

Mohammad Ghomi

Curriculum Vita

Feb 25, 2024

School of Mathematics
Georgia Institute of Technology
Atlanta, GA 30332

ghomi@math.gatech.edu
www.math.gatech.edu/~ghomi
404-894-6579

Education

| | |
|---|------|
| Johns Hopkins University, B.A. Mathematics, | 1992 |
| Johns Hopkins University, Ph.D. Mathematics (Advisor: Joel Spruck), | 1998 |

Professional Experience

| | |
|--|--------------|
| Visiting Assistant Professor, University of California at Santa Cruz, | 1998–2000 |
| Assistant Professor, University of South Carolina, | 2000–2003 |
| Visiting Associate Professor, Pennsylvania State University, | 2003–2005 |
| Associate Professor, Georgia Institute of Technology, | 2003–2009 |
| Professor, Georgia Institute of Technology, | 2009–2015 |
| Professor and Director of Graduate Studies, Georgia Institute of Technology, | 2015–2019 |
| Professor, Georgia Institute of Technology, | 2019–Present |

Research Interests

Geometry and topology of Riemannian submanifolds, including curves and surfaces in Euclidean space and convexity problems

Awards and Grants

| | |
|--|-----------|
| J.J. Sylvester Prize in Mathematics, Johns Hopkins University, | 1992 |
| NSF Research Grant, PI (DMS-0204190, \$97,000), | 2002–2005 |
| NSF CAREER Award, PI (DMS-0332333, \$400,000), | 2003–2009 |
| NSF Research Grant, PI (DMS-0806305, \$114,105), | 2008–2012 |
| NSF Research Grant, PI (DMS-1308777, \$176,000), | 2013–2017 |
| NSF Research Grant, PI (DMS-1711400, \$245,427), | 2017–2021 |
| Simons Fellowship (\$132,000), | 2020 |
| NSF Research Grant, PI (DMS-2202337, \$315,000), | 2022–2025 |

Papers¹

- (1) Strictly convex submanifolds and hypersurfaces of positive curvature, *J. Differential Geom.*, **57** (2001) 239–271.
- (2) Gauss map, topology, and convexity of hypersurfaces with nonvanishing curvature, *Topology*, **41** (2002) 107–117.
- (3) Shadows and convexity of surfaces, *Ann. of Math.*, **155** (2002) 281–293.
- (4) The problem of optimal smoothing for convex functions, *Proc. Amer. Math. Soc.*, **130** (2002) 2255–2259.
- (5) Solution to the shadow problem in 3-space, in Minimal Surfaces, Geometric Analysis and Symplectic Geometry, *Adv. Stud. Pure Math.*, **34** (2002) 129–142.
- (6) Skew loops and quadric surfaces (with B. Solomon), *Comment. Math. Helv.*, **77** (2002) 767–782.

