

Curriculum Vitae

Craig R. Guilbault

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Education

- Ph.D. University of Tennessee, Knoxville, 1988

Thesis: *Some Results in the Study of Noncompact 4-manifolds*

Thesis Advisor: Robert J. Daverman

- B.S. Northland College, Ashland, Wisconsin, 1982

Magna Cum Laude with Honors in Mathematics

Professional Experience

- 2003-present Professor, University of Wisconsin-Milwaukee
– Graduate Program Coordinator (2008-2012)
- 1995-2003 Associate Professor, University of Wisconsin-Milwaukee
- 1989-95 Assistant Professor, University of Wisconsin-Milwaukee
- 1988-89 Assistant Professor, Ithaca College

Editorial Work

- Editor for *Topology Proceedings* (2015-present)
- Co-editor of special issue of the journal *Topology and its Applications* dedicated to AMS special session in Geometric Topology and Geometric Group Theory held in Milwaukee, Wisconsin, October 24-25, 1997
- Co-editor of the informal *Proceedings of the Workshop Geometric Topology*, 1991-2012 (primary editor in 1991, 1995, 1999, 2004 and 2009)

Other professional Service

- Organizer of the annual *Workshop in Geometric Topology*, 1991-present (co-principal organizer in 1991, 1995, 1999, 2004, 2009, and 2014; assistant organizer other years).
- Co-organizer of *Special Session in Geometric Topology and Geometric Group Theory*, AMS Sectional Meeting, Milwaukee, Wisconsin, October 24-25, 1997.
- Co-organizer of *Special Session in Geometric Topology and Geometric Group Theory*, at the Thirty-Ninth Spring Topology and Dynamics Conference, Berry College, Mount Berry, GA, March 17-19, 2005
- Co-organizer of *Special Session in Geometric Topology and Geometric Group Theory* at the Forty-First Spring Topology and Dynamics Conference, University of Missouri-Rolla, Rolla, MO, March 29-31, 2007
- Co-organizer of the Forty-Second Spring Topology and Dynamics Conference, Milwaukee, WI, March 13-15, 2008

- Co-organizer of *Special Session in Geometric Topology and Geometric Group Theory* at the Forty-Sixth Spring Topology and Dynamics Conference, UNAM in Mexico City, March 22-24, 2012
- Co-organizer of *Special Session in Geometric Topology*, AMS Sectional Meeting, Knoxville, TN, March 21-23, 2014.
- Member of the Spring Topology and Dynamics Conference Steering Committee, 2008-present
- Referee for the journals: *Expositiones Mathematicae*, *Fundamenta Mathematicae*, *Geometry & Topology*, *International Mathematics Research Announcements*, *Proceedings of the American Mathematical Society*, *Rocky Mountain Journal of Mathematics*, *Topology*, *Topology and its Applications*, *Algebraic & Geometric Topology*, *Transactions of the American Mathematical Society*, *Proceedings of the London Mathematical Society*, *Geometriae Dedicata*, *Science China Mathematics*, *Journal of Topology*, *Izvestiya: Mathematics*.
- Reviewer of articles for *Mathematical Reviews*
- Reviewer of articles for *Zentralblatt*
- Reviewer of grant proposals for the National Science Foundation

Grants

Individual Research Grants:

- *Boundaries and End Structures for Noncompact Manifolds and Groups*, NSF Grant DMS-0072786. Duration: 7/00-6/03. Amount awarded: \$77,061.
- *Collaborations in geometric topology and geometric group theory*, Simons Foundation Collaboration Grant. Duration: 7/1/11-8/31/16. Amount awarded: \$35,000.

NSF Conference Grants:

