Denise Marie Halverson

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Professional Employment

2007 – present	Associate Professor, Department of Mathematics, Brigham Young University
2001 – 2007	Assistant Professor, Department of Mathematics, Brigham Young University
1999 – 2001	Visiting Assistant Professor, Department of Mathematics, Brigham Young University

Education

Ph.D.	1994- 1999	Mathematics	University of Tennessee at Knoxville
M.S.	1992-1994	Mathematics	Brigham Young University
B.S.	1984-1989	Physics/Mathematics	Brigham Young University

Publications

R.J. Daverman and D.M. Halverson, The cell-like approximation theorem in dimension n=5, Fundamenta Mathematicae, 197 (2007) , 81-121. MR2365884

D.M. Halverson, L. Petersen, Projection decompositions of 0-dimensional sets, JP J. Geom. Topol. 7 (2007), no.3, 327-339. MR2371845.

D.M. Halverson, Detecting codimension one manifold factors with 0-stitched disks, Topology Appl. 154 (2007), no. 9, 1993-1998. MR2319721

J. J. Cox, B.L. Adams, D.T. Fullwood, and D.M. Halverson, Heterogeneous design optimization from the microstructure. Proceedings of IDETC/CIE 2006, ASME 2006 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, September 10-13, 2006, Philadelphia, Pennsylvania, USA. DETC2006-99157. (Refereed Paper)

D.M. Halverson and G.R. Lawlor, Area-minimizing subsurfaces of Scherk's singly periodic surface and the catenoid. Calc. Var. Partial Differential Equations 25 (2006), no. 2, 257--273. MR2188749

R.J. Daverman and D.M Halverson, Path concordances as detectors of codimension one manifold factors. Proceedings of the Oberwolfach Miniworkshop on Exotic Manifolds. Geometry & Topology Monographs 9 (2006)

7-15. MR2222487

D.M. Halverson, 2-ghastly spaces with the disjoint homotopies property: The method of fractured maps. Topology Appl. 138 (2004), no. 1-3, 277--286. MR2035486 (2004k:57030)

M.J. Dorff, D.M. Halverson and G.R. Lawlor, Area minimizing minimal graphs over non-convex domains. Pacific Journal of Mathematics, 210 (2003), no. 2, 229--259. MR1988533 (2004e:49060)

D.M. Halverson, Detecting codimension one manifold factors with thedisjoint homotopies property. Topology Appl. 117 (2002), no. 3, 231--258. MR1874088 (2002k:57055)

D.M. Halverson and D.G. Wright, Linearly opaque homeomorphisms of Rn. Proceedings of the 2000 Topology and Dynamics Conference (San Antonio, TX). Topology Proc. 25 (2000), Spring, 167--180. MR1875589 (2002m:57029)

Invited Talks* and Presentations

2007* "Detecting codimension one manifold factors with topographical techniques", Joint PTM-AMS Meeting, Warsaw, Poland, July 31-August 3, 2007.

2007   "Detecting codimension one manifold factors with the plentiful singular 2-manifold property", 24th Annual Workshop in Geometric Topology, Grand Rapids, Michigan, June 28-30, 2007.

2007* "The Busemann Conjecture: A survey, University of Ljubljana Mathematics Colloquium, Ljubljana, Slovenia, May 18, 2007.

2007   "Survey on length minimization problems on non-planar surfaces", Spring Topology and Dynamical Systems Conference, Rolla Missouri, March 29-31, 2007.

2006* "Detecting codimension one manifold factors with general position properties", Institute of Mathematics, Physics, and Mechanics, Ljubljana, Slovenia, August 23, 2006.

2006   "Second Order Microstructure Sensitive Design and Topological Considerations" Computational Homology and Materials Science Workshop, Georgia Tech Global Learning & Conference Center, Atlanta, Georgia, February 2-4, 2006. Presented with Brent Adams (main author).

2005   "General Position Properties of codimension one manifold factors". International Conference and Workshops on Geometric Topology, Mathematical Research and Conference Center, Bedlewo, Poland, July 3-10, 2005.

2005 "Detecting codimension one manifold factors with 0-stitched disks". The
Twenty-Second Annual Workshop in Geometric Topology, The Colorado College
Colorado Springs, Colorado, June 9-11, 2005.

2004* "The proof of the Cell-like Approximation Theorem in dimension 5". Special
Session on Geometric Topology in Honor of John Bryant at the 99th AMS
Meeting, Tallahassee, Florida, March 12-13, 2004.

2004 "Approximating cell-like maps by cellular maps". Twenty-first Annual
Workshop in Geometric Topology, University of Wisconsin-Milwaukee,
June 10-12, 2004.

2003* "Bizarre spaces whose product with a line is a manifold", Miniworkshop on
Exotic Manifolds, Oberwolfach, Germany, June 29 – July 4, 2003.

2002 "Area minimizing minimal graphs over non convex domains", Special Session on
 Area-Minimization and Minimal Surfaces, AMS Conference, Salt Lake City,
Utah, October 26-27, 2002.

2001 "2-ghastly spaces with the disjoint homotopies property: the method of fractured
maps", Spring Topology and Dynamics Conference, Morellia, Mexico, 2001.

2001 "The method of delta-fractured maps and 2-ghastly spaces with the disjoint
homotopies property",18th Annual Workshop in Geometric Topology, Oregon
State University, Corvallis, OR, 2001.

2000 "Linearly opaque homeomorphisms of R^n ", Spring Topology and Dynamics
Conference, San Antonio, TX, March, 2000.

1998 "Applications of the disjoint homotopies property", The International Conference
on Geometric Topology. Dubrovnik, Croatia, 1998.