¹Preprints of all papers are available at www.math.gatech.edu/~ghomi/Papers

- (7) Circles minimize most knot energies (with A. Abrams, J. Cantarella, J. Fu and R. Howard), *Topology*, **42** (2003) 381–394.
- (8) The convex hull property and topology of hypersurfaces with nonnegative curvature (with S. Alexander), *Adv. Math.*, **180** (2003), 324–354.
- (9) A smooth convex loop with vanishing projections, *Topology*, **43** (2004), 245.
- (10) Optimal smoothing for convex polytopes, *Bull. London. Math. Soc.*, **36** (2004), 483–492.
- (11) Shortest periodic billiard trajectories in convex bodies, *Geom. Funct. Anal.*, **14** (2004), 295–302.
- (12) The convex hull property of noncompact surfaces (with S. Alexander), *Amer. J. Math.*, **126** (2004), 891–897.
- (13) Nonexistence of skew loops on ellipsoids, *Proc. Amer. Math. Soc.*, **133** (2005), 3687–3690.
- (14) Tangent bundle embeddings of manifolds in Euclidean space, *Comment. Math. Helv.*, **1** (2006), 259–270.
- (15) Total positive curvature of hypersurfaces with convex boundary, (with J. choe and M. Ritore), *J. Differential Geom.*, **72** (2006), 129–147.
- (16) h -Principles for hypersurfaces with prescribed principal curvatures and directions (with M. Kossowski), *Tran. Amer. Math. Soc.*, **358** (2006), 4379–4393.
- (17) Relative isoperimetric inequality outside convex domains in R^n , (with J. choe and M. Ritore), *Calc. Var. Partial Differential Equations*, **29** (2007), 421–429.
- (18) h -principles for curves and knots of constant curvature, *Geom. Dedicata*, **127** (2007), 19–35.
- (19) Topology of surfaces with connected shades, *Asian J. Math.* **11** (2007), 621–634.
- (20) Totally skew embeddings of manifolds (with S. Tabachnikov), *Math. Z.*, **258** (2008), 499–512.
- (21) Topology of negatively curved real affine algebraic surfaces (with C. Connell), *J. Reine Angew. Math.*, **624** (2008), 1–26.
- (22) Topology of Riemannian submanifolds with prescribed boundary (with S. Alexander, and J. Wong), *Duke Math. J.*, **152** (2010), 533–565.
- (23) Relative isometric embeddings of Riemannian manifolds (with R. Greene), *Tran. Amer. Math. Soc.*, **363** (2011), 63–73.
- (24) A Riemannian four vertex theorem for surfaces with boundary, *Proc. Amer. Math. Soc.*, **139** (2011), 293–303.
- (25) Directed immersions of closed manifolds, *Geom. Topol.*, **15** (2011) 699–705.
- (26) Normal curvatures of asymptotically constant graphs and Carathéodory’s conjecture (with R. Howard), *Proc. Amer. Math. Soc.*, **140** (2012), 4323–4335.
- (27) Deformations of unbounded convex bodies and hypersurfaces, *Amer. J. Math.*, **134** (2012), 1585–1611.
- (28) Vertices of closed curves in Riemannian surfaces, *Comment. Math. Helv.*, **88** (2013), 427–448.
- (29) Tangent lines, inflections, and vertices of closed curves, *Duke Math. J.*, **162** (2013), 2691–2730.
- (30) Tangent cones and regularity of real hypersurfaces (with R. Howard), *J. Reine Angew. Math.*, **697** (2014), 221–247.
- (31) Affine unfoldings of convex polyhedra, *Geom. Topol.*, **18** (2014), 3055–3090.
- (32) Total diameter and area of closed submanifolds (with R. Howard), *Math. Ann.*, **363** (2015), 985–999.
- (33) Boundary torsion and convex caps of locally convex surfaces, *J. Differential Geom.*, **105** (2017), 427–486.
- (34) Dürer’s unfolding problem for convex polyhedra, *Notices of AMS*, **65** (2018), 25–27.
- (35) The length, width, and inradius of space curves, *Geom. Dedicata*, **196** (2018), 123–143.
- (36) Torsion of locally convex curves, *Proc. Amer. Math. Soc.*, **147** (2019), 1699–1707.

- (37) Nonnegatively curved surfaces with free boundary on the sphere (with C. Xiong), *Calc. Var. Partial Differential Equations*, **58** (2019), Art. 94, 20 pp.
- (38) Rigidity of nonnegatively curved surfaces relative to a curve (with J. Spruck), *Int. Math. Res. Not. IMRN*, **17** (2020), 5387–5400.
- (39) Pseudo-edge unfoldings of convex polyhedra (with N. Barvinok), *Discrete Comput. Geom*, **64** (2020), 671–689.
- (40) Centers of disks in Riemannian manifolds (with I. Belegradek), *Pacific J. Math*, **304** (2020), 401–418.
- (41) Shortest closed curve to inspect a sphere (with J. Wenk), *J. Reine Angew. Math*, **738** (2021), 57–84.
- (42) Total curvature and the isoperimetric inequality in Cartan-Hadamard manifolds (with J. Spruck), *J. Geom. Anal.*, **738** (2022), Article number: 50.
- (43) Total mean curvatures of Riemannian hypersurfaces (with J. Spruck), *Adv. Nonlinear Stud.*, 23 (2023) pp. 20220029.
- (44) Rigidity of nonpositively curved manifolds with convex boundary (with J. Spruck), *Proc. Amer. Math. Soc.*, **151** (2023), 4935–4940.
- (45) Minkowski inequality in Cartan-Hadamard manifolds (with J. Spruck), *Int. Math. Res. Not. IMRN*, **20** (2023), 17892–17910.
- (46) Comparison formulas for total mean curvatures of Riemannian hypersurfaces, to appear in *Adv. Nonlinear Stud.*
- (47) Shortest closed curve to contain a sphere in its convex hull (with J. Wenk), *submitted*.
- (48) Point selections from Jordan domains in Riemannian surfaces (with I. Belegradek), *submitted*.
- (49) Convexity and rigidity of hypersurfaces in Cartan-Hadamard manifolds, *submitted*.
- (50) Open problems in geometry of curves and surfaces, *in progress*.

