Curriculum Vitae of Michael Dorff

Address

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Employment

- Associate chair, Dept. of Math., Brigham Young Univ., 2006–present.
- Visiting U.S. Fulbright scholar, Uniwersytet Marii Curie-Skłodowskiej (Poland), 2005–2006.
- Associate professor, Dept. of Math., Brigham Young Univ., 2004–present.
- Visiting assistant professor, Dept. of Math., Purdue Univ., winter 2003.
- Assistant professor, Dept. of Math., Brigham Young Univ., 2000–2004.
- Assistant professor, Dept. of Math. and Statistics, Univ. of Missouri–Rolla, 1997–2000.

Education

- Ph.D., Math., Univ. of Kentucky, 1997.
- M.S., Math., Univ. of New Hampshire, 1992.
- B.A., Math. Education, Brigham Young Univ., 1986.

Awards

- Distinguished Citizenship Award, BYU College of Physical and Mathematical Sciences, 2008.
- MAA Section Teaching Award, Mathematics Association of America, Intermountain Section, 2008.
- "Chancellor's Exceptional Teacher-Scholar Apprentice Award," University of Kentucky, 1997.
- "College Teaching Award," University of Kentucky Association of Emeriti Faculty, 1997.
- "Wimberly Royster Teaching Award," University of Kentucky Department of Mathematics, 1996.

Refereed Research Publications

- M. Dorff. "Minimal surfaces." Book chapter submitted for review.
- M. Dorff. "Harmonic univalent mappings." Book chapter submitted for review.
- M. Dorff, M. Nowak, and M. Woloszkiewicz. "Convolutions of harmonic mappings." Submitted for publication.
- E. Crofts, M. Dorff, and D. Ong. "The Lie symmetry groups of minimal surfaces." Submitted for publication.

- M. Dorff, S. Taylor, and M. Wołoszkiewicz. "Convex Combinations of Planar Harmonic Mappings and Minimal Graphs." Submitted for publication.
- M. Dorff, M. Nowak, and W. Szapiel. "Typically real harmonic functions." Submitted for publication.
- M. Dorff and J.–L. Marichal. "Some relations between volume and area of regions in $\mathbb{R}^n$." *Rocky Mountain J. Math.*. **37** (2007), no. 2, 551-572.
- M. Dorff and J. Szynal. "Linear invariance and integral operators of univalent functions." *Demonstratio Math.* **38** (2005), no. 1, 47-57.
- M. Dorff and J. Szynal. "Harmonic shears of elliptic integrals." *Rocky Mountain J. Math.*. **35** (2005), no. 2, 485-499.
- M. Dorff and M. Nowak. "Landau's Theorem for planar harmonic mappings." *Comput. Methods Funct. Theory* **4** (2004), no. 1, 151-158.
- M. Dorff, I. Naraniecka, and J. Szynal. "Doubly close-to-convex functions." *J. Math. Anal. Appl.* **290** (2004), 55-62.
- M. Dorff, "Minimal graphs in $\mathbb{R}^3$ over convex domains." *Proc. Amer. Math. Soc.* **132** (2004), 491-498.
- G. Jiang, T. Niederhauser, S. Davis, Y. Lua, M. Dorff, L. Howard, S. Magleby, and M. Linford. "Stability of Alkyl Monolayers on Chemomechanically Scribed Silicon to Air, Water, Hot Acid, and X-rays." *Colloids and Surfaces A: Physicochemical and Engineering Aspects* **226**, (2003), no. 1-3, 9-16. (note: my part was to use differential geometry to computationally model and analyze geometric objects that arose in their research. This paper was an extension of the previous paper by Linford and others.)
- M. Dorff, D. Halverson, and G. Lawlor. "Area-minimizing minimal graphs over nonconvex domains." *Pacific J. Math.* **210**, (2003), no. 2, 229-259.
- M. Dorff. "Convolutions of planar harmonic convex mappings." *Complex Var. Theory Appl.* **45** (2001), 263–271.
- T. Niederhauser, G. Jiang, Y. Lua, M. Dorff, D. Berges, and M. Linford. "A new process for preparing alkyl monolayers on silicon and patterning it by scribing in the presence of reactive species." *Langmuir* **17**, (2001), 5889-5900. (note: my part was to use differential geometry to computationally model and analyze geometric objects that arose in their research)
- M. Dorff. "Harmonic mappings onto asymmetric vertical strips." *Computational methods and function theory 1997 (Nicosia), Ser. Approx. Decompos. 11.* River Edge, NJ: World Sci. Publishing, 1999, 171–175.
- M. Dorff. "Some harmonic n-slit mappings." *Proc. Amer. Math. Soc.* **126** (1998), 569–576.
- M. Dorff and T. Suffridge. "The inner mapping radius of harmonic mappings of the unit disk." *Complex Var. Theory Appl.* **33** (1997), 97–103.