- *Workshops in Geometric Topology*, Co-principal investigator (with F. Ancel, D. Garity, J. Henderson, F. Tinsley) on NSF Grant DMS-9101515. Duration 6/91-11/94. Amount awarded: \$21,900.
- *Workshops in Geometric Topology*, Principal investigator (with co-PIs F. Ancel, D. Garity, F. Tinsley and D. Wright) on NSF Grant DMS-9401185. Duration 2/95-1/98. Amount awarded: \$27,900.
- *Workshops in Geometric Topology*, Principal investigator (with co-PIs F. Ancel, D. Garity, F. Tinsley and D. Wright) on NSF Grant DMS-980261. Duration 7/98-6/01. Amount awarded: \$30,928.
- *Workshops in Geometric Topology*, Principal investigator (with co-PIs F. Ancel, D. Garity, F. Tinsley, Gerard Venema and D. Wright) on NSF Grant DMS-0101325. Duration 6/01-6/04. Amount Awarded: \$32,037.
- *Workshops in Geometric Topology*, Principal investigator (with co-PIs F. Ancel, D. Garity, F. Tinsley, Gerard Venema) on NSF Grant DMS-0407583. In addition to the 2004-2006 Workshops in Geometric Topology, this grant includes funding for a project spearheaded by Ancel, Guilbault and Venema to arrange for publication of a series of famous unpublished works by R.D. Edwards. Duration 06/01/04-05/31/07. Amount awarded: \$56,151.

- *Workshops in Geometric Topology*, Principal investigator (with co-PIs F. Ancel, F. Tinsley, Gerard Venema and D. Wright) on NSF Grant DMS-0707489. Duration 8/07-7/10. Amount Awarded: \$37,108.
- *Spring Topology and Dynamics Conference 2008*. Principal investigator (with co-PIs Suzanne Hruska, Chris Hruska, Karen Brucks and Paul Bankston) on NSF Grant DMS-0754254. Duration: 2/15/08-2/15/09. Amount awarded: \$44,800.
- *Workshops in Geometric Topology*, Principal investigator (with co-PIs F. Ancel, E. Swenson, F. Tinsley, G. Venema and D. Wright) on NSF Grant DMS-1005906. Duration 6/1/10-5/31/2014. Amount Awarded: \$67,300.
- *Workshops in Geometric Topology*, Principal investigator (with co-PIs F. Ancel, G. Friedman, E. Swenson, F. Tinsley, G. Venema) on NSF Grant DMS-1461385. Duration 6/1/15-5/31/2018. Amount Awarded: \$50,166.

Federal Grants Related to Graduate and Undergraduate Education:

- Senior Personnel on NSF grant *Milwaukee Mathematics Partnerships: Sharing in Leadership for Student Success*. (EHR-0314898). Duration 9/03-9/08. Amount: \$19,997,173.
- Principal Investigator (with R. Stockbridge), *Graduate Assistance in Areas of National Need Fellowship Program*, grant number P200A090021, U.S. Department of Education Office of Postsecondary Education, 8/09-8/12, Amount: \$653,280.
- Co-Principal Investigator (with R. Stockbridge), *Graduate Assistance in Areas of National Need Fellowship Program*, grant number P200A100084, U.S. Department of Education Office of Postsecondary Education, 9/10-9/13, Amount: \$522,624.
- Co-Principal Investigator (with R. Stockbridge), *Graduate Assistance in Areas of National Need Fellowship Program*, grant number P200A120082, U.S. Department of Education Office of Postsecondary Education, 9/12-9/15, Amount: \$408,315.

Internal Grants:

- *The Topology of Compact Contractible Manifolds*, University of Wisconsin-Milwaukee Graduate School Research Award, summer 1994. Amount awarded: \$4,415.11.
- *Training and Mentoring of Teaching Assistants in the UWM Mathematics Department*, Participant as faculty mentor in grant awarded by the Center for Instructional and Professional Development (at UWM). Duration 9/3/98-5/15/99. Amount: \$3,500.

Graduate Students

- Jörg Marhenke, MS Spring 2002
- Margaret May, PhD, Summer 2007
- Christopher Mooney, PhD, Spring 2008
- Carrie Tirel, PhD, Summer 2010
- Pete Sparks, PhD, Fall 2014
- Jeffrey Rolland, PhD, Spring 2015
- Jason LaCorte, PhD, Spring 2015
- Molly Moran, PhD, Spring 2015

Publications

Refereed Publications:

- (1) *An open collar theorem for 4-manifolds*, Trans. Amer. Math. Soc. **331**(1992), 227-245.
- (2) *An extension of Rourke's proof that $\Omega_3 = 0$ to non-orientable manifolds*, Proc. Amer. Math. Soc. **115**(1992), 283-291 (with F.D. Ancel).
- (3) *Homology lens spaces and Dehn surgery on homology spheres*, Fund. Math. **144**(1994), 287-292.
- (4) *Non-collarable ends of 4-manifolds: some realization theorems*, Mich. Math. J. **41**(1994), 87-95.
- (5) *Linked pairs of contractible polyhedra in S^n* , Proc. Amer. Math. Soc. **121**(1994), 1271-1274.
- (6) *Compact contractible n -manifolds have arc spines ($n \geq 5$)*, Pacific J. Math. **168**(1995), 1-10 (with F.D. Ancel).
- (7) *Some compact contractible manifolds containing disjoint spines*, Topology **34**(1995), 99-108.
- (8) *Mapping swirls and pseudo-spines of compact 4-manifolds*, Topology and its Appl. **71**(1996), 277-293 (with F.D. Ancel).
- (9) *CAT(0) reflection manifolds*, Geometric Topology, W.H. Kazez editor, American Math. Soc./International Press Studies in Advanced Mathematics, Vol. 2, Part 1, 1997, 441-445 (with F.D. Ancel and M.W. Davis).
- (10) *Interiors of compact contractible n -manifolds are hyperbolic ($n \geq 5$)*, J. Differential Geometry **45**(1997), 1-32 (with F.D. Ancel).
- (11) *\mathcal{Z} -compactifications of open manifolds*, Topology **38**(1999), 1265-1280 (with F.D. Ancel).
- (12) *Manifolds with non-stable fundamental groups at infinity*, Geometry and Topology **4**(2000), 537-579.
- (13) *A non- \mathcal{Z} -compactifiable polyhedron whose product with the Hilbert cube is \mathcal{Z} -compactifiable*, Fund. Math. **168** (2001), 165-197.
- (14) *Manifolds with non-stable fundamental groups at infinity, II*, Geometry and Topology **7**(2003), 255-286 (with F. Tinsley).
- (15) *On the fundamental groups of trees of manifolds*, Pacific J. Math., **221**, No.1(2005), 49-79 (with H. Fischer).
- (16) *Manifolds with non-stable fundamental groups at infinity, III*, Geometry and Topology, **10**(2006) 541-556 (with F. Tinsley).
- (17) *A solution to de Groot's absolute cone conjecture*, Topology, **46**(2007), 89-102.
- (18) *Products of open manifolds with \mathbb{R}* , Fund. Math. **197** (2007), 197-214.

- (19) *An elementary deduction of the Topological Radon Theorem from Borsuk-Ulam*, *Discrete & Computational Geometry*, 43 (2010), no. 4, 951–954.
- (20) *Cell-like equivalences for boundaries of certain $CAT(0)$ groups*, *Geom. Dedicata* 160 (2012), 119–145 (with C.P. Mooney).
- (21) *Topological properties of spaces admitting free group actions*, *J. Topology* 5 (2) (2012), 249–275 (with R. Geoghegan).
- (22) *Spherical alterations of handles: embedding the manifold plus construction*, *Algebr. Geom. Topol.* 13 (2013) 35–60 (with F. Tinsley).
- (23) *On the dimension of \mathcal{Z} -sets*, *Topology and its Appl.* 160 (2013) 1849–1852. (with C. Tirel).
- (24) *Weak Z -structures for some classes of groups*, *Algebr. Geom. Topol.* 14 (2014), no. 2, 1123–1152.
- (25) *Boundaries of Croke–Kleiner-admissible groups and equivariant cell-like equivalence*, *J. Topology* (2014), no. 3, 849–868. (with C.P. Mooney).
- (26) *Ends, shapes and boundaries in manifold topology and geometric group theory*, *Springer Lecture Notes in Math.* volume: *Topology and geometric group theory (Proceedings of the OSU special year 2010-2011)* (to appear), preprint 77 pages.
- (27) *Compacta with shapes of finite complexes: A direct approach to the Edwards-Geoghegan-Wall obstruction* (to appear), preprint 15 pages.