Research Collaborators

- (1) Aaron Abrams (Emory University)
- (2) Stephanie Alexander (University of Illinois at Urbana-Champaign)
- (3) Nicholas Barvinok (University of Michigan)
- (4) Igor Belegradek (Georgia Tech)
- (5) Jason Cantarella (University of Georgia)
- (6) Jaigyoung Choe (Seoul National University, Korea)
- (7) Chris Connell (Indiana University)
- (8) Joseph Fu (University of Georgia)
- (9) Robert Greene (UCLA)
- (10) Ralph Howard (University of South Carolina)
- (11) Marek Kossowski (University of South Carolina)
- (12) Manuel Ritore (University of Granada, Spain)
- (13) Bruce Solomon (Indiana University)
- (14) Joel Spruck (Johns Hopkins University)
- (15) Serge Tabachnikov (Pennsylvania State University)
- (16) James Wenk (Georgia Tech)
- (17) Jeremy Wong (University of Toronto)
- (18) Changwei Xiong (Australian National University)

Talks

- | | |
|--|-----------|
| (1) <i>Global Analysis Seminar</i> , Johns Hopkins U., | Sep. 1997 |
| (2) <i>Colloquium</i> , U. of South Carolina, | Jan. 1998 |
| (3) <i>G.A.N.G. Seminar</i> , U. Mass. at Amherst, | Feb. 1998 |