Other Refereed Publications

- B. Bailey, M. Budden, M. Dorff, and U. Ghosh-Dastidar. "Undergraduate Research: How Do We Begin?" *MAA Focus*, Jan. 2009, pp. 14-16.

- M. Dorff. "Center for Undergraduate Research in Mathematics (CURM) at Brigham Young University." *Proc. for Promoting Undergraduate Research in Math.*. ed. J. Gallian, Amer. Math. Soc., Providence, 2007, 245-249.
- M. Dorff. "Summer Mathematics Research Experience for Undergraduates (REU) at Brigham Young University." *Proc. for Promoting Undergraduate Research in Math.*. ed. J. Gallian, Amer. Math. Soc., Providence, 2007, 23-26.
- M. Dorff and L. Hall. "Solids in $\mathbb{R}^n$ whose area is the derivative of the volume." *The College Math. J.* **34** (2003), no. 5, 350-358.

Externally Funded Research Grants (excluding travel funds to conferences)

- PI, Conference on One and Several Complex Variables Conference, National Science Foundation (NSF). $14,800. 2008–2009.
- PI, Monograph on Complex Analysis Research Topics, a National Science Foundation (NSF) collaborative grant to write a book on current research topics related to complex analysis. My part involves writing a chapter on planar harmonic mappings and a chapter on minimal surfaces. There are 7 mathematicians involved in this project. I am the editor of the monograph. $137,391. 2007–2009.
- PI, a Research Fulbright Scholar award supporting a 5 month visit to conduct research and give research lectures at Katolicki Uniwersytet Lubelski and Maria Curie-Sklodowska Univ. (UMCS) in Poland. Uniwersytet Marii Curie-Skłodowskiej, $22,000. 2005–2006.
- PI, COBASE (Collaboration in Basic Science and Engineering) Program, a National Research Council (NRC) grant to support two 4-week research trips (one for me from the U.S. to Poland and the other for a colleague from Poland to the U.S.) to initiate collaborative research in mathematics. $8,400. 2003.
- PI, Harmonic Univalent Functions, Univ. of Missouri Research Board. $11,857. 1998.

Externally Funded Mentoring/Teaching Grants

- Co-PI, *EMSW21-MCTP: Center for Early Graduate Mentoring and Training*, a National Science Foundation (NSF) grant to establish sites at four U.S. universities (including BYU) at which nontraditional students (e.g., minorities, first generation university students, and undergraduates from small liberal arts colleges) can be mentored and brought up to speed while earning an M.S. degree in mathematics before they begin a Ph.D. program. The main site will be at Wake Forest University. $2,000,000. Pending.
- PI, *REU Site: Brigham Young University Undergraduate Research Experiences in Mathematics*, a National Science Foundation (NSF) grant to establish an 8-week summer national research center in mathematics at BYU for undergraduate students. $336,504. 2008–2012.
- PI, *Brigham Young University Mentoring Through Critical Transitions: EMSW21-MCTP*, a National Science Foundation (NSF) grant to establish a national center for undergraduate research in mathematics at BYU to train professors throughout the U.S. in successfully mentoring undergraduate students in research. $1,262,854. 2006–2010.

