

# Joseph Ansel Hoisington

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## Research Interests

Differential, Complex and Integral Geometry; Geometric Analysis.

## Employment

Postdoctoral Research and Teaching Associate, Mathematics Department, University of Georgia. 2019 - present

Lecturer, Department of Mathematics and Statistics, Smith College. 2018–2019 Academic Year

Post-bachelor fellow, Institute for Health Metrics and Evaluation, University of Washington 2009 - 2011.  
*Employed full-time as research staff in quantitative assessment of public health initiatives.*

## Education

Ph.D. Mathematics, University of Pennsylvania, 2018.  
Advisor: Christopher Croke

M.S. Mathematics, University of Illinois at Chicago, 2013.

B.S. Mathematics, University of Illinois at Urbana-Champaign, 2009.

## Publications

### *Research Articles*

*Calibrations and Energy-Minimizing Mappings of Rank-1 Symmetric Spaces.* Joseph Hoisington.  
ArXiv preprint. [arXiv:2112.03160](https://arxiv.org/abs/2112.03160) (2021)

*Hypersurfaces, Geodesics and Isoperimetric Inequalities in Cartan-Hadamard Manifolds.* Joseph Hoisington.  
*Submitted.* ArXiv preprint. [arXiv:2111.06860](https://arxiv.org/abs/2111.06860) (2021).

*Steiner's Formula and a Variational Proof of the Isoperimetric Inequality.* Joseph Hoisington.  
To appear, Bulletin of the London Mathematical Society. [arXiv:1909.06347](https://arxiv.org/abs/1909.06347) (2019)

*Symmetry and Isoperimetry for Riemannian Surfaces.* Joseph Hoisington and Peter McGrath.  
Calculus of Variations and Partial Differential Equations 61.1 (2022): 1-13.

*On the Total Curvature and Betti Numbers of Complex Projective Manifolds.* Joseph Hoisington.  
Geometry & Topology 26.1 (2022): 1-45.

*India's Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: an impact evaluation.* Lim, Stephen S., Dandona, L., Hoisington, J. et al. The Lancet 375.9730 (2010): 2009-2023.

## Expository Articles

*Making Matrices Better: The Geometry and Topology of Polar and Singular Value Decomposition.* DeTurck, Dennis; Elsaify, Amora; Gluck, Herman; Grossman, Benjamin; Hoisington, Joseph; Krishnan, Anusha; Zhang, Jianru. Notices of the AMS 64.8 (2017).

## Honors and Awards

Herb Wilf Memorial Prize for Outstanding Research and Teaching by a Graduate Student  
Department of Mathematics, University of Pennsylvania - December 2017

## Conference and Seminar Talks

Workshop on Integral and Metric Geometry. May 4th, 2022

Online Geometry Seminar. April 12th, 2022

Online Geometry Seminar. March 29th, 2022

Georgia Tech Analysis Seminar. March 16, 2022

North Carolina State University Geometry Seminar. October 8, 2021

Syracuse University Geometry Seminar. September 25, 2020

Convex, Discrete and Integral Geometry, Friedrich-Schiller-Universität Jena. September 19, 2019

University of Georgia Geometry Seminar. May 3, 2019

Joint Mathematics Meetings, Baltimore Maryland - Session on Differential Geometry. January 18, 2019

University of Maryland Geometry Seminar. December 3, 2018

Smith College Student Seminar. November 8, 2018

University of Massachusetts, Amherst Geometry and Topology Seminar. October 5, 2018

Lehigh University Conference on Geometry and Topology, Lehigh University. May 24-27, 2018

Graduate Student Intercollegiate Mathematics Seminar, Lehigh University. March 19, 2018

Geometry Seminar, Dartmouth College. March 13, 2018

Joint Mathematics Meetings, San Diego California - Session on Differential and Metric Geometry and Geometric Analysis. January 11, 2018

