

CONTACT INFORMATION	<p>225 Stanger Street. Department of Mathematics, McBryde Hall 570, Virginia Tech. Blacksburg, VA 24061-1026, USA Honduran. Born in April 17, 1993 https://sites.google.com/site/joseramonmadridpadilla</p> <p style="text-align: right;">josemadrid@vt.edu</p>
RESEARCH INTERESTS	<p>Classical Harmonic analysis and its connections to number theory, combinatorics, probability, ergodic theory and PDEs. More specifically: regularity of maximal operators on Sobolev spaces, discrete analogues in harmonic analysis, Collatz conjecture, decoupling inequalities, optimal constants for classical inequalities in Fourier analysis, Roth type theorems and additive combinatorics.</p>
APPOINTMENTS	<p>Virginia Tech - Virginia Polytechnic Institute and State University, (USA). Assistant Professor (Tenure track). 2023 -</p> <p>University of Geneva, (Switzerland). Senior Researcher & Teaching Assistant. 2022 - 2023. Mentors: Stanislav Smirnov and Aleksandr Logunov</p> <p>UCLA - University of California Los Angeles, (USA). Hedrick Assistant Adjunct Professor. 2018 - 2022. Mentor: Terence Tao.</p> <p>ICTP - The Abdus Salam International Centre for Theoretical Physics (Trieste, Italy). Postdoctoral Researcher. 2017 - 2018.</p> <p>Aalto University, School of Science, Department of Mathematics and Systems Analysis (Helsinki, Finland). Visiting Postdoctoral Researcher. 2016 - 2017. Mentor: Juha Kinnunen.</p>
EDUCATION	<p>Ph.D. in Mathematics. March 2012 - March 2016.</p> <ul style="list-style-type: none"> • IMPA - Instituto de Matemática Pura e Aplicada (Brazil). • Thesis: Regularity of fractional maximal functions and extremal functions of exponential type. • Advisor: Emanuel Carneiro. <p>Master in Mathematics. March 2010 - February 2012.</p> <ul style="list-style-type: none"> • IMPA - Instituto de Matemática Pura e Aplicada (Brazil). • Advisor: Alfredo Iusem <p>Bachelor in Mathematics.</p> <ul style="list-style-type: none"> • UFRJ - Universidade Federal do Rio de Janeiro (Brazil).
RESEARCH PUBLICATIONS	<ol style="list-style-type: none"> 1. S. Dasu, H. Jung, Z. Li and J. Madrid, <i>Mixed norm ℓ^2 decoupling for paraboloids</i>, preprint submitted (2023). 2. D. Beltran, P. Ivanisvili and J. Madrid, <i>On sharp isoperimetric inequalities on the hypercube</i>, preprint submitted (2023). 3. J. De Dios, P. Ivanisvili and J. Madrid, <i>A new proof of the description of the convex hull of space curves with totally positive torsion</i>, preprint submitted (2023).

