
CURRICULUM VITAE

1) **NAME:** Sandra Rita Martinez

2) **POSITION TITLE:** Co-Principal Investigator, Adjunct Professor, Researcher of CONICET (Independent).

3) EDUCATION/TRAINING

| INSTITUTION AND LOCATION | DEGREE | Completion Date | FIELD OF STUDY |
|----------------------------|--------|-----------------|----------------|
| University of Buenos Aires | MS | 12/2001 | Mathematics |
| University of Buenos Aires | PhD | 3/2007 | Mathematics |

4) Positions and Honors

- 1998-2002- Student teaching assistant, Universidad de Buenos Aires, School of Science, Dept. of Mathematics.
- 2002-2010. - Teaching assistant, Universidad de Buenos Aires, School of Science, Dept. of Mathematics, on leave during August 2007- February 2008.
- August 2007- February 2008- Assistant Professor, Universidad de General Sarmiento, School of Science.
- September 2010- Adjunct Professor, Math Department, School of Science, Dept. of Mathematics, Universidad de Buenos Aires, Present position.
- Starting April 2008. Researcher of the CONICET (The national research council of Argentina). Present position: Independent Researcher.

Fellowships

- May 2001-March 2002, Beca estímulo (Student fellow of the University of Buenos Aires). Advisor: Julio. D Rossi.
- April 2002- April 2007, Doctoral fellowship, granted by CONICET (The national research council of Argentina). Advisors: Julio. D Rossi- Noemi Wolanski.
- April 2007- April 2008. Post-doctoral fellowship, granted by CONICET (The national research council of Argentina). Advisor: Noemi Wolanski.

5) Publications

1. S Martínez, JD Rossi, *Isolation and simplicity for the first eigenvalue of the p -Laplacian with a nonlinear boundary condition*. Abstract and Applied Analysis 7 (5), 287-293 (2002).
2. S. Martínez - J. D. Rossi. *Weak solutions for the p -Laplacian with a nonlinear boundary condition at resonance*. Electronic Journal of Differential Equations. Vol. 2003, No. 27, 1-14, (2003).
3. J. Fernandez Bonder - S. Martinez - J. D. Rossi. *The behavior of the best Sobolev trace constant and extremals in thin domains*. Journal of Differential Equations. Vol 198/1, 129-148 (2003).
4. S. Martínez- J. D. Rossi. *On the Fucik spectrum and a resonance problem for the p -Laplacian with a nonlinear boundary condition*. Nonlinear analysis, theory, methods and applications Vol 59, no 6, 813-848.(2004).
5. J. Fernandez Bonder - S. Martínez -N. Wolanski. *An optimization problem with volume constrain for a degenerate quasilinear operator*. J. Differential Equations, 227 (2006), no. 1, pp. 80-101.
6. Fernandez Bonder - S. Martinez - J. D. Rossi. *Existence results for gradient elliptic systems with nonlinear boundary conditions*. NoDEA Nonlinear Differential Equations Appl, Vol 14, no. 1-2, pp. 153-179, 2007.
7. S. Martinez. *An optimization problem with volume constraint in Orlicz spaces*. Journal of mathematical analysis and applications, Vol.340, N 2, 2008, pp 1407-1421 .
8. Martínez, S., Wolanski, N. *A minimum problem with free boundary in Orlicz spaces*. Advances in Mathematics, 218(6), pp. 1914–1971 (2008) .

9. S. Martínez -N. Wolanski. *A singular perturbation problem for a quasilinear operator satisfying the natural growth condition of Lieberman*. SIAM J. Math. Anal. 41 (2009), no. 1, 318-359.
10. J. Fernandez Bonder- S. Martínez -N. Wolanski. *A free boundary problem for the $p(x)$ -Laplacian*. Nonlinear Analysis 72 (2010), no. 1078-1103.
11. Del Pezzo, L.M., Lombardi, A.L., Martínez, S. *Interior penalty discontinuous Galerkin FEM for the $p(x)$ -Laplacian*. SIAM Journal on Numerical Analysis, 50(5), 2497–2521 (2012).
12. L. Del Pezzo- A. Lombardi - S. Martínez. *H^2 regularity for the $p(x)$ -Laplacian in two-dimensional convex domains*. Journal of Mathematical Analysis and Applications 410 (2), 939–952 (2013).
13. L. M. Del Pezzo & S. Martínez, *Order of convergence of the finite element method for the $p(x)$ -Laplacian*. IMA Journal of Numerical Analysis, 35(4) , 1864-1887 (2015).
14. J.P. Borthagaray, L. M. Del Pezzo & S. Martínez. *Finite element approximation for the fractional eigenvalue problem*. S. J Sci Comput, 7(1), 308–329, (2018).
15. S. Martínez, M. Toscani & O. E. Martínez *Super-resolution method for a single wide field image deconvolution by superposition of point sources*. J. Microscopy, 275(1), 51–65 (2019).
16. G. D. Brinatti Vazquez, S. Martínez, and O. E. Martínez, *Super-resolved edge detection in optical microscopy images by superposition of virtual point sources*, Opt. Express 28, 25319-25334 (2020).
17. M. Toscani & S. Martínez *Solving the boundary artifact for the enhanced deconvolution algorithm SUPPOSE applied to fluorescence microscopy*. Comp. Optics 45(3) 418-426 (2021).

