

Manuel Domínguez de la Iglesia

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RESEARCH INTERESTS	Approximation theory, special functions, orthogonal polynomials, differential equations, matrix analysis, Riemann-Hilbert problems, Markov processes, stochastic calculus, data mining, time series, principal component analysis	
EDUCATION	Universidad de Sevilla, Sevilla, Spain Ph.D. Mathematics (February, 2008) <ul style="list-style-type: none">• Thesis title: “Differential properties of families of matrix orthogonal polynomials and applications”• Advisor: Antonio J. Durán Universidad de Sevilla, Sevilla, Spain M.S., Mathematics, September, 2005 Universidad de Sevilla, Sevilla, Spain B.A., Mathematics, June, 2003	
HONORS AND AWARDS	Premio Extraordinario de Doctorado en Ciencias (Best PhD Dissertations in Science). Universidad de Sevilla (2009).	
EMPLOYMENT	Postdoctoral fellowship in Mathematics. Departamento de Análisis Matemático, Universidad de Sevilla (January, 2011 - present). Postdoctoral fellowship in Mathematics. Courant Institute of Mathematical Sciences, University of New York (January, 2009 - December, 2010). Postdoctoral fellowship in Mathematics. Katholieke Universiteit Leuven (May, 2008 - December, 2009). Ph.D. graduate fellowship in Mathematics. Universidad de Sevilla (May, 2004 - May, 2008). Undergraduate research fellowship. Universidad de Sevilla (September, 2002 - July, 2003).	
BOOKS	“Differential properties of families of matrix orthogonal polynomials and applications” (PhD Thesis), Publications of the Universidad de Sevilla. ISBN/ISSN: 978-84-6925-7.	
PUBLICATIONS	“Spectral methods for bivariate Markov processes with diffusion and discrete components and a variant of the Wright-Fisher model”, submitted. See arXiv:1107.3733v1. “Properties of matrix orthogonal polynomials via their Riemann-Hilbert characterization” (with F. A. Grünbaum and A. Martínez-Finkelshtein), submitted. See arXiv:1106.1307v1.	

“Principal dynamical components” (with Esteban G. Tabak), submitted. See arXiv:1012.3963v1.

“Some examples of matrix-valued orthogonal functions having a differential and an integral operator as eigenfunctions”, *J. Approx. Theory* **163**, No. 5, (2011), 663–687.

“A note on the invariant distribution of a quasi-birth-and-death process”, *J. Phys. A: Math. Theor.* **44** (2011) 135201 (9pp).

“Second order differential operators having several families of orthogonal matrix polynomials as eigenfunctions” (with A. J. Durán), *Internat. Math. Research Notices*, Vol. 2008, Article ID rnn084, 24 pages.

“Matrix valued orthogonal polynomials arising from group representation theory and a family of quasi-birth-and-death processes” (with F. A. Grünbaum), *SIAM J. Matrix Anal. Applic.* **30**, No. 2 (2008), 741–761.

“Some examples of orthogonal matrix polynomials satisfying odd order differential equations” (with A. J. Durán), *J. Approx. Theory* **150**, No. 2, (2008), 153–174.

“Matrix valued orthogonal polynomials related to $SU(N + 1)$, their algebras of differential operators and the corresponding curves” (with F. A. Grünbaum), *Exp. Math.* **16**, No. 2, (2007), 189–207.

VISITS	Courant Institute of Mathematical Sciences, New York University	March, 2008 - April, 2008
	University of California at Berkeley, Berkeley, California USA	February, 2007 - July, 2007
	Universidad Nacional de Córdoba, Córdoba, Argentina	March, 2006 - June, 2006
	University of California at Berkeley, Berkeley, California USA	February, 2005 - May, 2005

ACADEMIC EXPERIENCE	Universidad de Sevilla, Sevilla, Spain	
	<i>Graduate Student Instructor</i>	September, 2006 - February, 2008

- Análisis Matemático I (calculus) at Physics Department, Universidad de Sevilla, Fall 2007.
- Métodos Matemáticos de la Física II (O.D.E and multivariable calculus) at Physics Department, Universidad de Sevilla, Fall 2006.
- Análisis Matemático I (calculus) at Physics Department, Universidad de Sevilla, Fall 2006.