4. J. De Dios and J. Madrid, *On classical inequalities for autocorrelations and autoconvolutions*, preprint submitted (2021).
Accepted for publication:
5. J. De Dios, R. Greenfeld, P. Ivanisvili and J. Madrid, *Additive energies on discrete cubes*, Discrete analysis (accepted), 2023.
6. F. Goncalves, R. Greenfeld and J. Madrid, *Generalized Collatz maps with almost bounded orbits*, Indiana University Mathematics Journal (accepted), 2022.
7. D. Beltran, C. González-Riquelme, J. Madrid and J. Weight, *Continuity of the gradient of the fractional maximal operator in $W^{1,1}(\mathbb{R}^d)$* , Mathematical Research Letters (accepted), 2021.
Published:
8. A. Abiad, L. de Lima, D. Desai, K. Guo, L. Hogben, and J. Madrid, *Positive and Negative Square Energies of Graphs*, Electronic Journal of Linear Algebra, 39, 307–326, 2023.
9. B. Simon, J. Madrid and D. Wells, *Comparison of ising models under change of a priori measure*, The Physics and Mathematics of Elliot Lieb Vol II, 47–71, European Mathematical Society (2022).
10. P. Durcik, R. Greenfeld, A. Iseli, A. Jamneshan and J. Madrid, *An uncountable ergodic Roth theorem and applications*, Discrete and Continuous Dynamical Systems 2022, 42 (11) 5509-5540.
11. A. Chang, J. de Dios, R. Greenfeld, A. Jamneshan, Z. Li and J. Madrid, *Decoupling for fractal subsets of the parabola*, Mathematische Zeitschrift 301, 1851-1879 (2022).
12. C. González-Riquelme and J. Madrid, *Sharp inequalities for maximal operators on finite graphs, II*, Journal of Mathematical Analysis and Applications 506 (2), 2022, 125647.
13. E. Carneiro, C. González-Riquelme and J. Madrid, *Sunrise strategy for the continuity of maximal operators*, Journal d'Analyse Mathématique 148, 37-84 (2022).
14. C. González-Riquelme and J. Madrid, *Sharp inequalities for maximal operators on finite graphs*, The Journal of Geometric Analysis, 31 (10), 9708-9744 (2021).
15. J. Madrid and J. P. G. Ramos, *On optimal autocorrelation inequalities on the real line*, Communications on Pure and Applied Analysis (2021) , 20 (1) 369–388.
16. R. Han, V. Kovac, M. T. Lacey, J. Madrid and F. Yang, *Improving estimates for discrete polynomial averages*, Journal of Fourier Analysis and Applications 26 (2020), Article 42, 11 pp.
17. D. Beltran and J. Madrid, *Regularity of the centered fractional maximal function on radial functions*, Journal of Functional Analysis 279, No 8 (2020), 108686.
18. L. Cladek, P. Durcik, B. Krause and J. Madrid, *Directional Maximal Function along the Primes*, Publicacions Matemàtiques 65 (2021), 841—858.
19. D. Beltran and J. Madrid, *Endpoint Sobolev continuity of the fractional maximal function in higher dimensions*, International Mathematics Research Notices 2021, No. 22 (2021), 17316-17342.

20. J. Madrid, *Endpoint Sobolev and BV Continuity for Maximal Operators II*, Revista Matemática Iberoamericana 35, no 7 (2019) 2151–2168.
21. H. Luiro and J. Madrid, *The Variation of the Fractional Maximal Function of a Radial Function*, International Mathematics Research Notices 2019, No. 17 (2019), 5284–5298.
22. E. Carneiro, J. Madrid and L. Pierce, *Endpoint Sobolev and BV Continuity for Maximal Operators*, Journal of Functional Analysis, 273, No. 10 (2017), 3262–3294
23. J. Madrid, *Sharp Inequalities for the Variation of the Discrete Maximal Function*, Bulletin of the Australian Mathematical Society 95 No. 1 (2017), 94-107 .
24. E. Carneiro and J. Madrid, *Derivative Bounds for Fractional Maximal Functions*, Transactions of the American Mathematical Society 369, No. 6 (2017), 4063–4092.
25. F.F. Gonçalves, M. Kelly and J. Madrid, *One-Sided Band-Limited Approximations of Some Radial Functions*, Bulletin of the Brazilian Mathematical Society 46, No. 4 (2015), 563–599.

