

BIOGRAPHICAL SKETCH

THOMAS JAMES BIESKE

PROFESSIONAL PREPARATION:

Purdue University, Honors Mathematics, Bachelor of Science, 1991.
Purdue University, Mathematics, Master of Science, 1993.
University of Pittsburgh, Mathematics, Ph.D., 1999.
University of Arkansas, Visiting Assistant Professor,
Dept. of Mathematics, 1999-2000.
University of Michigan, NSF VIGRE Postdoctoral Fellow, 2000-2003.

APPOINTMENTS:

Professor, University of South Florida, 2019-present.
Associate Professor, University of South Florida, 2009-2019.
Assistant Professor, University of South Florida, 2003-2009.
NSF VIGRE Postdoctoral Fellow, University of Michigan, 2000-2003.
Visiting Assistant Professor, University of Arkansas, 1999-2000.
Graduate Teaching Fellow, University of Pittsburgh, 1995-1999.
Graduate Teaching Assistant, University of Pittsburgh, 1993-1995.
Graduate Teaching Assistant, Purdue University, 1991-1993.

GRANTS:

Florida Consortium of Metropolitan Research Universities Faculty Learning
Community Calculus Mini-Grant
Helmsley Foundation
Funding period: June 10, 2016-August 15, 2016.
Award amount: \$2500.

STEER STEM Ed Travel Grant

University of South Florida via NSF DUE-1347753 and DUE-1525574
Funding period: February 8, 2016-September 30, 2016.
Award amount: \$1000 plus \$250 Department of Mathematics and Statistics match.

Proposal Enhancement Grant

University of South Florida
Funding period: November 1, 2011-October 31, 2012.
Award amount: \$21,500.

7th International Conference on Differential Equations and Dynamical Systems

National Science Foundation Grant DMS-1010998, Co-PI
Funding Period: July 1, 2010-June 30, 2011.

25th Southeastern Analysis Meeting
National Science Foundation Grant DMS-0849032, Co-PI
Funding Period: March 1, 2009-February 28, 2010.

College of Arts and Sciences Faculty Development Grant
University of South Florida
Funding Period: January 1, 2007-August 31, 2007.

University of South Florida International Travel Grant
Funding Period: Summer 2006.

College of Arts and Sciences Matching International Travel Grant
University of South Florida
Grant awarded, but unfunded; conflict with International Travel Grant.

University of South Florida New Researcher Grant
Title: The Isoperimetric Problem in Grushin-type Spaces
Funding Period: May 1, 2005-April 30, 2006.

College of Arts and Sciences Faculty Development Grant
University of South Florida
Funding Period: May 1, 2004-December 31, 2004.

TEACHING EXPERIENCE:

Assistant Professor/Associate Professor/Professor, August 2003-present
University of South Florida, Tampa, Florida

Undergraduate: Business Calculus, Engineering Calculus I, II and III,
Intermediate Analysis, Vector Calculus, Differential Equations,
Partial Differential Equations, Bridge to Abstract Mathematics,
Complex Variables, Linear Algebra, Differential Geometry, Modern Geometry.

Graduate: Geometric Measure Theory (Topics course),
Methods of Applied Math, Partial Differential Equations I and II,
Advanced Linear Algebra, Dynamical Systems I, Differential Geometry,
Control Theory, Topology I and II (wrote Ph.D. qualifying exams).

Chose textbooks, structured course, planned syllabi.

NSF VIGRE Postdoctoral Fellow, August 2000-May 2003

University of Michigan, Ann Arbor, Michigan

Calculus II, Fourier Analysis and Applications,
Advanced Calculus, Advanced Math for Engineers.

Chose textbooks and content, created syllabi and exams.

Visiting Assistant Professor, August 1999-July 2000
University of Arkansas, Fayetteville, Arkansas
Calculus III, Differential Equations, Vector Spaces.
Structured course, wrote syllabi and exams.

Teaching Fellow/Assistant, August 1993-May 1999
University of Pittsburgh, Pittsburgh, Pennsylvania
Calculus Computer Lab Coordinator
Oversaw the use of *Mathematica* for all Calculus courses.
Coordinated Teaching Asst. and Undergraduate Asst. lab office hours.