1998 "Ghastly Generalized Manifolds with the Plentiful 2-Manifolds Property",
 Fifteenth Annual Workshop in Geometric Topology. Park City, Utah, 1998.

1998 "Disjoint homotopies results for generalized manifolds", Spring Topology and
Dynamics Conference, Fairfax, Virginia, 1998.

Faculty Service

Fall 2007	Engineering Math Coordinator
Winter 2007	Math 302 Coordinator, Undergraduate Activities Coordinator,
2006	Math 302 Coordinator, Undergraduate Activities Coordinator, Q Committee

Fall 2005	Co-coordinator for Math 302, Undergraduate Activities Coordinator, Q Committee
2004 - 2005	Undergraduate Activities Coordinator, Q Committee (Committee for Department Relations)
Winter 2004	Topology Definitions Committee Chair
2001 - 2004	Engineering Math Coordinator
2001 - 2002	State Math Contest Committee
Winter 2000	Teaching Committee

Grants

External Grants Received:

- NSF Grant, "REU Site: Brigham Young University Undergraduate Research Experiences in Mathematics" for summers 2008-2011. *Principal Investigator:* Michael Dorff. *Co-Investigators:* Denise Halverson, Gary Lawlor, and Scott Glasgow. ($336,504)

- NSF Grant, "EMSW21-MCTP: Center for Mentoring Undergraduate Research in Mathematics". *Principal Investigator:* Michael Dorff. *Co-Investigators:* Jeffrey Humphreys, Denise Halverson, Tyler Jarvis. ($1,284,208)

- NSF Grant, "REU Site: Brigham Young University Undergraduate Research Experiences in Mathematics" for summers 2005-2008. *Principal Investigator:* Michael Dorff. *Co-Investigators:* Gary Lawlor, Denise Halverson, and Scott Glasgow. ($159,000)

- Travel Grant to the American Institute of Mathematics, "Workshop on Moduli Spaces of Properly Embedded Minimal Surfaces", California, Palo Alto, California, June 6-10, 2005. Trip fully funded (est. $1200)

- Travel Grant to Clay Mathematics Institutes Summer School on "The Global Theory of Minimal Surfaces" at the Mathematical Sciences Research Institute (MSRI) in Berkeley, California, June-July 2001. ($1867)

Internal Grants Received:

- BYU Mentoring Environments Grant, "Mathematical research on geometric optimization problems" for the academic year 2006-2007. *Principal Investigator*: Denise Halverson. *Co-Investigators*: Gary Lawlor, Michael Dorff. ($14,316)

- BYU Mentoring Environments Grant for "Mathematical research on geometric optimization problems" for the academic year 2003-2004. *Principal Investigator*: Denise Halverson. *Co-Investigators*: Gary Lawlor, Michael Dorff. ($18,750)

- BYU Mentoring Environments Grant for "Undergraduate research experience in geometry" for the academic year 2003-2004. *Principal Investigator*: Michael Dorff. *Co-Investigators*: Gary Lawlor, Denise Halverson. ($14,150)

Teaching Awards

2005	College of Physical and Mathematical Sciences Teaching Award
1998	Dorethea and Edgar D. Eaves Teaching Award for Outstanding Graduate Teaching

Research Mentoring

Graduate

2007-2008	Matt Adams, Masters Project, *Homological Effects on Material Properties*

Undergraduate

2007-2008	Donald Sampson, *The Steiner Problem on Narrow and Wide Cones, continued* (Supported by BYU MEG)
Summer 2007	Lauren Sipe and Tara Brune, *The Steiner Problem on a Regular Tetrahedron* (Supported by NSF REU) Joshua Lytle and Amber Lee, *The Steiner Problem on Narrow and Wide Cones* (Supported by NSF REU)
2006-2007	Chul-Woo Lee and Jared Duke, *Coarse Geometry in Microstructure Design* (Supported by BYU MEG)
Summer 2006	Caroline Nielson, Jamie Burwood, *Length Minimization Problems on Polohedra* (Supported by NSF REU) Luke Muggy, Daniel Murphree, *Length Minimization Problems on the Projective Plane* (Supported by NSF REU) Keith Penrod, *The three point Steiner problem on a torus.*
2005-2006	Greg Miller, Keith Penrod, Katie May, Melissa Mitchell, *Steiner problems on surfaces of constant curvature* (Supported by BYU MEG)
2004-2005	Greg Miller, Don March, *An algorithm for solving Steiner problems in the hyperbolic plane and the sphere* (Supported by BYU MEG)
2004	Greg Miller, *The proof of a four point Steiner problem in hyperbolic space* Don March, *An improved naming scheme for Steiner topologies and conjectures to evolution of solutions to Steiner problems in hyperbolic space*
2003-2004	Ilya Raykhel and Scott McEuen, *Length Minimization Problems*

(Supported by BYU MEG)

2003   Lauritz Peterson and Joshua Hunter, *The Steiner problem in hyperbolicspace*. (Lauritz was supported by a BYU ORCA grant.)

       2002   Lauritz Peterson, *Characterizing nice complementary sets in the plane*.

Women in Science Activities

- <u>Undergraduate Seminar for Women in Math, Science and Engineering</u>

The purpose of the seminar is to give encouragement and support to women who are pursuing careers in the hard sciences.

- <u>Career Connections</u>

The goal of this project is to help women students connect into careers in mathematics, science, and engineering that meet their life needs and allow them to contribute their talents and abilities to bless the lives of others through both family and professional endeavors. In the first phase of the project we have begun a website that provides helpful information about career opportunities and educational requirements. The website also provides helpful information on how to negotiate careers and family.