AWARDS AND HONORS

- Bronze Medal, Iberoamerican Interuniversity Competition of Mathematics (CIIM). Petropolis, Brazil 2010.
- National Awards granted by the President of the Republic of Honduras in the presidential house in 2009, 2010 and 2018, and by the Honduran National Congress/House of representatives in 2010.
- Silver Medal, International Mathematical Olympiad (IMO), Astana, Kazakhstan 2010.
- Bronze Medal, International Mathematical Olympiad (IMO), Bremen, Germany 2009.
- Bronze Medal, Iberoamerican Mathematical Olympiad (OIM), Queretaro, Mexico 2009.
- Silver Medal, Central America and Caribbean Mathematical Olympiad (OMCC), Honduras 2008.
- Gold Medal, National Mathematical Olympiad Honduras, 2008

GRANTS AND FELLOWSHIPS

- ‘Ramón y Cajal 2022’ fellowship, awarded by the Spanish ministry of Science. Declined.
- International Congress of Mathematicians - Rio de Janeiro 2018, OpenArms Grant.
- CAPES Ph. D. Fellowship. 2012 - 2016.
- CNPq M. Sc. Fellowship. 2010 - 2012.

CONGRESSES AND CONFERENCES

- Presentations
- (Upcoming) Invited talk at the workshop: ”Potential Theory: Intersections in probability, partial differential equations and harmonic analysis”, Guanajuato, Mexico, October 2023.
 - (Upcoming) Invited talk at the Virginia Polytechnic Institute and State University, Colloquium talk. Blacksburg, Virginia, USA, September 2023.
 - Invited talk at the Workshop in statistical mechanics. Les Diablerets, Switzerland, February 2023.
 - Invited talk at IMPA, Analysis and PDE seminar. Rio de Janeiro, Brazil, February 2023.
 - Invited talk at the University of Geneva, Analysis seminar. Geneva, Switzerland, November 2022.

- Invited talk at Ghent University, Ghent Methusalem junior seminar. Belgium, May 2022 (Via Zoom).
- Invited talk at Chapman University, Analysis and Geometry seminar. Orange, California, USA, April 2022.
- Invited tal at the Probability and Analysis Webinar (PAW), April 2022.
- Invited talk at the 2022 AMS Spring Eastern Virtual Sectional Meeting, Special Session on Crossroads: Ergodic Theory, Harmonic Analysis, and Combinatorics, March, 2022.
- Invited talk at the University of California Irvine, Analysis seminar. Irvine, California, USA, February 2022.
- Invited talk at the Centro de Investigación en Matemáticas, Colloquium talk. Guanajuato, Guanajuato, Mexico, February 2022 (via Zoom).
- Invited talk at the Virginia Polytechnic Institute and State University, Colloquium talk. Blacksburg, Virginia, USA, January 2022 (Via Zoom).
- Invited talk at the Pontificia Universidade Catolica de Rio de Janeiro, Colloquium talk. Rio de Janeiro, Brazil, February 2022 (Via Zoom).
- Invited talk at the University of Arkansas, Colloquium talk. Fayetteville, Arkansas, USA, January 2022 (Via Zoom).
- Invited talk at the University of College London, Colloquium talk. London, United Kingdom, January 2022 (Via Zoom).
- Invited talk at Clemson University, Colloquium talk. Clemson, South Carolina, USA, January 2021 (Via Zoom).
- Invited talk at the University of Birmingham, Colloquium talk. Birmingham, United Kingdom, December 2021 (Via Zoom).
- Invited talk at the University of Georgia, Colloquium talk. Athens, Georgia, USA, November 2021 (Via Zoom).
- Invited talk at the University of Reading, Colloquium talk. Reading, United Kingdom, October 2021 (Via Zoom).
- Invited talk at King's College London, Colloquium talk. London, United Kingdom, August 2021 (Via Zoom).
- Invited talk at the Basque Center for Applied Mathematics, Analysis Seminar. Bilbao, Spain, July 2021 (Via Zoom).
- Invited talk at IMPA-Brazil, Analysis Seminar. Rio de Janeiro, Brazil, June 2021 (Via Zoom).
- Invited talk at Syracuse University, Math Colloquium. Syracuse, New York, USA, March 2021 (Via Zoom).
- Second Multidisciplinary International Congress of Mathematics, UNI - Peru 2021 (Via Zoom).
- Invited talk at the University of New Mexico, Analysis Seminar. Albuquerque, New Mexico, USA, March 2021 (Via Zoom).
- Invited talk at the University of Oklahoma, Math Colloquium. Norman, Oklahoma, USA, February 2021 (Via Zoom).
- Invited talk at the online workshop on Fourier restriction and related topics, February 2021.
- Invited talk at the Harmonic Analysis and Related Topics Session at ICMC Summer Meeting - Chapter 2021, ICMC-USP, Brazil, February 2021 (via Zoom).
- Invited talk at Pontificia Universidad Catolica de Chile, Analysis Seminar. Santiago, Chile, January 2021 (Via Zoom).
- Invited talk at the 2020 Winter Meeting of the Canadian Mathematical Society Special session on Discrete Analysis, December 2020 (Via Zoom).
- Invited talk at Purdue University, Number theory and Analysis Seminar. Indiana, USA, November 2020 (Via Zoom).
- Invited talk at the Universidad Autonoma de Madrid, UAM-ICMAT Analysis Seminar. Madrid, Spain, June 2020 (Via Zoom).

