

Eduardo Teixeira

Professor of Mathematics

University of Central Florida
Department of Mathematics
Orlando, USA

✉ eduardo.teixeira@ucf.edu

🏠 www.sciences.ucf.edu/math/eteixeira/

November, 2017

Personal Information

Date of Born April 9, 1976

Citizenship Brazilian

Married to Katiuscia C.B. Teixeira

Father of Amanda, 10-year old, Arthur, 4-year old & Anthony, 1-year old

Education

2001–2005 **Ph.D. in Mathematics**, *University of Texas at Austin*, U.S.A.
Advisor: LUIS A. CAFFARELLI

1997–2001 **B.S & M.S. in Mathematics**, *Universidade Federal do Ceará*, Brazil.

Employment

2017–current **Full Professor**, *University of Central Florida*, U.S.A..

2010–2017 **Full Professor**, *Universidade Federal do Ceará*, Brazil.

2008–2010 **Assistant Professor**, *Universidade Federal do Ceará*, Brazil.

2005–2008 **Hill Assistant Professor**, *Rutgers University*, U.S.A.

Select prizes and honors

2017 ICTP-IMU Ramanujan Prize

2015 Elected Fellow of the Brazilian Academy of Sciences

2015 CNPq Researcher **1B**

2013 Mathematical Congress of the Americas Prize

2011 TWAS Young Affiliate (elected)

2009 ICTP associate member (elected)

2007 Affiliate member of the Brazilian Academy of Sciences (elected)

Editorial services and chairing committees

- 2014–present Editor-in-Chief of *Coleção Fronteiras da Matemática* – Brazilian Mathematical Society.
- 2016–present Executive Editor of *Notas em Matemática Aplicada* – Brazilian Society of Computational and Applied Mathematics.
- 2012–present Editorial board of *Interfaces and Free Boundaries* – EMS Publishing House.
- 2017–present Editorial board of *Bulletin of Parana's Mathematical Society* – SPM Publishing House.
- 2014–present Chair of *2018 ICM Parallel Activities and Satellite Events Committee*.

Select recent talks

- 2017 Invited speaker, V International Symposium on Nonlinear Equations and Free Boundary Problems, Buenos Aires – Argentina.
- 2016 Plenary speaker, First Joint Meeting Brazil–Italy in Mathematics. Rio de Janeiro – Brazil
- 2015 Keynote speaker, Annual Meeting of the Sociedad de Matemática de Chile, Pucón – Chile
- 2015 Speaker, X Americas Conference on Differential Equations and Nonlinear Analysis, Buenos Aires – Argentina.
- 2014 Plenary Speaker, Isaac Newton Institute for Mathematical Sciences — Free Boundary Problems and Related Topics, Cambridge – U.K.
- 2014 Plenary Speaker, ICMC Summer Meeting in honor to Djairo de Figueiredo, São Carlos – Brazil
- 2013 Invited Speaker, 1st Mathematical Congress of the Americas, Guanajuato – Mexico
- 2013 Special Lecture, Conference on Nonlinear Elliptic Equations, Rutgers University – U.S.A.
- 2012 Plenary Speaker, XVII Brazilian School of Differential Geometry, Manaus – Brazil
- 2012 Plenary Speaker, 12th International Conference on Free Boundary Problems: Theory and Applications, Chiemsee – Germany

Ph.D. students

- 2011–2015 João Vitor da Silva; Thesis Publication: *Interfaces Free Bound. & Math. Ann.*
- 2010–2014 Disson dos Prazeres; Thesis Publication: *Ann. Sc. Norm. Super. Pisa Cl. Sci. & Calc. Var. Partial Differential Equations.*

- 2010–2014 Marcelo Amara; Thesis Publication: *Comm. Math. Phys* — Thesis distinguished at the 2015 Carlos Gutierrez Prize.
- 2009–2012 Damião Araújo; Thesis Publication: *Arch. Rational Mech. Anal. & Calc. Var. Partial Differential Equations*. — Thesis distinguished at the 2013 Carlos Gutierrez Prize.
- 2009–2012 Raimundo Leitão Junior; Thesis Publication: *Rev. Mat. Iberoamericana & Ann. Inst. H. Poincaré Anal. Non Linéaire*.
- 2008–2010 Gleydson Ricarte; Thesis Publication: *J. Funct. Anal.*

Post-doctorate supervision

- 2016–2016 I. de Sousa - Ph.D. from Universidade Federal do Ceará.
- 2014–2015 E. Pimentel - Ph.D. from Instituto Superior Técnico de Lisboa.
- 2013–2014 R. Teymurazyan - Ph.D. from Universidade de Lisboa & University of Texas at Austin.
- 2013–2014 D. Araújo - Ph.D. from Universidade Federal do Ceará.

