Dr Maria Carmen Reguera

Birmingham Fellow

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About

Maria Carmen Reguera is a Birmingham fellow and a member of the Mathematical Analysis Research Group in the School of Mathematics.

Maria works on harmonic analysis and especially on the theory of weighted inequalities for singular integral operators. She is also interested in related questions in operator theory for Bergman spaces and geometric analysis.

Qualifications

- PhD in Harmonic Analysis, Georgia Institute of Technology, 2011.
- BA in Mathematics, Universidad de Sevilla, 2004.

Biography

Maria Carmen Reguera received the BA degree in Mathematics from the University of Sevilla in 2004. She started her research career at the University of Missouri-Columbia in 2005. In 2008 she joined the Georgia Institute of Technology, where she finished her PhD degree on Harmonic Analysis.

Maria's first postdoctoral position in 2011 was at the University of Lund (Sweden), which was followed by a Juan de la Cierva fellowship at the Universitat Autonoma de Barcelona (Spain). Maria received the Birmingham fellowship in 2012.

Postgraduate supervision

Maria is interested in supervising doctoral research students in harmonic analysis, weighted theory and related topics.

Research

Research themes

- Harmonic Analysis, Complex Analysis and Operator Theory.

Research activity

Maria's research interests lie in harmonic analysis, and especially in the theory of weights for singular integrals. Her initial work was concerned with weighted sharp inequalities for singular integral operators in terms of the weight's constant. This question is of significant importance in the study of the regularity of solutions to the Beltrami equation and it has received a lot of attention in the recent years.

A very important question closely related to the previous one is the boundedness properties of singular integrals with respect to those of the Hardy-Littlewood maximal function in a weighted context. Maria and collaborators have provided counterexamples that show that, outside the classical realm of weights, one does not have the classical implications. Namely, that boundedness of the maximal function does not necessarily imply boundedness of the singular integral. There are a number of interesting questions in this particular area that still remain open.

Maria's more recent interests also include operator theory, and more precisely the application of classical weighted theory to understand compositions of operators in spaces of analytic functions like the Bergman spaces.

Publications

Selected:

- M.T. Lacey, S. Petermichl and M.C. Reguera (2010), Sharp A2 Inequality for Haar Shift Operators, Mathematische Annalen, Volume 348, no. 1, 127-141.
- M.C. Reguera (2011), On Muckenhoupt-Wheeden conjecture, Advances in Mathematics, Volume 227, no 4, 1436-1450.
- M.C. Reguera and C. Thiele (2012), The Hilbert transform does not map $L^1(Mw)$ to $L^{1,\infty}(w)$, Math. Res. Lett., vol. 19, no. 01, 17 .
- M.C. Reguera and J. Scurry (2013), On joint estimates for Maximal functions and Singular Integrals in weighted spaces, Proc. Amer. Math. Soc. 141, no. 5, 1705–1717.
- S. Pott and M.C. Reguera (2013), Sharp Békollé estimates for the Bergman Projection, J. Funct. Anal. 265 , no. 12, 3233–3244.

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