math Research Notices*, *Journal of Functional Analysis*, *Journal of Operator Theory*, *Mathematische Nachrichten*, *Math Research Letters*, *Potential Analysis*, *Proceedings of the AMS*, *Publicacions Matemàtiques*, *Revista Matemática Complutense*, *Revista Matemática Iberoamericana*, *Studia Mathematica*, *Transactions of the AMS*.

Prior Administrative Experience (Trinity College)

- Departmental Calculus Review, September 2012 to June 2014.
- Departmental Statistics Review, April 2011 to May 2012.
- Chairman, Department of Mathematics, July 2008 to June 2010.
- College Appointments and Promotions Committee, 2007-2009.
- Faculty Parliamentarian, 2001-2008.
- College Academic Affairs Committee, 2001-2004. Chairman, 2003-2004.
- Committee on Academic Standards and Excellence; 1999-2001. Chairman, 2000-2001.

Additional Professional Activities

- Panelist, NSF proposal review panel, February 2022.
- Co-Chair, University of Alabama United Way campaign, 2019.
- Hosted graduate student Eduard Roure Perdices from Barcelona, Spain, Fall 2017.
- Invited participant, AIM Workshop, *Sparse domination of singular integral operators*, October 2017.
- Hosted graduate student Oscar M. Guzman from Colombia, 2016–17.

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- Panelist, NSF proposal review panel, February 2015.
- Supervised talk on undergraduate research by Greg Convertito at MathFest, July 2013. (Greg awarded certificate for outstanding presentation by MAA.)
- Invited participant, AIM Workshop, *Weighted singular integral operators and non-homogenous harmonic analysis*, October 2011.
- Research adjunct, Institute for Defense Analysis, CCR-LaJolla, Summer 1998, 2001.

Public Service Activities

- Regional Executive Council, Brothers and Sisters of St. Francis Region, Secular Franciscan Order, August 2019 to present.
- Board of Directors, Theatre Tuscaloosa, September 2021 to present.
- Finance Council, St. Francis of Assisi Church, Bessemer, AL, March 2023 to present.
- Board of Directors, Consistent Life Network, August 2019 to June, 2023.

Other Information

- Read and speak (to a limited degree): Italian, Spanish, French.
- Professed lay brother, Secular Franciscan Order.