- PI, *Improving Elementary Math Instruction for All: A BYU-Public School Partnership Program*, Utah Office of Ed. (UOE) grant. This is a collaborative project with BYU CITES, BYU College of Ed., BYU College of Physical and Math. Sci., and 5 local Utah school districts (Alpine, Jordan, Nebo, Provo, and Wasatch) to improve math instruction in K-6 public schools. $513,000. 2006–2009.
- PI, *Brigham Young University Undergraduate Research Experiences in Mathematics*, a National Science Foundation (NSF) grant to establish an 8-week summer national research center in mathematics at BYU for undergraduate students. $158,166. 2005–2008.
- PI, *Tensor Grant* from the Math. Association of America/Tensor Foundation to support women participation in an undergraduate summer workshop. $5,000. 2002.

Internally Funded Grants (excluding university research funds)

- Co-PI and PI, *Undergraduate Research in Geometric Measure Theory*, a BYU "Environment for Mentoring" (MEG) grant to conduct research with undergraduate students at Brigham Young University. $14,150 (2003–2004), $14,150 (2004–2005), and $15,000 (2006–2007).

Selected List of Invited Research Talks at Universities and Conferences

- *Convex combinations of harmonic mappings*, mathematics department colloquium, Univ. of Northern Iowa, Apr. 2009, (full travel funds provided).
- *Convex combinations of harmonic mappings*, American Mathematical Society national meeting, Washington, D.C., Jan. 2009.
- *Convolutions of harmonic functions*, Geometric Function Theory Conference, Petrozavodsk, Russia, Jul. 2008.
- *Convolutions of harmonic convex functions*, workshop on Complex Analysis and Special Functions, Texas Tech Univ., Nov. 2007 (partial travel funds provided).
- *Harmonic mappings and minimal surfaces*, mathematics department colloquium, Calif. State Univ. Channel Islands, Oct. 2007, (partial travel funds provided).
- *Convolutions of harmonic convex functions*, AMS-PTM international conference, Warsaw, Poland, Aug. 2007.
- *Convolutions of harmonic functions*, Instytut Matematyki, Uniwersytet Marii Curie-Skłodowskiej, Lublin, Poland, May 2007 (partial travel funds provided).
- *Planar harmonic mappings and minimal surfaces*, a set of 5 lectures, Instytut Matematyki, Katolicki Uniwersytet Lubelski, Lublin Poland, Dec. 2005-Jan. 2006 (partial travel funds provided).
- *Research topics in complex analysis*, a set of 12 lectures, Instytut Matematyki, Uniwersytet Marii Curie-Skłodowskiej, Lublin, Poland, Oct. 2005-Jan. 2006.
- *Harmonic univalent mappings and Lie symmetries*, Computational Methods and Function Theory Conf., Joensuu, Finland, Jun. 2005.
- *Harmonic Shears of Elliptic Integrals*, Special Functions in Harmonic Analysis and Applications Conf., Irsee, Germany, Jul. 2004.

- *Landau's Theorem for planar harmonic mappings*, AMS/MAA national meeting, Phoenix, Arizona, Jan. 2004.
- *Minimal surfaces, planar harmonic mappings and convolutions*, Instytut Matematyki, Politechnika Rzeszowska, Rzeszów, Poland, June 2003.
- *Some results about minimal surfaces by way of planar harmonic mappings and geometric function theory*, Instytut Matematyki, Politechnika Łódzka, Łódż, Poland, June 2003.
- *Harmonic univalent mappings and minimal graphs in* $\mathbb{R}^3$, AMS regional meeting, Portland, Oregon, Jun. 2002.
- *Minimal graphs in* $\mathbb{R}^3$ *over convex domains*, AMS/MAA national meeting, San Diego, California, Jan. 2002.
- *Univalent harmonic mappings and minimal surfaces*, plenary speaker, The Show-Me State Lectures, St. Louis, Missouri, Apr. 2000.
- *Planar harmonic mappings, minimal surfaces, and convolutions*, Second International Workshop on Planar Harmonic Mappings, Technion, Haifa, Israel, Jan. 2000.

