

**Curriculum Vitae**  
Fernando Codá Marques  
February 16<sup>th</sup>, 2018

**Personal information**

Name: Fernando Codá Marques  
Date of birth: October 8<sup>th</sup> of 1979  
Nationality: Brazilian

**Address**

Princeton University  
Fine Hall, Washington Road  
Princeton NJ 08544-1000 USA  
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**Education**

2000-2003 **Ph.D. in Mathematics**

Cornell University, C. U., Ithaca/NY USA

Thesis Advisor : José F. Escobar

Title : *Existence and compactness theorems on conformal deformations of metrics*

Scholarship from : Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)

1998-1999 **Mathematics M.S.**

IMPA, Rio de Janeiro/RJ Brazil

Scholarship from : Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)

1996-1999 **Mathematics B.S.**

UFAL - Universidade Federal de Alagoas

Maceió, Alagoas - Brazil

## **Employment history**

2003-2007	Assistant Professor, IMPA
2007-2010	Associate Professor, IMPA
2010-2014	Professor, IMPA
2014-	Professor, Princeton University

## **Visiting Positions**

2018	Invited as Distinguished Visitor Professor, IAS, Princeton - Special Program: "Variational Methods in Geometry"
2017	Dean's Distinguished Visiting Professor, Fields Institute, Toronto, Canada
2013-2014	École Polytechnique, École Normale Supérieure and Université Paris-Est Marne la Vallée, Paris, France
2012	Institut Henri Poincaré, Paris, France (1 month)
2011	Stanford University, USA (2 months)
2011	Institut Fourier, Grenoble, France (1 month)
2010	Stanford University, USA (3 months)
2009	Stanford University, USA (1 month)
2008	Member of the Institute for Advanced Study (IAS), USA (3 months)
2008	Princeton University, USA (1 month)
2005-2006	Stanford University, USA (post-doc)

## **Research interests**

Mathematics  
Differential Geometry  
Geometric Partial Differential Equations  
General Relativity

## **Honors and Awards**

- 2018 Fellow of the American Mathematical Society
- 2016 Oswald Veblen Prize, American Mathematical Society
- 2014 Plenary Speaker, International Congress of Mathematicians  
- ICM 2014, Seoul (Korea)
- 2014 Member of the Brazilian Academy of Sciences, Brazil
- 2012 TWAS Prize in Mathematics
- 2012 Ramanujan Prize - ICTP, Abel Memorial Fund and IMU
- 2012 UMALCA Prize, Union Matematica de America Latina y el Caribe
- 2011 TWAS-ROLAC Young Scientist Prize
- 2011 Affiliated Member of the TWAS  
- Academy of Sciences for the Developing World, TWAS
- 2010 Invited Speaker, International Congress of Mathematicians  
- ICM 2010, Hyderabad (India)
- 2001 Battig Prize, Cornell University, USA.

## **Special Lectures**

- 2017 Jane and Roland Blumberg Lecture, University of Texas at Austin, USA
- 2016 Evans Lectures, Cornell University, USA
- 2016 Zygmund-Calderón Lectures, University of Chicago, USA
- 2016 Chern Lectures, Tsinghua University, Beijing, China
- 2016 D'Atri Memorial Lectures, Rutgers University, USA
- 2015 Distinguished Lectures, University of California, Irvine, USA
- 2014 Joseph Fels Ritt Lectures, Columbia University, USA
- 2014 S. Lojasiewicz Lecture, Jagiellonian University, Krakow, Poland

- 2013 Hadamard Lectures, Institut Henri Poincaré, Paris, France
- 2013 Yamabe Lectures, Northwestern University, USA
- 2013 Barrett Memorial Lectures, University of Tennessee - Knoxville, USA

### **Editorial boards**

Annales de l'Institut Fourier  
 Bulletin of the Brazilian Mathematical Society  
 Journal of Differential Geometry  
 Journal de l'École Polytechnique  
 Mathematische Annalen

### **Scientific Committees**

- 2018 Modern Trends in Differential Geometry,  
 - ICM Satellite Conference, São Paulo, Brazil
- 2017 Special Session in Geometric Analysis,  
 - Mathematical Congress of the Americas, Montreal, Canada
- 2011- 2017 Annual Workshop on Differential Geometry, Maceió, Brazil
- 2010- 2014 Scientific Activities Committee (CAC), IMPA - Rio de Janeiro, Brazil
- 2014 18th Brazilian School on Differential Geometry, Brasília, Brazil
- 2013 ICM 2014 Geometry Session Panel, Seoul - Korea
- 2010- 2013 Technical Scientific Board (CTC), IMPA - Rio de Janeiro, Brazil
- 2013 Differential Geometry and Analysis Conference, IHP - Paris, France
- 2013 29th Brazilian Colloquium of Mathematics, IMPA - Rio de Janeiro, Brazil
- 2012 17th Brazilian School on Differential Geometry, Manaus, Brazil

