

Brian M. Loft

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Education

Ph.D. in Mathematics, University of Oregon, Eugene, 2004.
Dissertation: “Connected components of the space of positive scalar curvature metrics on spheres.” Advisor: Dr. Boris Botvinnik.

M.S. in Mathematics, Southwest Texas State University, San Marcos, December 1998.

B.S. in Mathematics, Louisiana Tech University, Ruston, November 1993.

Professional Experience

Assistant Professor, Fall 2004 – present.
Department of Mathematics and Statistics, Sam Houston State University.

Graduate Teaching Fellow, Fall 1999 – Spring 2004.
Department of Mathematics, University of Oregon.

Visiting Instructor, Spring 1999.
Department of Mathematics, Concordia University, Austin, TX.

Actuary, October 1994 – November 1995.
FIC Insurance Group, Austin, TX.

Research Publications

Loft, B., “A generalization of a result of Hajduk concerning positive scalar curvature”, *JP Journal of Geometry and Topology*, Vol. 8, No. 3, 2008.

Loft, B. and Snow, J., “A genetic algorithm for drawing ordered sets,” *Texas College Mathematics Journal*, Vol. 3, 2006.

Loft, B. and Scariano, S., “A serendipitous path to Taylor’s theorem”, accepted, to appear in *Mathematics and Computer Education*.

Garcia, R., Lane, M. and Loft, B., “Algebraic combinatorics of magic n -circles”, submitted to *Mathematics and Computers in Simulation, Transactions of IMACS*.

Loft, B., ”A new model to use when teaching Euclidean geometry”, submitted to *Forum Geometricorum*.

Loft, B., Lutterschmidt, W., Grey, C., “A species-specific model for computing surface area to volume ratio of snakes”, in preparation

Loft, B., Williams, D., Green, J., “An algorithm for the determination of HSP for Cleaning Applications”, in preparation

Synergistic Publications

Loft, B. and Holt, M., “Increasing STEM graduation rates at SHSU”, to appear in *Int. J. of App. Geospatial Research*, Vol. 1, Issue 3, 2010.

Honors, Grants & Awards	<p>NSF REU grant (09-598), Co-PI with R. Garcia, \$525,000 award pending. A \$1.2 mill. collaborative hybrid REU site with the University of Hawai'i - Hilo.</p> <p>NSF S-STEM grant (07-524), PI, awarded \$600,000 in 2008. A research & scholarship grant meant to increase the retention of STEM majors.</p> <p>Dept. of Energy, B & W Pantex, Co-PI with D. Williams, awarded \$100,000, 2008. A project to optimize the solubility of polymers using Hansen solubility parameters.</p> <p>Enhancement Grant for Research, Co-PI with R. Garcia, awarded \$18,000 in 2009. A planning grant for the pending NSF REU proposal submitted in October 2009.</p> <p>Center for Undergraduate Research in Mathematics, PI, awarded \$16,000 in 2008. An undergraduate research and travel grant for the PI and three students.</p> <p>Educational Advancement Foundation, PI, awarded \$7,170 in Fall 2004. Used to develop IBL course notes for a <i>Mathematica</i>-assisted linear algebra course.</p> <p>NSF STEP grant (06-502), PI, proposed in 2006 for \$990,000, denied. Meant to increase undergraduate research and the recruitment of math & biology majors.</p> <p>NSF STEP grant (06-502), Co-PI w/T. Primm, prop in 2006 for \$1,000,000, denied. A resubmission of the previously denied S-STEM proposal.</p>
Research Interests	Differential topology, with emphasis on Surgery and Cobordism theories, and the affects on the existence and structure of metrics of positive scalar curvature.
Undergraduate Research	<p>C. Grey: calculation of a species-specific model for computing the volume and surface area of snakes, Fall 2009 – present.</p> <p>C. Bankhead, A. Voth, & K. Woods: discrete curvature, discrete Morse theory and the Gauss-Bonnet theorem, funded by CURM, Fall 2008-Spring 2009.</p> <p>J. Green: determining optimal mixture rates of solvents for dissolution of explosive polymers, Spring 2007.</p> <p>S. Demel: examining the distribution of prime numbers that arise from the \hat{A}-genus of a family of smooth manifolds, Spring 2006.</p> <p>K. Silence: reading a paper on modeling the alignment of animals in time and space, Spring 2006.</p> <p>S. Alnasleh: modeling the geometric properties of ratchet growth in the compound TATB, Spring 2006.</p>
Graduate Research	<p>M. Rivas: graduate research advisor, Fall 2006 - Spring 2008.</p> <p>K. Kurban: oral examination committee member, Fall 2005.</p>
Synergistic Activities	Attempted (twice) to establish a bio-mathematics Bearkat Learning Community with then Associate Dean Keri Rogers.