Non-refereed (informal) Publications:

- (1) *A new proof that $\mathcal{N}_3 = 0$* , *Proceedings of the Seventh Annual Western Workshop in Geometric Topology*, Corvallis, Oregon, May 31-June 2, 1990, pp. 30–33. (with F.D. Ancel)
- (2) *Complements of globally 1-alg 2-spheres in 4-manifolds*, *Proceedings of the Ninth Annual Workshop in Geometric Topology*, June 11–13, 1992, Colorado Springs, Colorado, pp. 25–27.
- (3) *Some of Daverman’s wild strongly homogeneous Cantor sets are slippery*, *Proceedings of the Tenth Annual Workshop in Geometric Topology*, Corvallis, Oregon, June 10–12, 1993, pp. 39–42.
- (4) *Homotopic maps to S^1 have homeomorphic mapping swirls, and consequences for pseudo-spines of 4-manifolds*, *Proceedings of the Tenth Annual Workshop in Geometric Topology*, Corvallis, Oregon, June 10–12, 1993, pp. 7–15 (with F.D. Ancel).
- (5) *Covers of aspherical manifolds with geometric fundamental groups*, *Proceedings of the Fourteenth Annual Workshop in Geometric Topology*, Corvallis, Oregon, June 5–7, 1997, pp. 30–32 (with F.D. Ancel).
- (6) *A counterexample to a question by Chapman and Siebenmann*, *Proceedings of the Seventeenth Annual Workshop in Geometric Topology*, Colorado Springs, Colorado, June 15–17, 2000, pp. 57–61.

- (7) *Ends of Manifolds: Recent Progress*, Proceedings of the Eighteenth Annual Workshop in Geometric Topology, Corvallis, Oregon, June 21-23, 2001.
- (8) *On the cell-like equivalences of $CAT(0)$ group boundaries*, Proceedings of the Eighteenth Annual Workshop in Geometric Topology, Corvallis, Oregon, June 21-23, 2001, to appear (with F.D. Ancel and J. Wilson).
- (9) *On homotopy properties of certain Coxeter group boundaries*, Proceedings of the Nineteenth Annual Workshop in Geometric Topology, Grand Rapids, Michigan, June 13-15, 2002, to appear (with H. Fischer).
- (10) *A stabilization theorem for open manifolds*, Proceedings of the 21st Annual Workshop in Geometric Topology, Milwaukee, Wisconsin, June 10-12, 2004, pp. 17-20.
- (11) *Plethora of one-sided cobordisms*, Proceedings of the 21st Annual Workshop in Geometric Topology, Milwaukee, Wisconsin, June 10-12, 2004, pp. 25-28 (with Frederick Tinsley).

Preprints and Writing in Progress:

- (1) *A Comparison of large scale dimension of a metric Space to the dimension of its boundary*, submitted for publication (with M. Moran).
- (2) *Manifolds that are inward tame at infinity*, submitted for publication (with F. Tinsley).
- (3) *Compactifications of manifolds with boundary*, writing in progress.

Instructional Materials:

- (1) *Course Materials for: "Seminar: Introduction to the Language and Practice of Mathematics"*, notes used by Guilbault and others in place of a text for the undergraduate seminar course of the same title (also known as Math 341). Portions of these notes were developed jointly with F.D. Ancel.
- (2) *A Development of the Real and Complex Number Systems*, these notes contain a complete axiomatic development of the real and complex number systems. They have frequently been used in place of a text for Math 529. They also have been used for numerous reading courses. Developed jointly with F.D. Ancel.
- (3) *Algebraic Structures for Elementary Teachers: an activities based course*, notes created for an algebra course for future elementary teachers. Supported by NSF grant: *Milwaukee Mathematics Partnerships: Sharing in Leadership for Student Success*. (EHR-0314898)

Recent Invited Talks

- *The structure and geometry of contractible manifolds*, 30 minute semi-plenary talk, 1995 Annual Spring Topology Conference and Southeast Dynamics Workshop, Newark, DE, April 2, 1995.
- *Ends of manifolds*, 20 minute invited talk, Special Session on Geometric Topology, 915th Meeting of the American Mathematical Society, Chattanooga, TN, October 12, 1996.

