

Rayssa Caju

CONTACT INFORMATION

Department of Mathematics
Federal University of Paraíba
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RESEARCH

Geometric Analysis, Differential Geometry, Partial Differential Equations
I am currently interested in three main research themes: conformal geometry, minimal surfaces, and the study of elliptic problems via Morse theory.

APPOINTMENTS

Federal University of Paraíba, Paraíba – Brazil
2020 – : Posdoctoral researcher

University of Chicago, Chicago – USA
2018 – 2021 : Visiting Posdoctoral Researcher
• Supervisor: André Arroja Neves

Federal Rural University of Pernambuco, Recife –Brazil
2017: Assistant Professor

EDUCATION

Federal University of Paraíba, Paraíba – Brazil

2014 – 2018 : P.h.D in Mathematics

Thesis title: “Qualitative properties of positive singular solutions to nonlinear elliptic systems with critical exponent”

- Advisor: João Marcos Bezerra do Ó
- Co-advisor: Fernando Codá Marques

Princeton University, Princeton – USA

2017 – 2018 : Visiting Student Research Collaborator

- Supervisor: Fernando Codá Marques

Federal University of Paraíba, Paraíba – Brazil

2013 – 2014: Mathematics M.S.

- Advisor: João Marcos Bezerra do Ó

Federal University of Paraíba, Paraíba – Brazil

2010 – 2013: Mathematics B.S.

GRANTS AND SCHOLARSHIPS

Concurso FONDECYT de Iniciación en Investigación 2023, (Applied).

FAPESq *Postdoctoral Fellowship*, 2021–2023.

CAPES *PDSE Ph.D. Fellowship*, 2017–2018.

CAPES *Ph.D. Fellowship*, 2014–2018.

CNPq *M.Sc. Fellowship*, 2013–2014.

CNPq *Undergraduate Research* 2010 – 2012.

AWARDS

Prêmio PRPG de Teses e Grande Prêmio Lenilde Duarte de Sá de Tese, 2018

Prize awarded for the best Ph.D. thesis of Federal University of Paraíba, among all STEM fields.

PUBLICATIONS AND
PREPRINTS

Andrade, J.H., Caju, R., do Ó, J.M., Ratzkin, J. and Silva Santos, A. *Constant Q-curvature metrics with Delaunay ends: The nondegenerate case*. arXiv:2110.05234 [math.DG], 2021. To appear in Annali della Scuola Normale Superiore di Pisa.

Caju, R., do Ó, J.M. and Silva Santos, A. *Singular solutions to Yamabe-type systems with prescribed asymptotics*. arXiv:2009.01787v1 [math.AP], 2020 (Preprint). To appear in Journal of Differential Equations.

Caju, R. and Gaspar, P. *Solutions of the Allen-Cahn equation on closed manifolds in the presence of symmetry*, arXiv:1906.05938v1 [math.DG], 2019. To appear in Communications in Analysis and Geometry.

Caju, R., Gaspar, P., Guaraco, M.A. and Matthiesen, H. *Ground states of semilinear elliptic equations with applications to the Allen-Cahn equation on the sphere*. Calculus of Variations and Partial Differential Equations 61.2 (2022): 1-35.

Caju, R., do Ó, J.M. and Santos, A.S. *Qualitative properties of positive singular solutions to nonlinear elliptic systems with critical exponent*, Annales de l'Institut Henri Poincaré C, Analyse non linéaire. Vol. 36. No. 6. p. 1575–1601, 2019.

PUBLICATIONS IN
PREPARATION

Andrade, J.H., Caju, R., do Ó, J.M., Ratzkin, J. and Silva Santos, A. *Constant Q-curvature metrics with Delaunay ends: The spherical case*. In preparation.

Andrade, J.H., Caju, R., do Ó, J.M., Ratzkin, J. and Silva Santos, A. *Moduli space theory for complete, constant Q-curvature metrics on finitely punctured balls*. In preparation.

Andrade, J.H., Caju, R., do Ó, J.M., Ratzkin, J. and Silva Santos, A. *Balancing diagrams for Pohozaev invariants*. In preparation.

Caju, R., Cruz, T. and Silva Santos, A. *Existence and obstructions for the Q-curvature on compact manifolds*. In preparation.

Caju, R., Gaspar, P. and Xavier, M. *Variational constructions for a Peierls-Nabarro energy on the sphere*, In preparation.

Caju, R., Gaspar, P. and Lima, V. *Gluing construction for the abelian Yang-Mills-Higgs equation and nondegenerate minimal submanifolds*. In preparation.

Caju, R. *Asymptotic behavior of the σ_2 -Yamabe equation*. In preparation.