**Professional
Development****Project NExT Fellow**

Exxon-Mobil foundation fellow for 2005-2007 Project NExT, a program of the MAA.

Texas NExT Fellow

Texas section of the national organization, 2004-2006.

Shortcourse Attendee

Applications of Knot Theory, Joint meetings, 2008.

Minicourse Attendee.

Mathematics and Geometry of Voting Methods, Joint meetings, 2008.

Shortcourse Attendee

Algebraic Coding Theory, TX A&M University, May 2006.

Workshop Attendee

Improving the Teaching of Euclidean Geometry, MathFest, 2006.

Workshop Attendee

Workshop on Training Teaching Assistants – A Case-study Approach, MathFest, 2005.

Organizer

Discrete Morse theory departmental faculty seminar, Fall 2008 – Spring 2009.

**Conferences
Attended****Joint Meetings of the AMS and MAA**

Phoenix (2004), Atlanta (2005), San Antonio (2006), New Orleans (2007), San Diego (2008), Washington (2009), San Francisco (2010).

MAA MathFest

Albuquerque (2005), Knoxville (2006), Portland (2009).

Pacific Northwest Geometry Seminar

Eugene (Fall 2004), Seattle (May 2005), Stanford (February 2006), SLC (April 2007).

Texas Geometry and Topology Conference

Texas A&M (Fall 2004), UH (Spring 2006), Rice (Fall 2006), TCU (Spring 2007), TX A&M (Fall 2007).

Legacy of R.L. Moore Conference

Austin (2005, 2006, 2007, 2008, 2009).

Texas Undergraduate Mathematics Conference

SHSU (2005, 2006, 2007).

String Topology Workshop

Stanford (March 2008).

Riemannian Topology Conference, a celebration of C. Boyer's 65th birthday

University of New Mexico (October 2007).

Texas Algebraic Geometry Seminar

Texas A&M (May 2006).

Singularities in Analysis, Geometry & Topology, honoring Harvey & Polking

Rice University (November 2005).

Positive Scalar Curvature and Related Topics

Munich, Germany, (February 2004).

Teaching Experience	<p>Graduate Courses – designed each course. Complex Analysis (MTH 579), Spring 2005. Differential Geometry(MTH 560), Fall 2006. Differential Topology (MTH 570), Fall 2009. Topology (MTH 632), Spring 2010.</p> <p>Taught using IBL (or Moore) method Linear Algebra (MTH 377), Spring 2006. Foundations of Mathematics (MTH 364), Spring 2008. Euclidean Geometry (MTH 363), Spring 2009. Mathematics of Voting Methods (MTH 164H), Fall 2009.</p> <p>IDEA results – averages weighted by class size, for 24 sections taught. Excellent Teacher: 4.6 out of 5.0 (“Outstanding”) Summary Evaluation: 4.2 out of 5.0 (“Excellent”)</p> <p>Other accomplishments Designed and taught an section of MTH 164 for the SHSU Honors College, Fall 2009. Used sustainability data in differential calculus course, Spring 2009.</p>
Presentations	<p>“Spherical modifications”, University of Dallas (2006), SHSU, 60 min. (2005). “Using the Hansen solubility parameters”, University of Dallas, 60 min. (2007). “A deterministic model for snakes”, Univ. of Dallas, 60 min. (2009); SHSU, 60 min. (2009). “Connected components of the space of p.s.c. metrics”, Joint meetings, 20 min. (2005); TX MAA meeting, 20 min. (2005). “A generalization of a result of Hajduk”, UO Geometry seminar, 60 min. (2005). “An interesting fact about prime numbers and surgery”, SHSU, 60 min. (2006). “Surgery and scalar curvature”, TX State Univ. - San Marcos, 60 min. (2005). “An introduction to cryptography”, TUMC, 15 min. (2007). “So you want to be an actuary.”, SFA, 60 min. (2008). “The life of a mathematician.”, SHSU Up Close & Personal series, 60 min. (2009). “Using <i>Chapter Zero</i> in a transitions course”, Legacy of RL Moore, 20 min. (2008).</p>
Memberships	<p>American Mathematical Society Member, 1996 – present. Mathematical Association of America Member, 1996 – present. Society of Actuaries, 1994 – 1995.</p>