Lecturer and Recitation Leader
Conducted recitations for Calculus I and II.
Lectured Business Calculus and Calculus I.
Coordinated syllabi and *Mathematica* assignments.
Created exams, graded and supervised Teaching Assistants.

Teaching Assistant, August 1991-May 1993
Purdue University, West Lafayette, Indiana
Led recitations for Calculus I.
Lectured Calc. for Liberal Arts Majors and Calc. for Technology Majors.
Coordinated syllabi and created exams.

PUBLICATIONS:

1. *Existence and Uniqueness of Viscosity Solutions to the Infinity Laplacian Relative to a Class of Grushin-Type Vector Fields*
Joint with Zachary Forrest.
Submitted for publication.
2. *Generalizations of the Drift Laplace Equation over the Quaternions in a Class of Grushin-Type Spaces*
Joint with Keller Blackwell.
Submitted for publication.
3. *A Radó-type Theorem for the p -Laplace Equation in the Heisenberg Group*
Joint with Zachary Forrest and Robert Freeman.
Submitted for publication.
4. *Generalizations of the Drift Laplace Equation in the Heisenberg Group and a Class of Grushin-Type Spaces*
Joint with Keller Blackwell.
Electron. J. Diff. Eqns. **2021**, 2021 (99), 1–13.
5. *On the Lie Algebra of polarizable Carnot groups*
Anal. and Math. Physics. **2020**, 10, No. 80, 11pp.
6. *Correction to “A $p(x)$ -Poincaré-type inequality for variable exponent Sobolev spaces with zero boundary values in Carnot groups”*
Joint paper with Robert Freeman.
Anal. and Math Phys. **2019**, 9 (4), 1611–1612.

7. *On the p -Laplace equation in a class of Hörmander Vector Fields*
 Joint paper with Robert Freeman.
 Electron. J. Diff. Eqns. **2019**, 2019 (35), 1–13.
8. *Equivalence of Weak and Viscosity Solutions to the $p(x)$ -Laplacian in Carnot Groups*
 Joint paper with Robert Freeman.
 Anal. and Math Phys. **2019**, 9 (4), 1583–1610.
9. *A $p(\cdot)$ -Poincaré-type Inequality for Variable Exponent Sobolev Spaces with Zero Boundary Values in Carnot Groups*
 Joint paper with Robert Freeman.
 Anal. and Math Phys. **2018**, 8 (2), 289–308.
10. *The $\infty(x)$ -equation in Grushin-type Spaces*
 Electron. J. Diff. Eqns. **2016**, 2016 (125), 1–13.
11. *The parabolic infinite-Laplace equation in Carnot groups*
 Joint paper with Erin Martin.
 Mich. Math. J. **2016**, 65 (3), 489–509.
12. *The $\infty(x)$ -equation in Riemannian Vector Fields*
 Electron. J. Diff. Eqns. **2015**, 2015 (164), 1–9.
13. *The parabolic p -Laplace equation in Carnot groups*
 Joint paper with Erin Martin.
 Ann. Acad. Sci. Fenn. Math. **2014**, 39, 605–623.
14. *Generalizations of a Laplacian-Type Equation in the Heisenberg Group and a Class of Grushin-Type Spaces*
 Joint paper with Kristen Childers.
 Proc. Amer. Math. Soc. **2014**, 142, 989–1003.
15. *Fundamental solutions to p -Laplace equations in Grushin vector fields*
 Electron. J. Diff. Eqns. **2011**, 2011 (84), 1–10.
16. *A Sub-Riemannian Maximum Principle and its application to the p -Laplacian in Carnot Groups*
 Ann. Acad. Sci. Fenn. Math. **2012**, 37, 119–134.
17. *The Infinite Dirac Operator*
 Joint paper with John Ryan.
 2010 J. Phys.: Conf. Ser. 254 012003.
18. *The Carnot-Carathéodory distance vis-à-vis the eikonal equation and the infinite Laplacian*
 Bull. London Math. Soc. **2010** 42 (3), 395–404.
19. *The Carnot-Carathéodory distance and the infinite Laplacian*
 Joint paper with Federica Dragoni and Juan Manfredi.
 J. of Geo. Anal. **2009**, 19 (4), 737–754.
20. *Properties of Infinite Harmonic Functions on Grushin-type spaces*
 Rocky Mtn J. of Math. **2009**, 39 (3), 729–756.
21. *Parabolic equations relative to Vector Fields*
 Electron. J. Diff. Eqns. **2008**, 2008 (124), 1–7.
22. *Properties of Infinite Harmonic Functions relative to Riemannian Vector Fields*
 Le Matematiche **2008**, LXIII (2), 19–37.