- Invited talk at the 1155 AMS Sectional meeting, special session on recent developments in harmonic analysis. Charlottesville, Virginia, USA, March 2020 (Cancelled).
- Invited talk at the Caltech/UCLA joint Analysis Seminar, Los Angeles, California, USA, January 2020.
- Invited talk at the 1150 AMS Sectional meeting, special session on recent developments in harmonic analysis. Madison, Wisconsin, USA, September 2019.
- Invited talk at the University of Wisconsin - Madison, Analysis Seminar, Madison, Wisconsin, USA, September 2019.
- Invited talk at the International Centre for Theoretical Physics, Math Seminar, Trieste, Italy, August 2019.
- Invited talk at the UCLA Analysis/PDE Seminar, Los Angeles, California, USA, June 2019.
- Invited talk at the UCLA Functional Analysis Seminar, Los Angeles, California, USA, May 2019.
- Invited talk at the Caltech/UCLA joint Analysis Seminar, Pasadena, California, USA, November 2018.
- Invited talk at ICM Satellite Conference in Harmonic Analysis, Porto Alegre, Rio Grande do Sul, Brazil, July 2018.
- Invited Talk at the BCAM - Basque Center for Applied Mathematics, Analysis Seminar. Bilbao, Spain, April 2018.
- Invited Talk at the University of Bonn, Analysis Seminar. Bonn, Germany, February 2018.
- Invited talk at the ICTP–Math Seminar, Trieste, Italy, January 2018.
- Invited talk at Workshop: Harmonic Analysis in Winter, Madrid, Spain, January 2018.
- Invited Talk at the University of Bologna, Analysis Seminar. Bologna, Italy, November 2017.
- Summer School: Decoupling and Polynomial Methods in Analysis, Kopp, Germany, October 2017.
- Invited talk at the Atelier d'Analyse Harmonique 2017, Université de Nantes, France, March 2017.
- Invited talk at the Meeting of the Royal Spanish Mathematic Society (RSME), Special Session in “Harmonic Analysis”, Zaragoza, Spain, February 2017.
- Invited talk at the University of Manitoba, Mathematics Colloquium, Winnipeg, Manitoba, Canada, October 2016.
- Invited talk at the University of Manitoba, Approximation Theory, Applications and Related Topics Seminar, Winnipeg, Manitoba, Canada, October 2016.
- Invited Talk at the University of Helsinki, Harmonic Analysis and PDE Seminar. Helsinki, Finland, September 2016.
- Short Talk at the 10th International Conference on Harmonic Analysis and Partial Differential Equations, El Escorial, Madrid, Spain. June 2016
- Poster Presentation, Conference in Harmonic Analysis in Honor of Michael Christ, University of Wisconsin-Madison, USA, May 2016.
- Invited Talk at the Baylor University, Mathematics Colloquium. Waco, Texas, USA, February 2016.
- Invited Talk at the Aalto University, Harmonic Analysis and PDE Seminar. Helsinki, Finland, January 2016.
- Analysis and PDE's Seminar, IMPA, Rio de Janeiro, Brazil, December 2015.
- Invited Talk at the 1st Joint Meeting Brazil - Spain in Mathematics, Special Functions and Approximation Theory Session. Fortaleza, Ceara, Brazil, December 2015.
- Invited Talk at the XXX Brazilian Colloquium of Mathematics, Harmonic Analysis Session. IMPA, Rio de Janeiro, Brazil, July 2015.
- Invited Talk at the National University of Honduras (UNAH), Emalca, Tegucigalpa, Honduras, June 2013.