## Grant Support

- 2015-        NSF Grant DMS-1509027
- 2012- 2015  Universal Project, CNPq, Brazil
- 2012- 2014  Young Scientist, FAPERJ, Rio de Janeiro - Brazil
- 2007- 2013  Research Fellowship, CNPq, Brazil
- 2010- 2012  Universal Project, CNPq, Brazil
- 2009- 2011  Young Scientist, FAPERJ, Rio de Janeiro - Brazil

## Preprints

- (with Neves, A. and Song, A.), “Equidistribution of minimal hypersurfaces for generic metrics”, *arXiv:1712.06238 [math.DG]*, (2017)
- ( with Bessieres, L., Besson, G., and Maillot, S.) “Deforming 3-manifolds of bounded geometry and uniformly positive scalar curvature”, *arXiv:1711.02457 [math.DG]*
- (with Ketover, D. and Neves, A.), “The catenoid estimate and its geometric applications”, *arXiv:1601.04514 [math.DG]*, (2016)

## Publications

- (with Irie, K. and Neves, A.), “Density of minimal hypersurfaces for generic metrics”, *arXiv:1710.10752* (2017), to appear in *Annals of Mathematics*
- (with Liokumovich, Y. and Neves, A.), “Weyl law for the volume spectrum”, *arXiv:1607.08721* (2016), to appear in *Annals of Mathematics*
- (with Neves, A.), “Existence of infinitely many minimal hypersurfaces in positive Ricci curvature”, *Invent. Math.* **209** no.2 (2017) 577–616
- (with Neves, A.), “Morse index and multiplicity of min-max minimal hypersurfaces”, *Cambridge Journal of Math.* **4** no.4 (2016) 463–511

- (with Agol, I. and Neves, A.), “Min-max theory and the energy of links”, *Journal of the Amer. Math. Soc.* **29** (2016) no. 2, 561–578.
- (with Neves, A.) “Min-max theory of minimal surfaces and applications”, Mathematical Congress of the Americas, 13–25, *Contemp. Math.*, **656**, Amer. Math. Soc. (2016)
- (with Neves, A.), “The Willmore conjecture”, *Jahresber. Dtsch. Math.-Ver.*, **116** (2014) no. 4, 201–222.
- “Minimal surfaces - variational theory and applications”, *Proceedings of the International Congress of Mathematicians - Seoul, Korea* (2014)
- (with Neves, A.), “Min-max theory and the Willmore conjecture”, *Annals of Mathematics*, **179** 2 (2014), pp. 683–782.
- (with Neves, A.), “Applications of Almgren-Pitts Min-max theory”, *Current Developments in Mathematics 2013*, (2014) pp 1–71.
- (with Neves, A.), “Min-max theory, Willmore conjecture and the energy of links”, *Bull. Braz. Math. Soc. (N.S.)* **44** (2013), no. 4, 681–707.
- (with Neves, A.), “Rigidity of min-max minimal spheres in three-manifolds”, *Duke Math. J.*, **161** 14 (2012), pp. 2725–2752.
- “Deforming three-manifolds with positive scalar curvature”, *Annals of Mathematics*, **176**, (2012), pp. 815–863
- (with Brendle, S. and Neves, A.) “Deformations of the hemisphere that increase scalar curvature”, *Invent. Math.*, **185**, (2011), pp. 175–197
- (with S. Brendle), “Recent progress on the Yamabe Problem”, *Surveys in Geometric Analysis and Relativity*, book dedicated to the 60th birthday of Richard Schoen, (2011).
- (with Brendle, S.) “Scalar curvature rigidity of geodesic balls in  $S^n$ ”, *Journal of Differential Geometry*, **88**, 3, (2011), pp 379–394
- “Scalar curvature, conformal geometry, and the Ricci flow with surgery”, *Proceedings of the International Congress of Mathematicians - Hyderabad, India* (2010)
- “Uma introdução ao Fluxo de Ricci”, book published for *XVI Differen-*

*tial Geometry School*, São Paulo - Brazil (in Portuguese).