| | |
|--|-----------|
| (4) <i>Differential Geometry Seminar</i> , Harvard University, | Feb. 1998 |
| (5) <i>Geometry Seminar</i> , M.S.R.I., | Sep. 1998 |
| (6) <i>Colloquium</i> , U.C. Santa Cruz, | Jan. 1999 |
| (7) <i>Differential Geometry Seminar</i> , U. of Illinois at Urbana, | Mar. 1999 |
| (8) <i>J.A.M.I. Conference on Minimal Surfaces</i> , Johns Hopkins U., | Mar. 1999 |
| (9) <i>Geometry and Topology Seminar</i> , U. of Pennsylvania, | Mar. 1999 |
| (10) <i>Geometric Analysis Seminar</i> , Stanford University, | Apr. 1999 |
| (11) <i>Geometry Seminar</i> , U.C. Berkeley, | Feb. 2000 |
| (12) <i>Geometry Seminar</i> , Indiana University, | Apr. 2000 |
| (13) <i>Geometry Seminar</i> , University of Georgia, | Oct. 2000 |
| (14) <i>Session on Curves & Surfaces</i> , A.M.S. Southeastern, Columbia, SC | Mar. 2001 |
| (15) <i>C.M.I. Conf. on Minimal Surfaces</i> , M.S.R.I., | Jul. 2001 |
| (16) <i>Colloquium</i> , Georgia Tech, | Aug. 2001 |
| (17) <i>Colloquium</i> , College of Charleston, | Nov. 2001 |
| (18) <i>Session on Applied Math.</i> , A.M.S. Southeastern, Atlanta, | Mar. 2002 |
| (19) <i>Colloquium</i> , College of Charleston, | Apr. 2002 |
| (20) <i>Comp. Vision Seminar</i> , ECE Dept. N.C. State University, , | May. 2002 |
| (21) <i>Conference on Convexity</i> , P.I.M.S. at U. British Columbia, | Jul. 2002 |
| (22) <i>Session on Convex Geometry</i> , A.M.S. Eastern, Boston, | Oct. 2002 |
| (23) <i>Session on Optimal Geometry</i> , A.M.S. Central, Wisconsin, | Oct. 2002 |
| (24) <i>Analysis Seminar</i> , Johns Hopkins U., | Nov. 2002 |
| (25) <i>Analysis Seminar</i> , U. of Pennsylvania, | Nov. 2002 |
| (26) <i>Colloquium</i> , Georgia Tech, | Jan. 2003 |
| (27) <i>Colloquium</i> , Indiana University, | Feb. 2003 |
| (28) <i>Analysis/PDE Seminar</i> , MIT, | Mar. 2003 |
| (29) <i>Southeast Geometry Conference</i> , College of Charleston, | Mar. 2003 |
| (30) <i>Session on Differential Geometry</i> , AMS Central, Bloomington, | Apr. 2003 |
| (31) <i>Colloquium</i> , University of Toledo, | Apr. 2003 |
| (32) <i>Southeast Geometry Seminar III</i> , U. of Alabama, Birmingham, | May 2003 |
| (33) <i>Georgia Topology Conference</i> , U. of Georgia, | Jun. 2003 |
| (34) <i>Conf. on Monge-Ampere Equations</i> , Banff Research Center, | Aug. 2003 |
| (35) <i>Dynamical Systems and Geometry Seminar</i> , Penn State, | Sep. 2003 |
| (36) <i>MASS Colloquium</i> , Penn State, | Oct. 2003 |
| (37) <i>Geometry and Topology Seminar</i> , Georgia Tech, | Nov. 2003 |
| (38) <i>Topology Seminar</i> , Penn State, | Nov. 2003 |
| (39) <i>Conference in honor of E. Feldman</i> , CUNY, | Feb. 2004 |
| (40) <i>Geometry-Topology Seminar</i> , University of Pennsylvania, | Mar. 2004 |
| (41) <i>The XIII School of Diff. Geometry, Plenary Talk</i> , U. of São Paulo, | Jul. 2004 |
| (42) <i>Geometry Seminar</i> , IMPA, Rio de Janeiro, | Jun. 2004 |
| (43) <i>MASSfest Conf. for REU students</i> , Penn State, | Aug. 2004 |
| (44) <i>Geometry Seminar</i> , Penn State, | Sep. 2004 |
| (45) <i>Geometry Seminar</i> , Georgia Tech, | Dec. 2004 |
| (46) <i>Geometry and Analysis Seminar</i> , Columbia University, | Mar. 2005 |
| (47) <i>Colloquium</i> , University of Alabama at Birmingham, | Oct. 2005 |
| (48) <i>Topology and Geometry Seminar</i> , University of Georgia, | Nov. 2005 |
| (49) <i>Session on Convex Geometry</i> , AMS National, San Antonio, | Jan. 2006 |
| (50) <i>Bloomington Geometry Workshop</i> , Indiana University, | Apr. 2006 |
| (51) <i>Session on Discrete and Convex Geom.</i> , Canadian Math. Soc., Calgary, | Jun. 2006 |