- Invited Talk at the University of El Salvador (UES), San Salvador, El Salvador, December 2012.

Participation

- AIM Workshop: Spectral graph and hypergraph theory, connections and applications. American Institute of Mathematics, San Jose, California, USA, December 2021.
- AIM Workshop: Arithmetic statistics, discrete restriction, and Fourier analysis. American Institute of Mathematics, San Jose, California, USA, February 2021.
- Madison Lectures in Fourier Analysis, in Honour to Andreas Seeger, Madison, Wisconsin, USA, May, 2019.
- International Congress of Mathematicians (ICM), Rio de Janeiro, Brazil, August 2018.
- Geometric Aspects of Harmonic Analysis, in Honour to Fulvio Ricci, Cortona, Italy, June 2018.
- Summer school and workshop: Harmonic Analysis, Spectral Theory and PDE's, Sapienza - Universita di Roma, Italy, September 2017.
- Harmonic analysis and its interactions: in honour of Tony Carbery, Edinburgh, Scotland, UK, July 2017.
- 23rd Rolf Nevanlinna colloquium, ETH-Zurich, Switzerland, June 2017.
- Recent Developments in Harmonic Analysis, Mathematical Sciences Research Institute (MSRI), Berkeley, California, USA, May, 2017.
- Introductory Workshop: Harmonic Analysis, Mathematical Sciences Research Institute (MSRI), Berkeley, California, USA, January 2017.
- Around Analysis, Domains and Mappings. University of Jyvaskyla, Jyvaskyla, Finland, December 2016.
- Nonlinear, nonlocal problems and stochastic methods. Aalto University, Espoo, Finland, December 2016.
- Analysis and Beyond: Celebrating Jean Bourgain's Work and Impact. Institute for Advanced Study (IAS), Princeton, New Jersey, USA, May 2016.
- International Conference on Current Trends in Analysis and PDEs. IMPA, Rio de Janeiro, Brazil, August 2015.
- International Workshop on Elliptic and Kinetic PDEs. IMPA, Rio de Janeiro, Brazil, July 2015.
- International Conference in Number Theory and Physics. IMPA, Rio de Janeiro, Brazil, June 2015.
- School in Computational Algebra and Number Theory, Montevideo, Uruguay, December 2014.
- Harmonic Analysis and Partial Differential Equations. Hausdorff Research Institute for Mathematics (HIM), Trimester Program, Bonn, Germany, July - August 2014.
- New Trends in Applied Harmonic Analysis. CIMPA, Mar del Plata, Argentina, August 2013.

TEACHING EXPERIENCE

[A] At the University of Geneva (Switzerland).
Harmonic Analysis. Graduate level. Spring 2023.

[A'] Instructor at UCLA (USA).

Math 131A: Real analysis. Instructor and course coordinator. Bachelor program. Upper division. Spring quarter 2022.

Math 131B: Analysis on metric spaces. Instructor and course coordinator. Bachelor program. Upper division. Winter quarter 2022.

Math 31B: Singular variable calculus. Instructor and course coordinator. Bachelor program. Lower division. Fall quarter 2021.