CONFERENCE PRESENTATIONS/ SEMINARS	“Some examples of matrix-valued orthogonal functions having a differential and an integral operator as eigenfunctions”. Congreso de la Real Sociedad Matemática Española 2011. Ávila, February 1-5, 2011. http://euler.us.es/~opap/opsf-rsme/
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“Differential properties of orthogonal matrix polynomials”. I Spanish Young Researchers Meeting in Mathematics. I Spanish Young Researchers Meeting in Mathematics. Universidad de Sevilla, Spain. September, 3, 2010.
<http://congreso.us.es/enjim/Documents/Program.pdf>

“Differential properties of orthogonal matrix polynomials”. International Congress of Mathematicians. Hyderabad, India. August, 21, 2010.
http://www.icm2010.org.in/wp-content/icmfiles/docs/schedule/short_aug13.pdf

“Methods and new phenomena of orthogonal matrix polynomials satisfying differential equations”. 13th International Conference in Approximation Theory. San Antonio, Texas. March, 9, 2010.

<http://www.math.vanderbilt.edu/~at13/>

“Riemann-Hilbert techniques in the theory of orthogonal matrix polynomials”. XI Encuentros de Análisis Real y Complejo. Chinchón, Madrid. May, 10, 2009.

<http://www.oblicua.com/earco/programa.html>

“The Riemann-Hilbert problem for matrix-valued orthogonal polynomials”. Katholieke Universiteit Leuven. Leuven, November, 5, 2008.

<http://wis.kuleuven.be/analyse/arno/walter50/WOPSF.html>

“A family of quasi-birth-and-death processes coming from the theory of matrix valued orthogonal polynomials”. International workshop on orthogonal polynomials and approximation theory. Universidad Carlos III de Madrid. Leganes, Madrid, September, 8, 2008.

<http://turan.uc3m.es/uc3m/dpto/MATEM/iwopa08/schedule.htm>

“Methods and applications of orthogonal matrix polynomials satisfying differential equations”. Seminar Classical Analysis. Katholieke Universiteit Leuven. Leuven, June, 11, 2008.

<http://wis.kuleuven.be/analyse/seminar-classical.html>

“The convex cone of weight matrices associated with a symmetric second order differential operator: some examples”. Workshop on orthogonal polynomials and special functions. Katholieke Universiteit Leuven. Leuven, May, 20, 2008.

<http://wis.kuleuven.be/analyse/arno/walter50/WOPSF.html>

“A family of quasi-birth-and-death processes coming from the theory of matrix valued orthogonal polynomials”. Poster at 3emes Journees Approximation. Universite de Lille 1. Lille, May, 15, 2008.

“Differential properties of some families of matrix valued orthogonal polynomials and applications”. Random matrices and integrable systems working seminar. Courant Institute of Mathematical Sciences. New York, March, 11, 2008.

<http://www.cims.nyu.edu/~nenciu/seminar.html>

“Matrix valued orthogonal polynomials satisfying differential equations”. XX Congreso de Ecuaciones Diferenciales y Aplicaciones. X Congreso de Matemática Aplicada. Sevilla, September, 24-28, 2007.

<http://www.congreso.us.es/cedya2007/>

“Second order differential operators having several families of orthogonal matrix polynomials as eigenfunctions”. Special Functions, Information Theory and Mathematical Physics. Granada, September, 17-19, 2007.

<http://www.ugr.es/~jsd60th/>

“New phenomena on examples of orthogonal matrix polynomials satisfying differential equations”. 2007 AMS Spring Western Section Meeting. Tucson, Arizona (USA), April, 22-23, 2007.

http://www.ams.org/amsmtgs/2135_abstracts/1027-42-56.pdf

“Some examples of orthogonal matrix polynomials satisfying odd order differential equations”. 12th International Conference in Approximation Theory. San Antonio, Texas (USA). March, 4-6, 2007.

<http://www.math.vanderbilt.edu/~at07/tmp/abstracts.pdf>

“Matrix valued orthogonal polynomials related to $SU(N+1)$, their algebras of differential operators and the corresponding curves”. Recent trends in Constructive Approximation Theory. Universidad Carlos III de Madrid. August, 30-31, September, 1, 2006.

<http://www.uc3m.es/uc3m/dpto/MATEM/OrthApprox/ICM06/abstractpart.html#mdominguez>