| | |
|---|------------|
| (52) <i>Geometry Seminar</i> , University of Georgia, | Sep. 2006 |
| (53) <i>Differential Geometry/Analysis Seminar</i> , Emory University, | Oct. 2006 |
| (54) <i>Conf. on Geometric Analysis and Elliptic PDE's</i> , Johns Hopkins U., | Oct. 2006 |
| (55) <i>Conference on Geometric Analysis</i> , KIAS, Seoul, | Sept. 2007 |
| (56) <i>Geometry Seminar</i> , Duke University, | Oct. 2007 |
| (57) <i>Felix Klein Seminar</i> , University of Notre Dame, | Feb. 2008 |
| (58) <i>Geometry Seminar</i> , University of Georgia, | Mar. 2008 |
| (59) <i>Southeast Geometry Conference</i> , University of South Carolina, | Mar. 2008 |
| (60) <i>Geometry Seminar</i> , George Washington University, | Mar. 2008 |
| (61) <i>Analysis Seminar</i> , Johns Hopkins University, | May 2008 |
| (62) <i>Geometry-Topology Seminar</i> , University of Pennsylvania, | May 2008 |
| (63) <i>XV Brazilian School of Differential Geometry</i> , Fortaleza, Plenary Talk, | July 2008 |
| (64) <i>MASS Colloquium</i> , Penn State U., | Sep. 2008 |
| (65) <i>Session on Convex Geometry</i> , AMS Western, Vancouver, | Oct. 2008 |
| (66) <i>Colloquium</i> , Georgia Tech, | Oct. 2008 |
| (67) <i>Conference in honor of Herman Gluck</i> , Rutgers U., Newark, | Nov. 2008 |
| (68) <i>Colloquium and Fejes Toth Lecture</i> University of Calgary, | Mar. 2009 |
| (69) <i>Discrete Geometry Seminar</i> University of Calgary, | Mar. 2009 |
| (70) <i>Session on Differential Geometry</i> , AMS Central, Urbana, | Mar. 2009 |
| (71) <i>Colloquium</i> , College of Charleston, | Apr 2009 |
| (72) <i>Differential Geometry Seminar</i> , Indiana University, | Apr 2009 |
| (73) <i>Differential Geometry Seminar</i> , University of Minnesota, | May 2009 |
| (74) <i>International Symposium on Differential Geometry</i> , Rio de Janeiro, | Aug. 2009 |
| (75) <i>Differential Geometry/Analysis Seminar</i> , Emory University, | Feb. 2010 |
| (76) <i>Conference on Volume Inequalities</i> , Banff, | Mar. 2010 |
| (77) <i>Conference on Surface Theory</i> , Buzios, Brazil, | Apr. 2010 |
| (78) <i>Southeast Geometry Conference</i> , Charleston, | Apr. 2010 |
| (79) <i>Queen Dido Conference on Isoperimetry</i> , Carthage, Tunisia | May. 2010 |
| (80) <i>Colloquium</i> , University of Tennessee, Knoxville, | Oct. 2010 |
| (81) <i>Geometry Seminar</i> , Stanford University, | Oct. 2010 |
| (82) <i>Bay Area Differential Geometry Seminar</i> , MSRI, | Oct. 2010 |
| (83) <i>Differential Geometry/Analysis Seminar</i> , Emory University, | Oct. 2010 |
| (84) <i>Southeast Geometry Conference</i> , Columbia, | May 2011 |
| (85) <i>Colloquium</i> , University of Alabama, Birmingham, | Oct. 2011 |
| (86) <i>Pacific Rim Geometry Conference</i> , Osaka, Japan, | Dec. 2011 |
| (87) <i>KIAS Winter School</i> , Seoul, Korea, | Feb. 2012 |
| (88) <i>Southeast Geometry Conference</i> , Charleston, | Mar. 2012 |
| (89) <i>Geometric Analysis Seminar</i> , University of Wisconsin, Madison, | Mar. 2013 |
| (90) <i>Conference on Encounters in Geometry</i> , Cabio Frio, Brazil | Jun. 2013 |
| (91) <i>Conference on Metric Geometry</i> , Banff Research Station, | Aug. 2013 |
| (92) <i>Geometry Seminar</i> , University of Toronto, | Nov. 2013 |
| (93) <i>Colloquium</i> , University of Toronto, | Nov. 2013 |
| (94) <i>Smoky Cascade Geometry Conference</i> , University of Tennessee, | Mar. 2014 |
| (95) <i>Differential Geometry Seminar</i> , Ohio State University, | Apr. 2014 |
| (96) <i>Geometry Seminar</i> , University of Georgia, | Dec. 2014 |
| (97) <i>College of Sciences EXPLORE Open House</i> , Georgia Tech, | Feb. 2015 |
| (98) <i>College of Sciences EXPLORE Open House</i> , Georgia Tech, | Apr. 2016 |
| (99) <i>Colloquium</i> , Penn State U., | Sep. 2016 |