AMS Sectional Meeting, Denton Texas - Special Section on Differential Geometry of Smooth and Discrete Surfaces in Euclidean and Lorentz Spaces. September 9-10, 2017

## Conference and Seminar Organization

Organizer for the Georgia Topology Conference, Summer 2021

Organizer for the University of Georgia Geometry Seminar, Spring 2020 - Spring 2021

## Teaching Experience

### *Classes*

Instructor for Math 5001 Introduction to Mathematics for Elementary School Teachers, University of Georgia, Spring 2022

Supervisor for graduate independent study in complex and Kähler geometry, UGA, Fall 2020 and Spring 2022

Instructor for Math 1113 Precalculus, UGA, Fall 2021

Instructor for Math 8230 Riemannian Geometry, UGA, Spring 2021

Instructor for Math 2260 Calculus II, UGA, Spring 2021

Instructor for Math 2250 Calculus I, UGA, Fall 2019 and Fall 2020

Instructor for Math 545 Linear Algebra for Applied Mathematics, University of Massachusetts Amherst, Summer 2019

Instructor for Math 370 Topology, Smith College, Spring 2019

Instructor for Math 112 Calculus II, Smith College, Fall 2018 and Spring 2019

Instructor for Math 170 Ideas in Mathematics, University of Pennsylvania, Summer 2015 and Summer 2018

Grader for Math 601 Algebraic Topology and Math 350 Number Theory, UPenn, Spring 2018

Grader for Math 600 Differential Topology, UPenn, Fall 2017

TA for Math 240 Basic Linear Algebra and ODE, UPenn, Spring 2016 and Fall 2014

TA for Math 202 Introduction to Proof in Analysis, UPenn, Fall 2015

TA for Math 241 Basic PDE, UPenn, Spring 2015

TA for Stat 101 Basic Statistics, University of Illinois at Chicago, Spring and Summer 2013

TA for Math 220 Differential Equations, UIC, Fall 2012

Instructor for Math 090 Algebra, UIC, Summer 2012

TA for Math 180 Calculus I, UIC, Spring 2012

TA for Math 090 Algebra, UIC, Fall 2011

### *Teaching Awards and Recognition*

Graduate Fellow for Teaching Excellence

Center for Teaching and Learning, University of Pennsylvania - 2016-2017 Academic Year

Departmental Teaching Award

Mathematics Department, University of Pennsylvania - Fall 2014, Fall 2015, Spring 2016

## *Teacher Training and Mentorship*

CTL Fellowship, University of Pennsylvania, 2016-2017 Academic Year

*Organized departmental teaching workshops, led university-wide teaching workshops, provided teaching observations and feedback to graduate TAs from the departments of computer science, economics, electrical engineering and neuroscience.*

Mathematics Department Master TA, UPenn, 2015-2016, 2016-2017 and 2017-2018 Academic Years

*Responsible for training for new TAs in the mathematics department, observing and mentoring them during their first semester teaching.*

UPenn CTL Summer Math Mentor, Summer 2017 and 2018

*Responsible for mentoring mathematics graduate students serving as instructors for the first time and organizing teaching workshops.*

## *Mentoring Experience*

Smith College Putnam team mentor, Fall 2018

Graduate Mentor, Emerging Scholars Program, 2016-2017 and 2017-2018 Academic Years

*Mentor for an NSF-funded program to prepare students with a limited mathematics background to major in math and computer science.*

## *Other Teaching Activities*

Project NExT Fellow, Mathematical Association of America, 2021-2022 Academic Year

No-cost materials development project, Calculus III - University of Georgia, Spring 2020

*Awarded a grant by the University of Georgia Center for Teaching and Learning to adapt online materials for use in Calculus III, to provide students and instructors a no-cost option for course materials.*

## University-Wide Service

Counseling and Psychological Services Student Advisory Board, University of Pennsylvania, 2016-2017 and 2017-2018 Academic Years

## References

Professor Christopher Croke

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