Selected List of Invited General Mathematics Talks

- Sigma Xi science lecture series, *Shortest paths, soap films, and the shape of the universe*, Univ. of Northern Iowa, Apr. 2009, (full travel funds provided).
- Mathematics colloquium "Harmonic mappings, minimal surfaces, and linear combinations" at Hampton University (an HBC), Mar. 2009.
- Mathematics colloquium "Harmonic mappings, minimal surfaces, and linear combinations" at Colorado College, Oct. 2008 (full travel funds provided).
- Mathematics colloquium "Minimal Surfaces and Steiner Problems" at Calif. Lutheran Univ., Oct. 2007, (partial travel funds provided).
- Presentation "Thoughts on Undergraduate Research" at Pepperdine Univ., Oct. 2007, (partial travel funds provided).
- Presentation "Center for Undergraduate Research in Mathematics (CURM)," at the AMS/MAA national meeting, New Orleans, Jan. 2007.
- Mathematics colloquium "Minimal Surfaces" at Southern Utah Univ., Oct. 2006.
- 50-minute presentation on "Shortest Paths, Soap Films, and Mathematics" for Calculus class at Lonepeak High School, Utah, May 2006.
- 50-minute presentation on "Derivatives of Areas and Volumes" for Calculus class at Timpview High School, Utah, May 2004.
- 75-minute in-service presentation on "Operations with fractions" for Provo Utah School District Middle-school mathematics teachers, Jan. 2004.
- University colloquium "Shortest Distance Between Points, Soap Films, and Mathematics," at Illinois College, Oct. 2003.
- Presentation "Mathematics and Soap Bubbles" at the Regional National Council of Teachers of Mathematics (NCTM) Conference (Salt Lake City, Utah), Oct. 2003.
- Mathematics colloquium "Minimal Surfaces," at BYU-Idaho, Sept. 2003.

Research Interests

Geometric function theory, complex analysis, and minimal surfaces.

Students Involved in Research since 2000

- M.S. students: Robert Berry, Lauritz Peterson, Steve Taylor.
- Undergraduate students: Tina Benhaim, Gia Bloomstrand, Laura Cannon, Amanda Clingerman, Evelyn Crofts, Diana Dimond, Karla Hendricks, Angela Hicks, Ryan Hubscher, Leah Jackman, Cami Jones, Darren Ong, Adam Rich, Ashley Swannack, Jared Whitehead.

Examples of National Service

- Director of National Programs
  - Director of the *Center for Undergraduate Research in Math* (CURM) at BYU funded by the National Science Foundation(NSF) for $1,262,854, 2006–2010 (see http://curm.byu.edu/).
  - Director of the *BYU Summer Math. Research Experience for Undergraduates* (REU) funded by NSF for $158,166, 2005–2008 (see http://math.byu.edu/reu/).
  - Director of the one-week *BYU Summer Mathematics Institute* for undergraduates, 2001–2004.
- National Committees
  - Math Association of America's (MAA) 11-person national committee for *Strategic Planning Working Group on STEM-related issues in Mathematics*, the MAA is the largest U.S. organization dedicated to the teaching and learning of undergraduate mathematics, member 2008-2011.
  - MAA national subcommittee on *Research By Undergraduates*, member 2007–2012, chair of committee 2009–2012.
  - MAA national committee on *Early Career Mathematicians*, member 2007–2012, chair of committee 2009–2012.
  - Consultant/Mentor for Project NExT (New Experiences in Teaching) which is a national MAA program to help new mathematics professors who are interested in improving the teaching and learning of undergraduate mathematics. Selected by the national organization to mentor Utah new math. professors: Jeff Blanchard (2008, Univ. of Utah); Frank Lynch (2006, Westminster College); David Brown (2005, Utah State Univ.); Bryna Kohler (2004, Utah State Univ.); and David Hartenstine (2002, Univ. of Utah).
- Reviewer for National Programs
  - Panel reviewer of grant proposals for the NSF program *Research Experiences for Undergraduates* (REU) for the Direcorate of Math. and Physical Sciences (DMS), Arlington, VA, Dec. 2003.
  - Member of the NSF site visit team to review the *Model Institutions for Excellence* grant proposal and participate in a site visit at Xavier Univ. of Louisiana, Aug. 2003.