Select grants awards – Principal Investigator

- 2016 Programa de Apoio a Núcleos de Excelência – Pronex
- 2015 CNPq Researcher Grant 1B
- 2015 Fapesp's Distinguished Researcher Program
- 2014 CNPq's Projeto Universal (C)
- 2014 Capes' Sciences w/o Boarders
- 2013 Funcap's International Collaboration Program
- 2012 CNPq's Projeto Universal (B)
- 2012 Capes's Sciences w/o Boarders
- 2011 CNPq Researcher Grant 1D
- 2008 CNPq Researcher Grant 2
- 2006 NSF standard grant

Recent organizing and scientific committees

- 2017 Special Session on Nonlinear Elliptic PDEs, AMS Sectional Meeting, Orlando.
- 2016 Nonlinear PDE @ IMPA, Rio de Janeiro.
- 2016 ICMC Summer Meeting, USP São Carlos.
- 2015 30th Brazilian Colloquium of Mathematics.
- 2015 Current Trends in Analysis and Partial Differential Equations, Rio de Janeiro.

- 2015 Capes School of High Studies, IMPA.
 2014 XV International Conference on Hyperbolic Problems, IMPA.

Selected other academic services

- 2016–present Member of Election Committee for Affiliate Member of the Brazilian Academy of Sciences.
- 2016–2016 Member Capes' Journals Evaluation Board — QUALIS.
- 2014–2014 President of Capes Prize Committee for best Ph.D. thesis.
- 2012–2014 Head Director, Mathematics Research Division and Graduate Studies Program. Department of Mathematics at Universidade Federal do Ceará.
- 2009–2012 Vice-head, Department of Mathematics at UFC.
- 2008–present Scientific consultant for CNPq, Capes, Fapesp, Funcap, FCT of Portugal, CONICET of Argentina, CONICYT of Chile, NCSTE of Kazakhstan.
- 2004–present Referee for *GAFSA*, *JEMS*, *Amer. J. Math*, *Anal. PDE*, *Adv. Math*, *Ann. Inst. H. Poincaré Anal. Non Linéaire*, *J. Funct. Anal.*, *J. Ecole Polytechnique*, *Math. Ann.*, *TAMS*, *RMI*, *Arch. Rational Mech. Anal.*, *Calc. Var. and PDE*, *CPDE*, *SIMA*, *JDE*, *JGA*, *Comm. Math. Phys*, *POTA*, *JLMS*, *BLMS*, *PLMS*, *IFBs*, among many others.

Articles published or accepted for publications

- A proof of the $C^{p'}$ regularity conjecture in the plane. (with D. Araujo and JM Urbano) *Adv. Math.* 316 (2017), 541–553.
- Sharp regularity estimates for second order fully nonlinear parabolic equations. (with JV Silva). *Math. Ann.* 369 (2017), no. 3-4, 1623–1648.
- Towards the $C^{p'}$ regularity conjecture in higher dimensions. (with D. Araujo and JM Urbano). To appear in *Int. Math. Res. Not. IMRN*.
- Regularity principle in sequence spaces and applications. (with D. Pellegrino, J. Santos, D. Serrano-Rodriquez) *Bull. Sci. Math.* 141 (2017), no. 8, 802–837.
- Singularly perturbed equations of degenerate type. (with D. Araujo and G. Ricarte). *Ann. Inst. H. Poincaré Anal. Non Linéaire.* 34 (2017), no. 3, 655–678.
- Nonlinear elliptic equations with high order singularities. To appear in *Potential Anal.*
- Towards sharp Bohnenblust–Hille constants. (with D. Pellegrino). To appear in *Comm. Contemp. Math.*
- $W^{2,p}$ estimates for fully nonlinear elliptic equations: an asymptotic approach. (with E. Pimentel). *J. Math. Pures Appl.* 106 (2016), pp. 744–767.