| | |
|--|-----------|
| (100) <i>MASS Colloquium</i> , Penn State U., | Sep. 2016 |
| (101) <i>Conference on Geometric Inequalities</i> , Busan, South Korea, | Nov. 2016 |
| (102) <i>AMS Sectional</i> , Charleston, | Mar. 2017 |
| (103) <i>Colloquium</i> , Lehigh University, | Feb. 2018 |
| (104) <i>MAA State Dinner of SC</i> , Keynote speaker, Columbia, SC, | Nov. 2018 |
| (105) <i>Analysis Seminar</i> , Johns Hopkins U., | Sep. 2019 |
| (106) <i>Analysis Seminar</i> , Emory U., | Sep. 2019 |
| (107) <i>Research Horizons Seminar</i> , Georgia Tech, | Oct. 2019 |
| (108) <i>Colloquium</i> , Georgia Tech, | Oct. 2019 |
| (109) <i>Geometry and Topology Seminar</i> , U. Pennsylvania, | Oct. 2019 |
| (110) <i>Student Colloquium</i> , Penn State U., | Nov. 2019 |
| (111) <i>Colloquium</i> , Penn State U., | Nov. 2019 |
| (112) <i>Colloquium</i> , Stanford U., | Jan. 2020 |
| (113) <i>Geometric Analysis Seminar</i> , U. Chicago, | Jan. 2020 |
| (114) <i>Geometry Seminar</i> , Carnegie Mellon U., | Feb. 2020 |
| (115) <i>Colloquium</i> , Carnegie Mellon U., | Feb. 2020 |
| (116) <i>Joint Analysis Seminar</i> , UCLA/Caltech, | Apr. 2020 |
| (117) <i>Differential Geometry Seminar</i> , TU Vienna, | Oct. 2020 |
| (118) <i>Differential Geometry Seminar</i> , Max Plank Institute, | Nov. 2020 |
| (119) <i>Geometry and Topology Seminar</i> , U. Luxembourg, | Dec. 2020 |
| (120) <i>Differential Geometry Seminar</i> , Rice University, | Jan. 2021 |
| (121) <i>Frontiers in Mathematical Science</i> , IPM, Iran, | Apr. 2021 |
| (122) <i>Calculus of Variations and PDE Conference</i> , ETH, Zurich, | Jun. 2021 |
| (123) <i>Pangolin Seminar</i> , Online, | Oct. 2021 |
| (124) <i>Geometry Seminar</i> , UGA, | Apr. 2022 |
| (125) <i>Workshop in Convexity and Probability</i> , Georgia Tech, | May 2022 |
| (126) <i>Riemannian Geom. Conference</i> , Florence, | Jun. 2022 |
| (127) <i>Harmonic Analysis and Convexity</i> , ICERM, Brown U., | Sep. 2022 |
| (128) <i>Geometry and Topology Seminar</i> , Indian Institute of Science, Bangalore, | Oct. 2022 |
| (129) <i>Xavier Colloquium (Inaugural speaker)</i> , TCU, Fort-Woth, TX | Apr. 2023 |
| (130) <i>Texas Geometry and Topology Conference</i> , TCU, Fort-Woth, TX | Apr. 2023 |
| (131) <i>Geometry beyond Riemann, Summer School</i> , ESI, Vienna, | Sep. 2023 |
| (132) <i>Geometria Aljamilia</i> , Williams Papermaking Museum, Atlanta, Nov. 2023 | |

Undergraduate Research Supervised (REU projects)

- James Krysiak and Zachary McCoy, Penn State, Summer, 2004
- Arthur J. Friend, Georgia Tech, Fall 2006
- Brian Nakamura and Bobby DeMarco, Georgia Tech, Summer 2006
- Andrew McCullough, Georgia Tech, Summer 2012
- Arun Jambulapati, Georgia Tech (from U. Tennessee), Summer 2013
- Alena Kim, Alabama School of Fine Arts, Birmingham, Alabama, Fall 2014
- Biao Ma, Georgia Tech (from Jilin U., China), Spring 2016
- Tianhao Jian, Georgia Tech (from Jilin U., China), Spring 2016
- Nicholas Barvinok, Georgia Tech (from U. Michigan), Summer 2017
- Zetian Yan, Georgia Tech (from Jilin U., China), Summer 2018
- Devon Ingram, Georgia Tech, Summer 2018
- Alex Avery, Georgia Tech, Summer 2018
- Joshua Tso, Brandeis, Summer 2019

- Serge Blinov, Georgia Tech, Fall 2022

Graduate Student Supervision

- Yulia Tyurina, Penn State, PhD 2005 (supervised jointly with Serge Tabachnikov)
- James Wenk, Georgia Tech, PhD 2022 (won the best thesis award in the School of Math)
- Nicholas Barvinok, Georgia Tech, PhD 2023
- James Krysiak, Donald Sampson, Meredith Casey, Becca Winarski, Andrew McCullough, Hyun Ki Min (Reading courses at Georgia Tech).

Postdoc Supervision

Gordanna Stojanovic, Georgia Tech, 2007–2009.