Highlights of Service Activities

University Service

Member, Faculty Senate, Fall 2005 – present.

Member, University Affairs Committee of Senate, Fall '05 – Spring '08 (chair for 1 year).

Member, Faculty Affairs Committee of Senate, Fall '08 – Spring '10 (chair for 1 year).

Member, President's QEP Committee, Fall '08 – Fall '09 (chair for 1 year).

Designed the Foundations of Science course as part of SACS assessment.

Attendee, annual meeting of TX Council of Faculty Senates, Austin, Spring 2008.

Attendee of the TAMEST conference, San Antonio, Spring 2010.

The annual meeting of The Academy of Medicine, Engineering, and Science of Texas.

Faculty mentor (for student C. Combs) through FLASH Mentor program, 2008 – 2009.

College Service

Instructor, GRE prep course, twelve times.

Designed both 4- and 6-hour tutorial for students preparing for the GRE examination.

Judge, SHSU Academic Challenge, annually 2004-2009.

Moderator, UIL competition, Spring 2008 & 2009.

Performed analysis of recent enrollment data in our remedial courses (MTH 031/032).

Compiled IR data on enrollment, retention, and graduation rates of remedial students.

Served on the doctoral committee of Kevin Perry, Dept. of Philosophy and Psychology

Departmental Service

Member, Departmental Hiring Committee, ten of the twelve semesters at SHSU.

Coordinator of Teaching Assistants, Fall 2005 – Spring 2007

Held weekly seminars to improve effectiveness, made assignments for TA duties.

Coordinator of undergraduate tutoring lab, Fall 2005 – Spring 2008

Recruit, assign, and organize undergraduates for math tutoring lab.

Coordinator of undergraduate employees, Fall 2005 – present

Recruit, assign, and organize undergraduate graders.

Representative of Mathematics Department during Saturdays@Sam, several semesters.

Taught rest of MTH 377 after Dr. Andras Kroo left with health troubles, Spring 2009.

Instructor of independent study courses for 1-2 students

Spring 2008 (MTH 477), Fall 2008 (MTH 363), Spring 2009 (MTH 470 & MTH 363).

Sponsor of a weekly study session for two students studying for first actuarial exam (P1).

Advisor, student chapter of MAA, Fall 2009 – Spring 2010

Professional Service

Panel reviewer, NSF S-STEM program, Spring 2008, Fall 2008, Fall 2009.

Panel reviewer, NSF MSP program, Spring 2008.

Each panel is 3-5 days in Washington, DC.

Panel reviewer, NIH Challenge grants, Summer 2008.

Panelist during “The First Year Experience as as Faculty Member”, MathFest, 2005.

Panel of Experienced Graduate Students, September 2002.

Advised incoming graduate students on teaching, choosing an advisor, other aspects.

Judge at undergraduate poster session, Joint meetings, 2004-2010.

Community Service

Instructor of English for non-native speakers, Huntsville Literacy Council, Spring 2009.