- “Blow-up examples for the Yamabe Problem”, *Calculus of Variations and Partial Differential Equations*, **36**, (2009), pp. 377-397

- (with Brendle, S.) “Blow-up phenomena for the Yamabe equation II”, *Journal of Differential Geometry*, **81**, (2009), pp. 225-250

- (with Khuri, M. and Schoen, R.) “A Compactness Theorem for the Yamabe Problem”, *Journal of Differential Geometry*, **81**, (2009), pp. 143-196

- “Isolated singularities of solutions to the Yamabe equation”, *Calculus of Variations and Partial Differential Equations*, **32**, (2008), pp. 349-371

- “Conformal deformations to scalar-flat metrics with constant mean curvature on the boundary”, *Communications in Analysis and Geometry*, **15**, (2007), pp. 381-405

- “On the mathematical work of José F. Escobar”, *Matemática Contemporânea*, **29**, (2005)

- “A priori estimates for the Yamabe problem in the non-locally conformally flat case”, *Journal of Differential Geometry*, **71** n. 2, (2005), pp. 315-346

- “Existence results for the Yamabe problem on manifolds with boundary”, *Indiana University Mathematics Journal*, **54** n. 6, (2005), pp. 1599-1620

- (with Alencar, H. and do Carmo, M.) “Upper bounds for the first eigenvalue of the operator  $L_r$  and some applications”, *Illinois Journal of Mathematics*, **45** n. 3, (2001), pp. 851-863.

### **Supervised Ph.D. Dissertations**

2017 Jhovanny Muñoz, IMPA-Brazil

2016 Abraão Mendes, Federal University of Alagoas (UFAL)-Brazil  
- Joint Supervision

2016 Marco Guaraco, IMPA-Brazil

- 2015 Rafael Montezuma, IMPA-Brazil
  - 2016 CAPES Thesis Prize
  - 2016 Carlos Gutiérrez Thesis Prize
- 2015 Cristina Levina, IMPA-Brazil
- 2014 Lucas Ambrozio, IMPA-Brazil
  - 2015 CAPES Thesis Prize
  - 2015 Carlos Gutiérrez Thesis Prize
- 2011 Ivaldo Paz Nunes, IMPA-Brazil
  - 2012 CAPES Thesis Prize
- 2009 Almir Rogerio Silva Santos, IMPA-Brazil
- 2009 Sergio Almaraz, IMPA-Brazil.

### **Invited Talks**

- 2017 Schock Prize Symposium, Institut Mittag-Leffler, Stockholm, Sweden
- 2017 Workshop on General Relativity and AdS/CFT, Fields Institute, Canada
- 2017 Colloquium at the University of Toronto, Canada
- 2017 Colloquium at McMaster University, Canada
- 2017 Geometry of Manifolds, Simons Center, Stony Brook, USA
- 2017 Third Pacific Rim Mathematical Association (PRIMA) Conference  
Plenary Speaker, Oaxaca, Mexico
- 2017 Third Pacific Rim Mathematical Association (PRIMA) Conference  
Differential Geometry Session, Oaxaca, Mexico
- 2017 Advances in Geometric Analysis, ETH, Zürich, Switzerland
- 2017 JDG Conference 50th Birthday, Harvard University, USA
- 2017 Georgia International Topology Conference, Athens, USA
- 2017 Invited Address at AMS Sectional Meeting, CUNY, USA



2017 Metro Area Differential Geometry Seminar, Johns Hopkins, USA  
2016 Department Colloquium, Princeton University, USA  
2016 XIX Differential Geometry School, IMPA - Brazil  
2016 Seminar at IAS, Princeton, USA  
2016 31st Geometry Festival, Princeton University, USA  
2015 Geometric non-linear analysis conference, ETH, Zürich, Switzerland  
2015 WHIFF Lecture, Princeton University, USA  
2015 Princeton-Rutgers Joint Seminar in Geometric PDEs, Rutgers  
2015 F&F Workshop on Geometric Analysis, Frankfurt, Germany  
2015 Congress of Real Sociedad Matematica Española, Granada, Spain  
2015 Southern California Geometric Analysis Seminar, San Diego, USA  
2014 XVIII Differential Geometry School, Brasilia - Brazil  
2014 Colloquium at SUNY Stony Brook, USA  
2014 Colloquium at Lehigh University, USA  
2014 JDG Conference, Harvard University, USA  
2014 ICTP 50th Anniversary Conference, Trieste, Italy  
2014 Rutgers University, USA  
2014 Geometric Analysis Conference, IST - Lisbon, Portugal  
2014 ETH (mini course), Zürich, Switzerland  
2014 Séminaire du Laboratoire Jacques-Louis Lions, Jussieu, Paris  
2014 Colloquium at Université Lyon, Lyon, France  
2014 Colloquium at University of Cyprus, Nicosia, Cyprus  
2014 Colloquium at Université de Lorraine, Nancy  
2014 ICMC Summer Meeting on Differential Equations, São Carlos, Brazil  
2014 Séminaire Parisien d'Optimisation, Institut Henri Poincaré  
2014 Geometry Day, Università degli Studi dell'Insubria, Como, Italy  
2013 Special Day on Geometry and PDE, Columbia University  
2013 TWAS 24th General Meeting, Buenos Aires, Argentina  
2013 Analysis and Geometry Seminar, Paris 6