Math 131B: Analysis on metric spaces. Instructor and course coordinator. Bachelor program. Upper division. Spring quarter 2021.

Math 31B: Singular variable calculus. Bachelor program. Lower division. Winter quarter 2021.

Math 131B: Analysis on metric spaces. Instructor and course coordinator. Bachelor program. Upper division. Fall quarter 2020.

Math 131A: Real analysis. Bachelor program. Upper division. Summer session A 2020.

Math 33A: Linear algebra and applications. Bachelor program. Lower division. Spring quarter 2020.

Math 115A: Linear algebra. Bachelor program. Upper division. Winter quarter 2020.

Math 31B: Singular variable calculus. Bachelor program. Lower division. Winter quarter 2020.

Math 131A: Real analysis. Bachelor program. Upper division. Fall quarter 2019.

Math 31B: Singular variable calculus. Bachelor program. Lower division. Spring quarter 2019.

Math 33A: Linear algebra and applications. Bachelor program. Lower division. Winter quarter 2019.

Math 131A: Real analysis. Bachelor program. Upper division. Winter quarter 2019.

Math 115A: Linear algebra. Bachelor program. Upper division. Fall quarter 2018.

I have been invited by the Math department to be the course coordinator for Math 131B (analysis on metric spaces) in the fall 2020, spring 2021 and winter of 2022; and for Math 31B (singular variable calculus) in the fall of 2021. I advised and helped other instructors according to my previous experience, in particular regarding the grading schemes, elaboration of exams, homework problems, topics discussed, etc.

[B] Teaching Assistant for Master and Ph.D courses.

[1] At ICTP (Italy).

Functional Analysis. Jan-Mar 2018.

Real Analysis. Oct-Dec 2017.

[2] At Aalto University (Finland).

Harmonic Analysis. Jan-Feb 2017.

[3] At IMPA (Brazil).

Introduction to Number Theory. MSc program. Jan-Feb 2016

Harmonic Analysis. PhD Program. Mar-Jun 2015.

Analytic Number Theory. PhD Program. Jan-Feb 2015.

Algebra II. MSc program. Aug-Nov 2014.

Complex Analysis. MSc program. Mar-Jun 2014.

Introduction to Number Theory. MSc program. Jan-Feb 2014.

- OTHER ACTIVITIES
- Co-organizer of the Probability and Analysis webinar (PAW), September 2022-.
 - Co-organizer of the Analysis seminar at the University of Geneva, 2022–2023.
 - Jointly with David Beltran (Wisconsin) I organized a special session in Harmonic Analysis, in the Fall Western Sectional Meeting of the American Mathematical Society, at the University of New Mexico, Albuquerque, NM, in October 2021 (Meeting 1172).
 - Jointly with Terence Tao (UCLA) and Simon Larson (Caltech) I co-organize the Caltech/UCLA joint analysis seminar, 2020-2021.
 - Member of the Honduran committee for math olympiads, 2020-.
 - Co-organizer of the math seminar at the ICTP, 2017–2018.

- Participation in the organization of several training sessions for high-school students intending to participate in international mathematical olympiads representing Honduras. I continue doing this via Zoom during the weekends.
- Member of the team responsible for reviewing the exam problems at the 29th Iberoamerican Mathematical Olympiad, 2014.
- Referee service for many journals including: Journal of the European Mathematical Society, Transactions of the American Mathematical Society, Advances in Mathematics, Journal of Functional Analysis, Proceedings Edinburgh Mathematical Society, Annales Academiae Scientiarum Fennicae, Journal of Nonlinear Analysis, Journal of Mathematical Analysis and Applications, Journal of Mathematical Inequalities, Collectanea Mathematica.

LANGUAGES

- English (fluent).
- Spanish (native).
- Portuguese (fluent).
- Italian (Intermediate).

REFERENCES

Professor Emanuel Carneiro
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