23. *A Comparison principle for a class of subparabolic equations in Grushin-type spaces.*
Electron. J. Diff. Eqns. **2007**, 2007 (30), 1–9.
24. *Equivalence of weak and viscosity solutions to the p -Laplacian in the Heisenberg Group*
Ann. Acad. Sci. Fenn. Math. **2006**, 31, 363–379.
25. *The p -Laplace Equation on a class of Grushin-type Spaces*
Joint paper with Jasun Gong.
Proc. Amer. Math. Soc. **2006**, 134 (12), 3585–3594.
26. *Comparison principle for parabolic equations in the Heisenberg group*
Electron. J. Diff. Eqns. **2005**, 2005 (95), 1–11.
27. *The Maximum Principle for Vector Fields*
Joint paper with Frank Beatrous and Juan Manfredi.
Contemp. Math. 370, Amer. Math. Soc., Providence, RI, 2005, 1–9.
28. *Absolute Minimizers on Carnot Groups*
Future Trends in Geometric Function Theory. RNC Workshop.
Jyväskylä 2003. University of Jyväskylä
Dept. of Mathematics and Statistics, Report 92, 15–21.
29. *The Aronsson-Euler Equation for Absolutely Minimizing Lipschitz Extensions with Respect to Carnot-Carathéodory Metrics*
Joint paper with Luca Capogna.
Trans. Amer. Math. Soc. **2005**, 357 (2), 795–823.
30. *Lipschitz Extensions on generalized Grushin Spaces*
Michigan Math J. **2005**, 53 (1), 3–31.
31. *Viscosity solutions on Grushin-type planes*
Ill. J. Math. **2002**, 46, 893–911.
32. *On Infinite Harmonic Functions on the Heisenberg Group*
Comm. in PDE **2002**, 27, (3 & 4), 727–762.

HONORS AND AWARDS:

Inclusive Excellence Award Nominee

University of South Florida Office of Diversity, Equity, and Inclusion, 2022
Teplitz-Culver Award for Outstanding Graduate Student
in Mathematics (cash award),
University of Pittsburgh, 1997.

President, Mathematics Graduate Student Organization,
University of Pittsburgh, 1995-1998.

Member, Phi Beta Kappa, 1991-present.

Faculty Advisor, USF Chapter 2020-present.

Member, Phi Kappa Phi, 1991-present.

Executive Council, USF Chapter 2006-present.

Member, Golden Key Honor Society, 1991-present.

GRADUATE STUDENTS:

1. Meagan McNamee, Master's Thesis Advisor. Graduated 2005.
2. Ena Salter, Master's Thesis Committee Member. Graduated 2005.
3. Andrew Purcell, Master's Thesis Advisor. Graduated 2006.
4. Sarah Bleiler, Master's Thesis Committee Member. Graduated 2008.
5. Elliot Findley, Ph.D. Committee Member. Graduated 2009.
6. Konstantinos Dalamagkidis, (Comp. Sci. and Eng.), Ph.D. Committee Member. Graduated 2010.
7. Kristen Childers, Master's Thesis Advisor. Graduated 2011.
8. Butch Knudsen (Chemistry), Ph.D. Committee Member. Graduated 2013.
9. James Klinedinst, Master's Thesis Advisor. Graduated 2014.
10. Dewey Estep (University of Cincinnati), Ph.D. Committee Member. Graduated 2015.
11. Yue Sun, Master's Thesis Committee Member. Graduated 2016.
12. Robert Freeman, Ph.D. Thesis Advisor. Graduated 2020.
13. Zachary Forrest, Ph.D. Thesis Advisor. Graduation expected 2024.

UNDERGRADUATE STUDENTS:

1. Johnathan Gray, Undergraduate Honors Thesis Advisor. Graduated 2015.
2. Keller Blackwell, Undergraduate Thesis Advisor/Goldwater Fellowship Application Advisor. Graduated 2020. Currently a Knight-Hennessy Scholar at Stanford University (Computer Science).
3. Alejandro Cano, Undergraduate Mentor. Graduated 2022. Currently at Purdue University (Mathematics).
4. Alexander Brower, Undergraduate Mentor. Graduated 2022. Currently at University of Georgia (Mathematics).