- 2013 Colloquium at Institut Fourier, Grenoble
- 2013 “The Willmore functional and the Willmore conjecture” Mini-workshop Oberwolfach -Germany
- 2013 Park City Mathematics Institute, Geometric Analysis (minicourse), USA
- 2013 Mathematical Congress of the Americas, Guanajuato, Mexico
- 2013 Plenary lecture, 29th Brazilian Colloquium of Mathematics, IMPA Rio de Janeiro, Brazil
- 2013 Encounters in Geometry, Cabo Frio - Brazil
- 2012 IMPA 60 Years, IMPA, Rio de Janeiro - Brazil
- 2012 Henri Poincaré Interdisciplinary Colloquium, IMPA, Rio de Janeiro - Brazil
- 2012 3rd Indo-Brazilian Symposium in Mathematics, IMPA, Rio de Janeiro - Brazil
- 2012 Geometric PDEs Conference, IHP - Paris, France
- 2012 Conformal and Kahler Geometry Program, minicourse, IHP - Paris, France
- 2012 Ramanujan Prize Lecture, ICTP - Trieste, Italy
- 2012 Workshop on the Willmore conjecture, University of Granada, Spain
- 2012 Conference Geometric Measure Theory, Albert Einstein Institute Potsdam, Germany
- 2012 ICTP-ESF Conference on Geometric Analysis, ICTP-Trieste, Italy
- 2012 Geometrie Workshop, Oberwolfach - Germany
- 2012 University of Zurich, Switzerland
- 2012 University of Warwick, UK
- 2012 Stanford University, USA
- 2012 Bay Area Differential Geometry Seminar, Stanford University, USA
- 2012 Miami University, USA
- 2012 27th Annual Geometry Festival, Duke University, USA
- 2012 UMALCA Prize Lecture, Cordoba, Argentina
- 2012 IV CLAM Latin American Congress of Mathematicians, Cordoba, Argentina
- 2012 XVII Differential Geometry School, Manaus - Brazil
- 2012 II EIMAN, UFS, Aracaju, Brazil
- 2012 II Workshop on Differential Geometry, UFAL, Maceio, Brazil

- 2011 Chern Centennial Conference, MSRI, Berkeley, USA (November)
- 2011 Beijing International Center for Mathematical Research, Peking University, China
- 2011 Geometric Analysis, Edinburgh, Scotland
- 2010 PRIMA Conference on Geometric Analysis, University of British Columbia  
Vancouver, Canada
- 2010 XVI Differential Geometry School, Sao Paulo - Brazil
- 2010 Imperial College, London, England
- 2010 University of Warwick, England
- 2010 Geometrie Workshop, Oberwolfach - Germany
- 2010 University of Texas, Austin, USA
- 2010 Stanford University, Stanford, USA
- 2010 University of Texas, Austin, USA
- 2009 III CLAM Latin American Congress of Mathematicians, Santiago, Chile
- 2009 International Conference - Spectral Theory and Geometry, Grenoble, France
- 2009 TWAS-ROLAC 5th Young Scientist Conference, Rio de Janeiro, Brazil
- 2009 Bay Area Differential Geometry Seminar, Stanford University, USA
- 2009 Duke University, USA
- 2008 City University of New York, USA
- 2008 University of Pennsylvania, USA
- 2008 Princeton University, USA
- 2008 Institute for Advanced Study, Princeton, USA
- 2008 XV Differential Geometry School, Fortaleza - Brazil
- 2008 Ricci flow and related topics, Institut Henri Poincare (IHP), Paris - France
- 2007 Loss of compactness in nonlinear PDE : Recent trends,  
at Banff International Research Station, Canada
- 2007 International Congress on Minimal and Constant Mean  
Curvature Surfaces, Buzios - Brazil
- 2006 Workshop on Geometric and Nonlinear Analysis,  
at Banff International Research Station, Canada
- 2006 XIV Differential Geometry School, Salvador - Brazil

- 2006 Duke University, USA
- 2006 Ohio State University, USA
- 2006 Princeton University, USA
- 2006 University of California, San Diego, USA
- 2006 International Conference in Memory of José Escobar  
- Chepe, Universidad del Valle, Cali - Colombia
- 2005 25<sup>th</sup> Brazilian Colloquium of Mathematics, Rio de Janeiro - Brazil
- 2004 XIII Differential Geometry School, São Paulo - Brazil
- 2004 Second Latin American Congress of Mathematicians  
(UMALCA), Cancun - Mexico
- 2003 24<sup>th</sup> Brazilian Colloquium of Mathematics, Rio de Janeiro - Brazil
- 2002 XII Differential Geometry School, Goiânia - Brazil
- 1998 22nd Brazilian Colloquium of Mathematics, Rio de Janeiro - Brazil