INVITED TALKS

IV Congresso Brasileiro de Jovens Pesquisadores em Matemática Pura, Aplicada e Estatística, Thematic Session, October 2022.

Celebrating Women in Mathematics, Geometry Session, May 2022.

XI Escola de Verão da Universidade Federal de Sergipe, March 2022.

Seminários em Métodos Matemáticos - Universidade Federal do Rio de Janeiro, February 2022.

Geometric Analysis Seminar, GeoTop - Copenhagen Center for Geometry & Topology, January 2022.

9th Workshop on Nonlinear Partial Differential Equations, Functional and Geometric Analysis, December 2021.

Partial Differential Equations Seminar, IIMECC - UNICAMP, November 2021.

Geometria do Nordeste Webinar, October 2021.

Differential Equation Seminar, Universidad de Chile, October 2021. (Remotely)

Seminars, Universidade Federal do Rio Grande do Sul, September 2021. (Remotely)

Webinar de Jovens Pesquisadores em EDP e Matemática Aplicada, August 2021 (Remotely)

Obserminar, University of Wurzburg, July 2021 (Remotely)

Analysis Seminar, Universidade de Brasília, 2021 (Remotely)

Webinar on Partial Differential Equations and Geometric Analysis -UFPB, 2021 (Remotely)

Geometric Analysis Seminar - Universidade Federal do Ceará, 2021 (Remotely)

XIII Summer Workshop in Mathematics- Universidade de Brasília, 2021 (Remotely)

Webinário de Jovens Pesquisadores em Matemática Pura, Aplicada e Estatística (WebJME), November 2020. (Remotely)

II Encontro de Geometria Diferencial da UFS, November 2020. (Remotely)

Seminário de Análise Geométrica, Universidade Federal de Alagoas, September 2020. (Remotely)

Seminário de Matemática UFPB, João Pessoa, August 2019.

2 Encontro em Geometria Diferencial no Rio Grande do Sul, Porto Alegre, August 2019.

XI Brazilian-Italian Workshop in Nonlinear Differential Equations, Varese, 29 July – 2 August 2019.

Geometric analysis seminar, University of Chicago, March 2019.

Workshop for Women in Differential Equations, UFABC – Brazil, July 2018

Analysis and PDEs Seminar, PUC-Rio – Brazil, May 2018

SUBMITTED TALKS

VII Workshop in Nonlinear PDE's and Geometric Analysis, UFPB – Brazil, February 2018

X ENAMA- Encontro Nacional de Análise Matemática e Aplicações, UFF, 2016.

VI Simpósio Nacional/Jornadas de Iniciação Científica, IMPA, 2012.

CONTRIBUTIONS

Organizer of the Cibercoloquio Latinoamericano de Matematicas.
A large-scale online colloquium for the global Spanish and Portuguese-speaking mathematical community. More informations in www.cibercoloquio.com.

TEACHING

Lecturer for Functional Analysis, Graduate Course, January-March 2022
The Summer School in Mathematics at UFPB, João Pessoa - Brazil

Lecturer for Algebra I, 2017 (two sections)

Assistant Professor at UFRPE, Recife – Brazil

Teaching Assistant for *Differentiable Manifolds*, First Semester of 2015
UFPB, João Pessoa - Brazil

Teaching Assistant for *Multivariable Calculus*, Second Semester of 2014
UFPB, João Pessoa - Brazil

Teaching Assistant for *Multivariable Calculus*, First Semester of 2014
UFPB, João Pessoa - Brazil

Teaching Assistant for *Multivariable Calculus*, Second Semester of 2013
UFPB, João Pessoa - Brazil

CONFERENCES
ATTENDED

RTG Conference on Geometric Analysis and Diversity in Mathematics, Princeton University, Princeton - 2019

Workshop for Women in Differential Equations, UFABC – Brazil, 2018

VIII Workshop on Differential Geometry, UFAL, Maceió – 2018 X School of Differential Geometry, UFPB, João Pessoa – 2018

2018 Taipei Conference on Geometric Invariance and Partial Differential Equations, Academia Sinica, Taipei – 2018

Maryland Analysis and Geometry Atelier, University of Maryland – 2017

X ENAMA - Encontro Nacional de Análise Matemática e Aplicações, UFF – 2016

XIX School on Differential Geometry, IMPA– 2016

29º Colóquio Brasileiro de Matemática, IMPA– 2013

IX Nonlinear Differential Equation, UFPB– 2012

VI Simpósio Nacional/ Jornadas de Iniciação Científica, IMPA – 2012

IV EBED - Escola Brasileira de Equações Diferenciais Parciais, UFPB– 2011

XIX ENIC - Encontro Nacional de Iniciação Científica, UFPB – 2011

V Bienal da Sociedade Brasileira de Matemática, UFPB – 2010.