INVITED ADDRESSES:

1. *University of Pittsburgh Department of Mathematics Colloquium*
University of Pittsburgh, Pittsburgh, PA, Sept. 24, 2021.
2. *The Eighth Ohio River Analysis Meeting*
University of Kentucky, Lexington, KY, Mar. 24-25, 2018.
3. *University of Cincinnati Analysis Seminar*
University of Cincinnati, Cincinnati, OH, Mar. 16, 2016.
4. *The Sixth Ohio River Analysis Meeting*
University of Kentucky, Lexington, KY, Mar. 12-13, 2016.
5. *The Fifth Ohio River Analysis Meeting*
University of Cincinnati, Cincinnati, OH, Feb. 28-Mar. 1, 2015.
6. *University of Cincinnati Graduate Student Seminar*
Cincinnati, OH, Mar. 11, 2014.
7. *University of Cincinnati Mathematics Dept. Colloquium*
Cincinnati, OH, Mar. 11, 2014.
8. *The Fourth Ohio River Analysis Meeting*
University of Kentucky, Lexington, KY, Mar. 8-9, 2014.

9. *The Third Ohio River Analysis Meeting*
University of Cincinnati, Cincinnati, OH, Mar. 9-10, 2013.
10. *AMS Sectional Meeting*
Special Session on Analysis in Metric Spaces
University of South Florida, Tampa, FL, Mar. 10-11, 2012.
11. *AMS Sectional Meeting*
Special Session on Geometric Aspects of Analysis and Measure Theory
Cornell University, Ithaca, NY, Sept. 10-11, 2011.
12. *Recent Developments on L -infinity Variational Problems and Associated Nonlinear Partial Differential Equations*
University of Kentucky, Lexington, KY, May 12-14, 2011.
13. *AMS-MAA Joint Mathematics Meeting*
AMS Special Session on Dirac Operators
New Orleans, LA, Jan. 6-9, 2011.
14. *AMS Sectional Meeting*
Special Session on Geometric Function Theory and Analysis on Metric Spaces
University of Kentucky, Lexington, KY, Mar. 27-28, 2010.
15. *University of Cincinnati Mathematics Dept. Colloquium*
Cincinnati, OH, Dec. 5, 2009.
16. *University of Pittsburgh Mathematics Dept. Colloquium*
Pittsburgh, PA, July 25, 2008.
17. *University of Cincinnati Mathematics Dept. Colloquium*
Cincinnati, OH, Oct. 25, 2007.
18. *AMS Sectional Meeting*
Special Session on Subelliptic PDEs and Sub-Riemannian Geometry
University of Arkansas, Fayetteville, AR, Nov. 3-4, 2006.
19. The Banach Center Conference on Analysis and Partial Differential Equations
in honor of Professor Bogdan Bojarski
Bedlewo, Poland, June 19-23, 2006.
20. *AMS Sectional Meeting*
Special Session on Singular Integrals, Geometric Analysis,
and Free Boundary Problems
Florida International University, Miami, FL, Apr. 1-2, 2006.
21. *University of Cincinnati Mathematics Dept. Colloquium*
Cincinnati, OH, Oct. 6, 2005.
22. *AMS Sectional Meeting*
Special Session on Geometric Analysis and Partial Differential Equations
in Subelliptic Structures
University of Pittsburgh, Pittsburgh, PA, Nov. 6-7, 2004.
23. *University of South Florida Undergraduate Math Club*
Tampa, FL, Oct. 29, 2004.
24. *AMS Sectional Meeting*
Special Section on Analysis and Geometry in
Carnot-Carathéodory Spaces
University of New Mexico, Albuquerque, NM, Oct. 16-17, 2004.