  - Panel reviewer of grant proposals for the NSF *Course, Curriculum and Laboratory Improvement* (CCLI) program in the Division of Undergraduate Education (DUE), Washington D.C., July 2001, 2002, 2003. Chair of a panel, July 2002, 2003.
  - Reviewer for Research Grant Proposal in Analysis for DMS at NSF, 2002.
  - Editorial Board, *Involve: a journal of mathematics. Involve* is dedicated to showcasing and encouraging high quality mathematical research involving students (at all levels). All manuscripts accepted for publication in *Involve* should be publishable in quality journals in their respective fields, 2007–present.
  - Journal referee for: *J. Math. Anal. Appl.*; *Rocky Mountain J. Math.*; *Complex Var. Theory Appl.*; *Abstr. Appl. Anal.*; *Computers and Math. Appl.*; *Ann. Univ. Mariae Curie-Skłodowska Sect. A*; *Int. J. Math. Math. Sci.*; *Int. J. Comput. Math.*; *Appl. Math Letters*; *Math. Comp. Model.*, *Involve*, 2001–present.
  - Reviewer for the American Math. Society's Math. (AMS) Reviews, 2003–2006.
- Conference Organizer
  - Main organizer of the joint Center for Undergraduate Research in Mathematics (CURM) and MAA Intermountain Sectional Meeting at Brigham Young University, March 2009.
  - Main organizer of the "2008 One and Several Complex Variables Conference," at the University of Kentucky, May 2008.
  - Main organizer of the joint Center for Undergraduate Research in Mathematics (CURM) and MAA Intermountain Sectional Meeting at Brigham Young University, March 2008.
  - Co-organizer at the American Math. Society (AMS) and Polish Math. Society (PTM) International Conference for a special session in "Geometric Function Theory" in Warsaw, Poland, August 2007.
  - Co-organized the American Math. Society (AMS) special session on "Area-minimization and minimal surfaces," at AMS sectional meeting, in Salt Lake City, October 2002.

Examples of State/University Service

- Member of the Dean selection committee for the BYU College of Physical and Mathematical Sciences, 2007.
- Member of the Utah Office of Education Committee to evaluate the Utah State K-12 Mathematics Standards, 2006.
- Member of the BYU CITES (Center for the Improvement of Teaching Education and Schooling) Math Initiative Committee consisting of representatives from 5 local public school districts and BYU faculty with a commission from Dean Richard Young of the College of Education "to engage in an exploration of an approach to teaching numeracy which would be more effective in helping children to learn," 2004–present.

Examples of College/Department Service

- Associate chair (in charge of department activities related to the undergraduate program), BYU Dept. of Math., 2006–present
- Member of the College's Spring Research Planning Committee, 2007–present.

- Speaker on "Effective Teaching Strategies" at the College's Fall TA Training Workshop, 2006, 2007, 2008.
- Member of the BYU Math. Dept. Planning Committee, 2004–present.
- Chair of the Department's PR Committee, 2004–2005.
- Member of the Department's Graduate Committee, 2002–2006.

Professional Affiliations

- American Mathematical Society (AMS)
- Council on Undergraduate Research (CUR)
- Fulbright Association
- Mathematics Association of America (MAA)
- Project NExT (New Experiences in Teaching) Fellow.