

## Ricardo Augusto E. Mendes

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### ADDRESS AND CONTACT INFORMATION

Department of Mathematics  
University of Oklahoma  
Norman, OK 73019-3103

*Email:* ricardo.mendes@ou.edu  
*Website:* <https://math.ou.edu/~rmendes>

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### RESEARCH INTERESTS

My main interest is Riemannian Geometry. More specifically: isometric group actions, singular Riemannian foliations, and their relationship to Classical Invariant Theory; algebraic curvature operators, in particular different notions of positivity; and minimal surfaces.

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### EDUCATION

**University of Pennsylvania**, Philadelphia, PA, USA

Ph.D. in Mathematics, May 2011.

- Thesis: Equivariant tensors on polar manifolds
- Advisor: Wolfgang Ziller

**State University of Campinas**, Campinas, Brazil

M.Sc. in Mathematics, 2006.

- Thesis: Geometric Invariant Theory and Representations of Quivers
- Advisor: Marcos Jardim

B.Sc. in Mathematics, 2004.

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### POSITIONS

Assistant Professor at the University of Oklahoma, Norman, OK, USA since Fall 2019

Postdoctoral fellow at Universität zu Köln, Köln, Germany Summer 2017 to Summer 2019

Postdoctoral fellow at Universität Münster, Münster, Germany Summer 2014 to Spring 2017

Visiting assistant professor at the University of Notre Dame, Notre Dame, IN, USA Fall 2011 to Spring 2014

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### HONORS AND AWARDS

NSF standard grant DMS-2005373, National Science Foundation, 2020–2023.

Postdoctoral grant, Deutsche Forschungsgemeinschaft (DFG), Germany, 2016–2019.

Carlitz-Zippin Prize, Department of Mathematics, University of Pennsylvania, 2011.

Benjamin Franklin Fellowship, Department of Mathematics, University of Pennsylvania, 2006–2011.

Masters Scholarship, Brazilian National Council of Scientific and Technological Development (CNPq), Brazil, 2005–2006.

Undergraduate Research Scholarship, Foundation for Research Support of the State of São Paulo (FAPESP), Brazil, 2001–2004.

15. Mendes, R. A. E.  
*Lifting isometries of orbit spaces*,  
submitted for publication.
14. Mendes, R. A. E., Radeschi, M.  
*Laplacian algebras, manifold submetries and the Inverse Invariant Theory Problem*,  
to appear in GAFA.
13. Bettiol, R., Kummer, M., Mendes, R. A. E.  
*Convex Algebraic Geometry of Curvature Operators*,  
submitted for publication.
12. Gorodski, C., Lange, C., Lytchak, A., Mendes, R. A. E.  
*A diameter gap for quotients of the unit sphere*,  
submitted for publication.
11. Gorodski, C., Mendes, R. A. E., and Radeschi, M.  
*Robust index bounds for minimal hypersurfaces of isoparametric submanifolds and symmetric spaces*,  
Calc. Var. Partial Differential Equations 58 (2019), no. 4, Art. 118, 25 pp.
10. Mendes, R. A. E., and Radeschi, M.  
*Virtual immersions, and a characterization of symmetric spaces*,  
Ann. Global Anal. Geom. 55 (2019), no. 1, 43–53.
09. Bettiol, R., and Mendes, R. A. E.  
*Sectional curvature and Weitzenböck formulae*,  
to appear in Indiana University Mathematics Journal.
08. Mendes, R. A. E., and Radeschi, M.  
*Virtual immersions and minimal hypersurfaces in compact symmetric spaces*,  
to appear in Calc. Var. Partial Differential Equations.
07. Mendes, R. A. E., and Radeschi, M.  
*Singular Riemannian foliations and their quadratic basic polynomials*,  
Transform. Groups 25 (2020), no. 1, 251–277.
06. Bettiol, R., and Mendes, R.  
*Strongly non-negative curvature*,  
Math. Ann. 368 (2017), no. 3-4, 971–986.
05. Mendes, R. A. E., and Radeschi, M.  
*A Slice Theorem for singular Riemannian foliations, with applications*,  
Trans. Amer. Math. Soc. 371 (2019), no. 7, 4931–4949.
04. Bettiol, R., and Mendes, R. A. E.  
*Flag manifolds with strongly positive curvature*,  
Math. Z. 280 (2015), no. 3-4, 1031–1046.
03. Bettiol, R., and Mendes, R. A. E.  
*Strongly positive curvature*,  
Ann. Global Anal. Geom. 53 (2018), no. 3, 287–309.
02. Mendes, R. A. E.  
*Extending tensors on polar manifolds*,  
Math. Ann. 365 (2016), no. 3-4, 1409–1424.
01. Mendes, R. A. E.  
*Equivariant tensors on polar manifolds*,  
PhD dissertation (2011).