- *Synthetic Geometry: curvature without derivatives*, one hour colloquium talk, Department of Mathematics and Computer Science, Loyola University, Chicago, February 21, 1997.
- *\mathcal{Z} -compactifications and boundaries of groups*, one hour talk, Ohio State University Topology Seminar, January 26, 1999.
- *Synthetic differential geometry*, one hour colloquium talk, Department of Mathematics and Computer Science, Marquette University, Milwaukee, WI, February 1999.
- *A non- \mathcal{Z} -compactifiable polyhedron whose product with the Hilbert cube is \mathcal{Z} -compactifiable*, 20 minute invited talk, Special Session on Geometric Topology, 940th Meeting of the American Mathematical Society, Gainesville, Florida, March 12, 1999.
- *Perfect groups in geometric topology*, one hour colloquium talk, Department of Mathematics and Computer Science, Marquette University, Milwaukee, WI, January 31, 2002.
- *An interesting non-pseudocollarable manifold*, 30 minute invited talk, Workshop in Geometric Topology and Geometric Group Theory, University of Florida, Gainesville, FL, March 6, 2002.
- *Perfect groups in geometric topology*, one hour colloquium talk, Department of Mathematical Sciences, Ball State University, Muncie, IN, April 4, 2002.
- *Taming manifolds that are wild at infinity*, one hour invited talk, Special Session in Honor of Robert Daverman at the 19th Annual Workshop in Geometric Topology, June 14, 2002.
- *Manifolds with non-stable fundamental groups at infinity*, 20 minute invited talk, Special Session on Geometric Topology in Honor of John Bryant, 944th Meeting of the American Mathematical Society, Tallahassee, FL, March 13, 2004.
- *Compactifications of finite-dimensional manifolds*, 20 minute invited talk, Special Session on Topological Aspects of Group Theory, AMS Sectional Meeting, Vanderbilt University, Nashville, TN, October 17, 2004.
- *A solution to de Groot's absolute cone conjecture*, 40 minute plenary talk, International Conference and Workshops on Geometric Topology honoring Karol Borsuk's life and work on the 100th anniversary of his birth. Mathematical Research and Conference Center of the Institute of Mathematics of the Polish Academy of Sciences, Bedlewo, Poland. July 3-9, 2005.
- *Exotic behavior near infinity in manifolds*, one hour colloquium talk, Colorado College, October 7, 2005.
- *Metric geometry: curvature without derivatives*, one hour colloquium talk, Calvin College, December 7, 2006.
- *Taming manifolds that are wild at infinity*, one hour seminar talk, Binghamton University, March 1, 2007.
- *Curvature in metric spaces*, one-hour colloquium talk for undergraduates, Bradley University, April 17, 2008.

- *Group Theory and ends of topological manifolds*, One hour colloquium talk, Bradley University, April 18, 2008.
- *End behavior of manifolds and complexes admitting group actions*, one hour seminar talk, Binghamton University, March 17, 2009.
- *A solution to de Groot's absolute cone conjecture*, 50 minute invited talk, Moab Topology Conference, Moab, Utah, May 15, 2009.
- *End behavior of manifolds and complexes admitting group actions*, 45 minute invited talk, Third Texas Southmost Geometry and Topology Conference, hosted by University of Texas at Brownsville, April 16, 2010.
- *Variations on the Borsuk-Ulam theorem: Geometric thinking in high dimensions*, One-hour colloquium talk, Bradley University, October 28, 2010.
- *Topological properties of spaces admitting free \mathbb{Z} -actions*, One-hour seminar talk, University of Michigan, February 4, 2011.
- *Manifolds that are inward tame at infinity*, 20 minute invited talk, Special Session on Geometric Topology, 45th Annual Spring Topology and Dynamics Conference, University of Texas at Tyler, March 17-19, 2011.
- *Ends, shapes, and \mathbb{Z} -compactifications*, four one-hour talks as one of three main speakers, Workshop on Geometrical Methods in High-dimensional Topology, Ohio State University, May 16-21, 2011.
- *Ideas from geometric topology applied to the theory of attractors*, one-hour invited talk, Conference on Topology, Embeddings, and Attractors, hosted by Warwick University; held in Venice, Italy, June 13-17, 2011.
- *End structures and boundaries for open manifolds*, 20 minute invited talk, Special Session on Interactions Between Geometry and Topology, AMS Sectional Meeting, University of Akron, Akron, OH, October 20, 2012.
- *Proof or Swindle? The surprising effectiveness of sketchy technique*, 60 minute colloquium talk, Colorado College, Colorado Springs, CO, December 2012.
- *Weak \mathbb{Z} -structures for some classes of groups*, 20 minute invited talk, Special Session on Geometric Topology, 48th Annual Spring Topology and Dynamics Conference, University of Richmond, March 13-15, 2014.
- *Ends and boundaries of groups*, 50 minute plenary talk, Topological Methods in Group Theory: A conference in honor of Ross Geoghegan's 70th birthday, Ohio State University, June 16-20, 2014.