25. *AMS Sectional Meeting*
Special Section on Regularity of PDE's and Harmonic Analysis
University of New Mexico, Albuquerque, NM, Oct. 16-17, 2004.
26. *University of Cincinnati Mathematics Dept. Colloquium*
Cincinnati, OH, Feb. 19, 2004.
27. *Third Prairie Analysis Seminar*
Kansas State University, Manhattan, KS, Oct. 17-18, 2003.
28. *RNC Workshop on Future Trends in Geometric Function Theory*
University of Jyväskylä, Finland, June 15-18, 2003.
29. *Symposium on Analysis and PDE's*
Purdue University, West Lafayette, IN, May 23-26, 2003.
30. *University of Kentucky Analysis Seminar*
Lexington, KY, Apr. 4, 2003.
31. *Workshop in Analysis and Geometry in Carnot-Carathéodory spaces*
University of Arkansas, Fayetteville, Mar. 7-8, 2003.
32. *University of Pittsburgh Analysis Seminar*
Pittsburgh, PA, Oct. 17, 2002.
33. *AMS Sectional Meeting*
Special Session on Topics in Geometric Function Theory
University of Michigan, Ann Arbor, MI, Mar. 1-3, 2002.
34. *University of Arkansas Dept. of Mathematics Colloquium*
Fayetteville, AR, Feb. 7, 2002.
35. *SUNY-Stony Brook Complex Analysis and Geometry Seminar*
Stony Brook, NY, Apr. 4, 2001.
36. *Wayne State University PDE Seminar*
Detroit, MI, Mar. 6, 2001.
37. *AMS Sectional Meeting*
Special Session on Carnot-Carathéodory Spaces
University of Notre Dame
Notre Dame, Indiana, Apr. 7-9, 2000.

SYNERGISTIC ACTIVITIES:

- Departmental Liaison with Office of National Scholarships. Work with ONS Director Dr. Sayandeb Basu to identify and target mathematics majors for external awards such as the Barry Goldwater, Marshall, and Knight-Hennessy Scholarships.
- Recommendation writer for and informal adviser to Alexander Mercier, USF's first ever Rhodes Scholarship finalist.
- Current member of Phi Beta Kappa Honor Society and Phi Kappa Phi Honor Society faculty councils.
- Author of textbook *An Introduction to Writing Mathematical Proofs: Shifting Gears from Calculus to Upper-Level Mathematics Classes*, Fifth Edition. Kindle Direct Publishing.
Hardcover: ISBN-13: 979-8724955300, March 19, 2021.
Paperback: ISBN-13: 979-8561230653, November 8, 2020.
- Created and developed graduate Differential Geometry II course and Differential Geometry graduate sequence.

- Undergraduate Committee Chair, August 2011-August 2015.
 - Created Major Tracks (Pure/Applied/General) to help mathematics majors achieve their post-graduation goals.
 - Created and developed undergraduate Differential Geometry course.
 - Shepherded the creation and addition of Elementary Abstract Algebra II, Introduction to Graph Theory, Introduction to Combinatorics and Introduction to Cryptography and Coding Theory.
 - Formed Linear Algebra ad hoc committee of experts and frequent instructors to enhance and improve the course.
- Florida Consortium of Metropolitan Research Universities Faculty Learning Community, Mathematics Committee Member, August 2015-August 2017.
- Engineering Calculus Peer Leading Coordinator, Fall 2011, Fall 2015 and Spring 2016.
- USF STEM for Scholars Summer Program, Linear Algebra Instructor, Summer 2011-2013.
- Mentor for high school student Sean Chapman, Spring Hill High School, Summer 2012. Graduated Tufts University.
- Co-organizer with Catherine Bénéteau, Dima Khavinson, and Sherwin Kouchekian, 25th Southeastern Analysis Meeting, Tampa, FL, March 20-22, 2009.
- Co-organizer with Wen-Xiu Ma, Yuncheng You, and Sherwin Kouchekian, 7th International Conference on Differential Equations and Dynamical Systems, Tampa, FL, Dec. 15-18, 2010.
- President of USF Chapter, Phi Kappa Phi Honor Society, August 2011-May 2014.
- USF Dept. of Mathematics and Statistics Graduate School Recruitment Presentations at the University of Pittsburgh and University of Cincinnati. Fall 2006 and 2009.
- USF Academy for Teaching and Learning Excellence/STEER Peer Observation Program participant. Fall 2018.
- Administrator and Creator of Facebook page “Avenue Carnot”. Non-Facebook access via <http://shell.cas.usf.edu/~tbieske/index.html> .

PROFESSIONAL ASSOCIATIONS:

American Mathematical Society