TALKS AND PRESENTATIONS	<i>The isometry group of spherical quotients</i> CUNY Geometric Analysis Seminar (online)	June 2020
	<i>The isometry group of spherical quotients</i> Virtual seminar on geometry with symmetries (online)	May 2020
	<i>Singular Riemannian foliations, manifold submetrics, and Laplacian algebras</i> Algebra and Representation Theory Seminar University of Oklahoma, Norman, OK, USA	March 2020
	<i>Convex Algebraic Geometry of Riemann Curvature Operators</i> Topology Seminar University of Arkansas, Fayetteville, AR, USA	March 2020
	<i>The isometry group of spherical quotients</i> Geometry and Topology Seminar University of Oklahoma, Norman, OK, USA	February 2020
	<i>Symmetry, matrix groups, and a gap in the diameter of orbit spaces</i> Colloquium Wichita State University, Wichita, KS, USA	November 2019
	<i>A diameter gap for quotients of the units sphere</i> Algebra and Representation Theory Seminar University of Oklahoma, Norman, OK, USA	October 2019
	<i>Convex Algebraic Geometry of Riemannian Curvature Operators</i> Geometry and Topology Seminar University of Oklahoma, Norman, OK, USA	September 2019
	<i>Singular Riemannian Foliations — Metric and Algebraic Aspects</i> Workshop on Singular Foliations KU Leuven, Leuven, Belgium	May 2019
	<i>The Real Algebraic Geometry of Riemannian curvature conditions</i> Düsseldorf Doctoral Research Seminar in Pure Mathematics Heinrich Heine Universität Düsseldorf, Düsseldorf, Germany	May 2019
	<i>A diameter gap for quotients of the unit sphere</i> Felix Klein Seminar University of Notre Dame, Notre Dame, IN, USA	April 2019
	<i>Singular Riemannian foliations, manifold submetrics, and Laplacian algebras</i> Geometry Seminar Max Planck Institute for Mathematics, Bonn, Germany	January 2019
	<i>Diameter of quotients of the sphere by isometric group actions</i> Geometry Oberseminar University of Münster, Münster, Germany	November 2018
	<i>Diameter of quotients of the sphere by isometric group actions</i> New trends and open problems in Geometry and Global Analysis Castle Rauischholzhausen, near Marburg, Germany	August 2018
	<i>Diameter of quotients of the sphere by isometric group actions</i> Modern Trends in Differential Geometry University of São Paulo, São Paulo, Brazil	July 2018
	<i>Robust index bounds for minimal hypersurfaces in compact symmetric spaces and isoparametric submanifolds</i> Geometry Seminar	March 2018

University of São Paulo, São Paulo, Brazil	
<i>Virtual immersions and minimal hypersurfaces in compact symmetric spaces</i> 20th School of Differential Geometry João Pessoa, Brazil	March 2018
<i>Minimal hypersurfaces in compact symmetric spaces</i> Analysis Seminar University of Warwick, Coventry, UK	November 2017
<i>Strongly positive curvature</i> Seminar "Differentialgeometrie und Analysis" Philipps-Universität Marburg, Marburg, Germany	October 2017
<i>Minimal hypersurfaces in compact symmetric spaces</i> Geometry Seminar University of São Paulo, São Paulo, Brazil	September 2017
<i>Invariant Theory without groups</i> Karcher Colloquium University of Oklahoma, Norman, OK, USA	August 2017
<i>Sectional curvature and the Weitzenböck formula</i> Geometry and Topology Seminar University of Oklahoma, Norman, OK, USA	August 2017
<i>Minimal hypersurfaces in compact symmetric spaces</i> Geometric Analysis Seminar University of Notre Dame, Notre Dame, IN, USA	August 2017
<i>Minimal hypersurfaces in compact symmetric spaces</i> Workshop on Curvature and Global Shape University of Münster, Münster, Germany	July 2017
<i>Minimal hypersurfaces in compact symmetric spaces</i> Lie Group Actions in Riemannian Geometry Dartmouth College, Hanover, NH, USA	June 2017
<i>Minimal hypersurfaces in compact symmetric spaces</i> Universität zu Köln, Cologne, Germany	June 2017
<i>Invariants of degree two</i> Universität zu Köln, Cologne, Germany	December 2016
<i>Invariant Theory of singular Riemannian foliations</i> State University of Campinas, Campinas, Brazil	September 2016
<i>Invariant Theory of singular Riemannian foliations</i> Radboud University, Nijmegen, Netherlands	April 2016
<i>Invariant Theory of singular Riemannian foliations</i> University of Pennsylvania, Philadelphia, PA, USA	April 2016
<i>Smooth functions constant on the leaves of singular Riemannian foliations</i> Universität zu Köln, Cologne, Germany	October 2015
<i>Smooth basic functions on singular Riemannian foliations</i> University of São Paulo, São Paulo, Brazil	September 2015
<i>Smooth basic functions on singular Riemannian foliations</i> IMPA, Rio de Janeiro, Brazil	August 2015
<i>Metrics with strongly positive curvature on flag manifolds</i>	February 2015