- Global Monge-Ampère equations with asymptotically periodic data. (with L. Zhang). *Indiana Univ. Math. J.* 65 No. 2 (2016), 399–422.
- Cavity problems in discontinuous media. (with. D. dos Prazeres). *Calc. Var. Partial Differential Equations.* 55 (2016), no. 1, 55:10.
- Infinity Laplacian equation with strong absorptions. (with. D. Araújo and R. Leitão). *J. Funct. Anal.* 270 (2016), pp. 2249–2267.
- Regularity for the fully nonlinear dead-core problem. *Math. Ann.* 364 (2016), no. 3-4, 1121–1134.
- Regularity for degenerate two-phase free boundary elliptic problems. (with O. Queiroz and R. Leitão). *Ann. Inst. H. Poincaré Anal. Non Linéaire.* 32 (2015), pp. 741–762.
- Hessian continuity at degenerate points in nonvariational elliptic problems. *Int. Math. Res. Not. IMRN.* (2015) Vol. 2015 6893–6906.
- Optimal design problems with fractional diffusions. (with R. Teymurazyan) *J. Lond. Math. Soc.* (2) 92 (2015), no. 2, 338–352.
- Optimal regularity at the free boundary for the infinity obstacle problem. (with J. Rossi and JM Urbano). *Interface Free Bound.* 17 (2015), 381–398.
- Asymptotics and regularity for flat solutions to fully nonlinear elliptic problems. (with D. dos Prazeres). *Ann. Sc. Norm. Super. Pisa Cl. Sci.* Vol. XV (2016), 485–500.
- Regularity estimates for fully non linear equations which are asymptotically convex. (with L. Silvestre). Volume 86 of the series *Progr. Nonlinear Differential Equations Appl.* pp 425-438.
- Free transmission problems. (with M. Amaral). *Comm. Math. Phys.* 337 (2015), no. 3, 1465–1489.
- Geometric gradient estimates for solutions to degenerate elliptic equations. (with D. Araujo and G. Ricarte). *Calc. Var. Partial Differential Equations* 53 (2015), no. 3-4, 605–625.
- Regularity and geometric estimates for minima of discontinuous functionals. *Rev. Mat. Iberoam.* 31 (2015), no. 1, 69–108.
- A geometric tangential approach to sharp regularity for degenerate evolution equations. (with J.M. Urbano). *Anal. & PDE* Vol. 7, No 3 (2014), 733–744.
- Universal moduli of continuity for solutions to fully nonlinear elliptic equations. *Arch. Rational Mech. Anal.* 211 (2014), no 3, 911–927.
- Regularity for quasilinear equations on degenerate singular sets. *Math. Ann.* 358 (2014), no 1, 241–256.
- An intrinsic Liouville theorem for degenerate parabolic equations. (with J.M. Urbano). *Arch. Math.* 102 (2014), 483–487.