Classes Taught

| | |
|---|-------------|
| (1) 110.302, <i>Differential Equations</i> , Johns Hopkins University, | Summer 1994 |
| (2) 110.201, <i>Linear Algebra</i> , Johns Hopkins University, | Summer 1996 |
| (3) Math100, <i>Introduction to Mathematical Proof</i> , UC Santa Cruz, | Fall 1998 |
| (4) Math11B, <i>Calculus with Applications</i> , UC Santa Cruz, | Fall 1998 |
| (5) Math22, <i>Calculus of Several Variables</i> , UC Santa Cruz, | Spring 1999 |
| (6) Math11B, <i>Calculus with Applications</i> , UC Santa Cruz, | Spring 1999 |
| (7) Math23B, <i>Multivariable Calculus</i> , UC Santa Cruz, | Fall 1999 |
| (8) Math121B, <i>Elem. Diff. Geometry & Topology</i> , UC Santa Cruz, | Winter 2000 |
| (9) Math19A, <i>Calculus for Science and Engineering</i> , UC Santa Cruz, | Winter 2000 |
| (10) Math19B, <i>Calculus for Science and Engineering</i> , UC Santa Cruz, | Spring 2000 |
| (11) Math141, <i>Calculus I</i> , U. South Carolina, | Fall 2000 |
| (12) Math241, <i>Vector Calculus</i> , U. South Carolina, | Fall 2000 |
| (13) Math544, <i>Linear Algebra</i> , U. South Carolina, | Spring 2001 |
| (14) Math142, <i>Calculus II</i> , U. South Carolina, | Fall 2001 |
| (15) Math550, <i>Vector Analysis</i> , U. South Carolina, | Fall 2001 |
| (16) Math142, <i>Calculus II</i> , U. South Carolina, | Spring 2002 |
| (17) Math550, <i>Vector Analysis</i> , U. South Carolina, | Spring 2002 |
| (18) Math142, <i>Calculus II</i> , U. South Carolina, | Fall 2002 |
| (19) Math734, <i>Differential Geometry</i> , U. South Carolina, | Fall 2002 |
| (20) Math141, <i>Calculus I</i> , U. South Carolina, | Spring 2003 |
| (21) Math598E, <i>Introduction to the h-Principle</i> , Penn State, | Fall 2003 |
| (22) Math426, <i>Introduction to Modern Geometry</i> , Penn State, | Spring 2004 |
| (23) Math497C, <i>Diff. Geometry of Curves & Surfaces</i> , Penn State, | Fall 2004 |
| (24) Math528, <i>Geometry and Topology II</i> , Penn State, | Spring 2005 |
| (25) Math 6452, <i>Differential Topology</i> , Georgia Tech, | Fall 2005 |
| (26) Math 2411, <i>Honors Calculus III</i> , Georgia Tech, | Spring 2006 |
| (27) Math 6455, <i>Differential Geometry I</i> , Georgia Tech, | Fall 2006 |
| (28) Math 6456, <i>Differential Geometry II</i> , Georgia Tech, | Spring 2007 |
| (29) Math 4441, <i>Differential Geometry</i> , Georgia Tech, | Fall 2007 |
| (30) Math 1502, <i>Calculus II</i> , Georgia Tech, | Spring 2008 |
| (31) Math 2401, <i>Calculus III</i> , Georgia Tech, | Fall 2008 |
| (32) Math 6457, <i>Geometry and Topology I</i> , Georgia Tech, | Fall 2009 |
| (33) Math 6458, <i>Geometry and Topology II</i> , Georgia Tech, | Spring 2010 |
| (34) Math 4432, <i>Intro. to Algebraic Topology</i> , Georgia Tech, | Spring 2010 |
| (35) Math 6455, <i>Differential Geometry I</i> , Georgia Tech, | Fall 2010 |
| (36) Math 6456, <i>Differential Geometry II</i> , Georgia Tech, | Spring 2011 |