Proceedings

1. M. Toscani, S. Martínez, O. E. Martínez, *Single image deconvolution with super-resolution using the SUPPOSE algorithm*, Proc. SPIE 10884, Single Molecule Spectroscopy and Superresolution Imaging XII, 1088415 (22 February 2019); doi: 10.1117/12.2508869.
2. A.M. Lacapmesure, S. Martínez, O.E. Martínez. *A new objective function for super-resolution deconvolution of microscopy images by means of a genetic algorithm*, GECCO 2020 Companion - Proceedings of the 2020 Genetic and Evolutionary Computation Conference Companion, 271–272 (2020).
3. Micaela Toscani , Alejandro Mazzeo, Sandra Martinez, Oscar Martinez, Axel Lacapmesure, Guillermo Brinatti Vazquez. *Sources of error, artifacts, acceleration and validation of the deconvolution algorithm with super-resolution for microscopy images*. The Proceedings of the Fifth IEEE Biennial Congress of Argentina, IEEE ARGENCON 2020. <https://ieeexplore.ieee.org/document/9505479>

Other publications

Guillermo D. Brinatti Vazquez, Axel M. Lacapmesure, Micaela Toscani, Sandra Martínez, Oscar Martínez. *Super-Resolution Microscopy from Standard Images*. Included in the special issue of *Optics & Photonics News* that highlights exciting peer-reviewed optics research that has emerged over the past year, 2020. https://www.osa-opn.org/home/articles/volume_31/december_2020/extras/super-resolution_microscopy_from_standard_images/

6) Research Support and/or Scholastic Performance

Recent and relevant Research support.

Air Force Office of Scientific Research.

Grant Number and dates: FA9550-18-1-0470, 2018-2021 (no duplicate funding with this proposed grant).

Title: Super-resolution imaging in 2D and 3D using the SUPPOSE algorithm based on approximating the imaged object by a superposition of point sources

PI: Oscar Eduardo Martínez.

University of Buenos Aires: Programación Científica UBACYT 2018-2021

Grant Number and dates: 20020170100137BA, 2018-2021 (no duplicate funding with this proposed grant).

Title: Biothermal, photothermal and 3D Super-resolution Microscopy

PI: O. E. Martínez.

Co-PI: N. Mingolo.

Minister of Science ANPCYT.

Grant Number and date: PICT-2015-1523, 2016-2020.

Title: Biothermal, photothermal and 3D Super-resolution Microscopy. New developments for new challenges.

PI: Oscar Eduardo Martínez.

Minister of Science ANPCYT.

Grant Number and Date: PICT 2013-0651, 2014-2016.

Title: Métodos numéricos y regularidad de soluciones de ecuaciones diferenciales con condiciones de crecimiento no standard.

PI: Sandra Martínez.

University of Buenos Aires: Programación Científica UBACYT 2010-2012.

Grant Number and date: 20120090300110BA, 2010-2012.

Title: Problemas elípticos con condiciones de crecimiento no standard.

PI: Sandra Martínez.

Organization of workshops and conferences

-V International Symposium on Nonlinear Equations and Free Boundary Problems, Buenos Aires, December 18- 21,2017.

-X Americas Conference on Differential Equations and Nonlinear Analysis, Buenos Aires, February 9- 20, 2015.

- EIED 2008 (Third International Encountered on Differential Equations) and First winter school "Luis A. Santaló", Buenos Aires, 2008.

- PDE 2009 (Fourth International Symposium on Nonlinear PDEs and Free Boundary Problems), on the occasion of Luis Caffarelli's 60th birthday, Mar del Plata, 2009.

Human resources training

- Co-advisor of the post-doctoral fellowship of Ph.D. Leandro Del Pezzo granted by CONICET, April 2010- April 2011.

- MS thesis advisor of Carolina Moreno, Universidad de Buenos Aires "Aproximación por Elementos Finitos y Regularidad para el p-Laplaciano en \mathbb{R}^2 " (Finite Element approximation and regularity for the p-laplacian in \mathbb{R}^2), May 2014. Qualification: 10/10.

- Micaela Toscani. PhD Thesis Co-advisor. Universidad de Buenos Aires. In progress.

- Axel M. Lacapmesure. PhD Thesis advisor. Universidad de Buenos Aires. In progress.