- Geometric regularity estimates for elliptic equations. Proceedings of the MCA 2013. *Contemp. Math.* 656 (2016) 185–204.
- Geometric approach to nonvariational singular elliptic equations. (with D. Araújo). *Arch. Rational Mech. Anal.* 209 (2013), no 3, 1019–1054.
- Sharp regularity for general Poisson equations with borderline sources. *J. Math. Pures Appl.* (9) 99 (2013), no. 2, 150–164.
- A limiting free boundary problem ruled by Aronsson’s equation. (with J. Rossi). *Trans. Amer. Math. Soc.* 364 (2012), 703–719.
- An elliptic variational problem involving level surface area on Riemannian manifolds. (with L. Zhang). *Rev. Mat. Iberoam.* 28 (2012), no. 3, 759–772.
- Fully nonlinear singularly perturbed equations and asymptotic free boundaries. (with G. Ricarte). *J. Funct. Anal.* vol. 261, 6, 2011, 1624–1673.
- Existence and regularity properties of non-isotropic singular elliptic equations. (with M. Montenegro and O. Queiroz). *Math. Ann.* 351 (1), (2011) 215–250.
- A local parabolic monotonicity formula on Riemannian manifolds. (with L. Zhang). *J. Geom. Anal.* (2011) 21, No. 3, 513–526.
- Monotonicity theorems for Laplace Beltrami operator on Riemannian manifolds. (with L. Zhang). *Adv. Math.* Vol. 226, Issue 2, 30 (2011), 1259–1284.
- Asymptotic behavior of solutions to the σ_k -Yamabe equation near isolated singularities. (with Z. Han and Y. Li). *Invent. Math.* 182, No. 3, (2010) 635–684.
- Gradient estimates for viscosity solutions of singular fully nonlinear elliptic equations. (with M. Montenegro). *J. Funct. Anal.* 259 (2010) 428–452.
- Optimal design problems in rough inhomogeneous media. Existence theory. *Amer. J. Math.* 132, No 6, 2010, pp. 1445–1492.
- Norm optimization problem for linear operators in classical Banach spaces. (with D. Pellegrino). *Bull. Braz. Math. Soc.* 30 (2009), no 3, 417–431.
- Regularity for obstacle problems in infinite dimensional Hilbert spaces. (with A. Swiech) *Adv. Math.* 220 (2009) no. 3, pp. 964–983.
- A variational treatment for elliptic equations of the flame propagation type: Regularity of the free boundary. *Ann. Inst. H. Poincaré Anal. Non Linéaire.* 25 (2008), pp. 633–658.
- On infinite order and fully nonlinear partial differential evolution equations. *J. Differential Equations* 238 (2007), no 1, 43–63.
- Uniqueness, symmetry and full regularity of free boundary in optimization problems with volume constraint. *Interface Free Bound.* 9 (2007) no. 1, 133–148.

- A singular perturbation free boundary problem for elliptic equations in divergence form. (with D. Moreira). *Calc. Var. Partial Differential Equations* 29 (2007), no 2, 161–190.
- Optimal regularity of viscosity solutions of fully nonlinear singular equations and their limiting free boundary problems. *Mat. Contemp.* 30 (2006), 217–237.
- An optimization problem with free boundary governed by a degenerate quasilinear operator. (with K. Oliveira). *Differential and Integral Equations* 19 (2006), no. 9, 1061–1080.
- The nonlinear optimization problem in heat conduction. *Calc. Var. Partial Differential Equations* 24 (2005), no. 1, 21–46.
- Strong solutions for differential equations in abstract spaces. *J. Differential Equations* 214, p. 65–91, 2005.
- On the behavior of weak convergence under nonlinearities and applications. (with D. Moreira). *Proc. Amer. Math. Soc.* 133 (2005), 1647–1656.
- A topological and geometric approach to fixed points results for sum of operators and applications. (with C. Barroso). *Nonlinear Anal.* 60 (2005), no. 4, 625–650.
- Weak convergence under nonlinearities. (with D. Moreira). *An. Acad. Brasil. Ciênc.* 75 (2003), no. 1, 9–19.

Preprints

- Free boundary variational problems involving singular weights. (with J. Lamboley and Y. Sire).
- Limiting PDE with infinite order elliptic degeneracy (with I. Sousa and R. Leitão).
- On the geometry of multilinear forms (with D. Pellegrino and W. Cavalcante).
- A primer on free boundary problems (book project sponsored by De Gruyter publishing house).

Books and lecture notes

- Fundamentos de análise funcional. (with G. Botelho and D. Pellegrino). *Textos Universitários*, Soc. Brasil. Matem. +313pp.
- Análise de EDPs elípticas. Preprint +114pp.
- Um convite à análise geométrica de EDPs elípticas de 2a ordem. *IV Escola Brasileira de Equações Diferenciais*. João Pessoa, Aug, 2011 +56pp.
- Introdução à teoria de regularidade elíptica: uma visão geométrica. *III ENAMA*. Universidade de Maringá, Nov 2009, +41pp.
- Elliptic regularity and free boundary problems: an introduction *IMPA Mathematical Publications*, 2007. +205pp. ISBN 978-85-244-0252-4.