| | |
|--|-------------|
| (37) Math 4432, <i>Intro. to Algebraic Topology</i> , Georgia Tech, | Spring 2011 |
| (38) Math 4441, <i>Differential Geometry</i> , Georgia Tech, | Fall 2011 |
| (39) Math 2401, <i>Calculus III</i> , Georgia Tech, | Spring 2012 |
| (40) Math 6455, <i>Differential Geometry II</i> , Georgia Tech, | Spring 2012 |
| (41) Math 1522, <i>Intro. to Linear Algebra</i> , Georgia Tech, | Summer 2012 |
| (42) Math 6457, <i>Geometry and Topology I</i> , Georgia Tech, | Fall 2012 |
| (43) Math 6458, <i>Geometry and Topology II</i> , Georgia Tech, | Spring 2013 |
| (44) Math 6455, <i>Differential Geometry I</i> , Georgia Tech, | Spring 2013 |
| (45) Math 4305, <i>Topics in Linear Algebra</i> , Georgia Tech, | Summer 2013 |
| (46) Math 4431, <i>Intro. to Topology</i> , Georgia Tech, | Fall 2013 |
| (47) Math 4320, <i>Complex Analysis</i> , Georgia Tech, | Spring 2014 |
| (48) Math 2411, <i>Honors Calculus III</i> , Georgia Tech, | Spring 2014 |
| (49) Math 4318, <i>Analysis II</i> , Georgia Tech, | Spring 2015 |
| (50) Math 6452, <i>Differential Topology</i> , Georgia Tech, | Fall 2015 |
| (51) Math 6455, <i>Differential Geometry</i> , Georgia Tech, | Spring 2016 |
| (52) Math 6452, <i>Differential Topology</i> , Georgia Tech, | Fall 2016 |
| (53) Math 4441, <i>Differential Geometry</i> , Georgia Tech, | Fall 2017 |
| (54) Math 6455, <i>Differential Geometry</i> , Georgia Tech, | Spring 2018 |
| (55) Math 4441, <i>Differential Geometry</i> , Georgia Tech, | Fall 2018 |
| (56) Math 6455, <i>Differential Geometry</i> , Georgia Tech, | Spring 2019 |
| (57) Math 8803, <i>Isometric Embeddings (Topics Class)</i> , Georgia Tech, | Fall 2019 |
| (58) Math 6455, <i>Differential Geometry</i> , Georgia Tech, | Spring 2021 |
| (59) Math 4441, <i>Differential Geometry</i> , Georgia Tech, | Fall 2021 |
| (60) Math 4318, <i>Analysis II</i> , Georgia Tech, | Spring 2022 |
| (61) Math 6455, <i>Differential Geometry</i> , Georgia Tech, | Spring 2022 |
| (62) Math 6452, <i>Differential Topology</i> , Georgia Tech, | Fall 2022 |
| (63) Math 2106, <i>Foundations of Mathematical Proof</i> , Georgia Tech, | Spring 2023 |
| (64) Math 6455, <i>Differential Geometry</i> , Georgia Tech, | Spring 2023 |
| (65) Math 6452, <i>Differential Topology</i> , Georgia Tech, | Fall 2023 |

Professional Service

- Co-organized a session (with Ralph Howard) on *Geometry of curves and surfaces* at the AMS southeastern section meeting, Mar. 2001.
- Co-organized a session (with Igor Belegradek) on *Riemannian Geometry* at the AMS national meeting, Jan. 2005.
- Co-organized the “Queen Dido Conference on Isoperimetric Problems”, Carthage, Tunisia, May 2010.
- Co-organizer of the *Southeast Geometry Seminar*, 2005–2017 (a semiannual series of conferences which rotated between Georgia Tech, Emory, and U. Alabama at Birmingham; see www.math.uab.edu/sgs).
- Reviewed papers for *Ann. Math.*, *Inventiones*, *J. Differential Geom.*, *Topology*, *Amer. J. Math.*, *J. Knot Theory Ramifications*, *Indiana Univ. Math. J.*, *Pacific J. Math.*, *J. Comput. Appl. Math.*, *P. Roy. Soc. Edinb. A*, *Math. Zeitschrift*, *Algebr. Geom. Topol.*, *Amer. Math. Monthly*, *J. Geom. Anal.*, *Geom. Dedicata*, *Bull. London Math. Soc.*, *Discrete Comput. Geom.*, *Arch. Math.*, *Tran. Amer. Math. Soc.*, *Nagoya Math. J.*, *Illinois J. Math.*, *Differential Geom. Appl.*, and *Mathematical Reviews*.
- Reviewed proposals for NSF and Simons Foundation.