Penn State University, State College, PA, USA	
<i>Metrics with strongly positive curvature on flag manifolds</i>	December 2014
I Congresso Brasileiro de Jovens Pesquisadores em Matemática Pura e Aplicada University of São Paulo, São Paulo, Brazil	
<i>Strongly positive curvature</i>	June 2014
Workshop – Geometrie Mathematisches Forschungsinstitut Oberwolfach, Germany	
<i>Strongly positive curvature</i>	March 2014
AMS Southeastern Spring Sectional Meeting Special Session on Metric Geometry and Topology University of Tennessee, Knoxville, Knoxville, TN, USA	
<i>Strongly positive curvature</i>	October 2013
University of Notre Dame, Notre Dame, IN, USA	
<i>Strongly positive curvature</i>	June 2013
State University of Campinas, Campinas, Brazil	
<i>Curvature conditions as semi-algebraic sets</i>	June 2013
University of São Paulo, São Paulo, Brazil	
<i>Extending general tensors in polar manifolds</i>	March 2013
University of Waterloo, Waterloo, Canada	
<i>Extending metrics in polar manifolds</i>	July 2012
Utrecht University, Utrecht, Netherlands	
<i>Polar Representations and their Invariant Theory</i>	August 2010
State University of Campinas, Campinas, Brazil	
<i>Smoothness conditions on polar manifolds</i>	June 2009
State University of Campinas, Campinas, Brazil	

TEACHING  
EXPERIENCE

**University of Oklahoma**, Norman, OK, USA

- *Literacy course: Geometry of metric spaces* Spring 2020
- *Calculus IV* Spring 2020
- *Calculus IV* Spring 2020
- *Calculus I* Fall 2019

**University of Cologne**, Cologne, Germany

- *Elementary Differential Geometry* Winter 2018-2019

**University of Notre Dame**, Notre Dame, IN, USA

- *Calculus III* Spring 2014
- *Calculus II* Fall 2013
- *Linear Algebra and Differential Equations* Fall 2013
- *Linear Algebra and Differential Equations* Spring 2013
- *Linear Algebra* Fall 2012
- *Calculus II* Fall 2012
- *Calculus B* Spring 2012
- *Calculus I* Fall 2011

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SERVICE

Organization of events:

- Co-organizing the workshop “Symmetry and Geometry in the Great Southern Plains” at the U. of Oklahoma. January 2020.
- Organizing committee for Math Day at the University of Oklahoma, which consists of a day of math-themed competitions and events for about 350 high school students. November 2019.
- Organizing a semester-long reading seminar, “Geometric Invariant Theory”. University of Oklahoma, Fall 2019.
- Organizing a semester-long reading seminar, “Geodesic Flows”. Münster University, 2014-2015.
- Organizing a semester-long reading seminar, “Tarski’s Quantifier Elimination Theorem”. University of Notre Dame, 2014.
- Organizing a semester-long research seminar, “Graduating students seminar”. University of Pennsylvania, 2011.

Students:

- Supervising three undergraduate students at Universität zu Köln (Germany) in the writing of their bachelor’s thesis. Summer 2019.
- Participating in committee for three qualifying exams in the topic “Coxeter groups”. University of Notre Dame, 2011-2014.

Review:

- Refereeing manuscripts for the following journals: Proceedings of the London Mathematical Society, Mathematische Annalen, Transformation Groups, Analysis and Mathematical Physics.
- Reviewing articles for the AMS Mathematical Reviews (MathSciNet) since 2016.