

## CURRICULUM VITAE

**Name:** Mladen Bestvina

**Address:** Department of Mathematics  
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**Place of Birth:** Osijek, Croatia

**Education:** 1984, Ph.D., Mathematics, University of Tennessee  
1982, B.A., Mathematics, University of Zagreb, Croatia

**Professional Employment:**

Distinguished Professor, Univ. of Utah, 2008-present  
Dean's Distinguished Visiting Professor, University of Toronto, Fall 2018  
Organizer, Geometric Group Theory semester, MSRI Fall 2016  
Professor, Univ. of Utah, 1993-2008  
Organizer, Geometric Group Theory semester, MSRI Fall 2007  
Associate Professor, UCLA, 1989-1993  
Research Fellow, IHES, Winter and Spring 1991  
Assistant Professor, UCLA, 1985-1989  
Research Fellow, Inst. for Advanced Study, Princeton, 1987-88 and Fall 1990  
Visiting Instructor, UC Berkeley, Spring 1985  
Research Fellow, MSRI, Berkeley, Fall 1984  
Hilton-Smith Fellow, University of Tennessee, 1983-84  
Teaching Assistant, University of Tennessee, 1982-83

**Awards and Honors:**

Alfred P. Sloan Fellowship, 1988.  
Presidential Young Investigator Award, 1988.  
Undergraduate Teaching Award, 2006.  
Croatian Academy of Arts and Sciences, Corresponding Member, 2012-  
Fellow of the American Mathematical Society, 2013-  
Mentoring award, University of Utah, 2013  
Visiting Distinguished Professor, KAIST, (2015- )  
Leverhulme Visiting Fellowship at Oxford 2017-18 (declined)  
Simons Fellowship to support sabbatical leave 2017-18  
Dean's Distinguished Visiting Professor, University of Toronto, Fall 2018

**Membership:** American Mathematical Society, 1982-present.

**Research Interests:**

Geometric Topology, Theory of manifolds, Hyperbolic structures  
on 2- and 3- manifolds, and Geometric Group Theory

**Thesis Advisor:** John J. Walsh

**Named Lectures:**

International Congress of Mathematicians, 2022 (Plenary talk)  
Zassenhaus Lectures, The Ohio State University, April 2022

KAIST Distinguished Lecture, Daejeon, Korea, July 2016  
 Potter Lecture, University of Aberdeen, December 2014  
 Current Events invited lecture, Joint Meetings San Diego, January 2013  
 Hahn Lecture Series, Yale University (3 lectures), May 2012  
 Myhill Lecture Series, SUNY Buffalo (3 talks), April 2012  
 AMS Invited Talk, Cornell, September 2011  
 Special Lecture Series (Mallat Family Fund), Technion, Haifa, Israel, June 2010  
 Eleventh Andrzej Jankowski Memorial Lecture, Warsaw, July 2009  
 Namboodiri Lectures, University of Chicago (3 lectures), March-April 2009  
 International Congress of Mathematicians, Beijing, August 2002 (45 minute invited talk)  
 Invited Address, AMS Meeting # 906, Greensboro, NC, November 1995

#### **Selected Invited Talks:**

Minicourse on projection complexes, MSRI summer school, Oxford, July 2022  
 Topology Seminar, Oxford, UK, June 2021  
 Minicourse on rotating families, YGGT, Newcastle, UK, July 2020  
 KAIST Topology Conference, Daejeon, Korea, July 2019  
 Minicourse on projection complexes, KAIST, Daejeon, Korea, July 2019  
 Redbud Topology Conference, University of Oklahoma, April 2019  
 KAIST Topology Conference, Daejeon, Korea, July 2018  
 Arches Topology Conference, Moab, UT, May 2018,  
 Warwick symposium on  $Out(F_n)$ , Warwick, UK, April 2018,  
 Spring topology and dynamics conference, Auburn, March 2018,  
 Topology Seminar, Orsay, France, March 2018  
 Structure of 3-manifold groups, CIRM, Luminy, February 2018  
     plenary talk and workshop for graduate students  
 Berkeley topology seminar, November 2017  
 Vanderbilt topology seminar, October 2017  
 Moduli spaces, Ventotene, Italy, September 2017  
 GAGTA Group theory, Bilbao, Spain, July 2017  
 Groups, manifolds and K-theory, Muenster, Germany, June 2017  
 International Georgia Topology Conference, Athens GA, May 2017  
 Colloquium, Stanford University, October 2016  
 Large scale dimension, Regensburg, Germany, 3 lectures, July 2016  
 Algebraic, Topological and Geometric approaches to  $Aut(F_n)$ , Technion, Haifa, 3 lectures, July 2016  
 MSRI Introductory Workshop, Program in Geometric Group Theory, August 2016  
 KAIST Topology Fair, 2 lectures, Daejeon, Korea, July 2016  
 CUNY Group Theory Seminar, May 2016  
 Geometry of Groups, Montevideo, Uruguay, April 2016  
 Workshop on Tarski Problems, Cambridge, March 2016  
 Groups and Dynamics, Texas A&M, November 2015  
 Cornell Topology Festival, May 2015  
 Rigidity Workshop, Hausdorff Institute, Bonn, April 2015  
 Colloquium, UIUC, April 2015  
 Geometric Groups on the Gulf, two lectures, March 2015  
 Colloquium, University of Toronto, March 2015  
 Colloquium, Arizona State University, March 2015  
 Colloquium, Hebrew University, Jerusalem, December 2014  
 Ahlfors-Bers Colloquium, Yale University, October 2014  
 Yamabe Symposium, University of Minnesota, October 2014  
 Geometry on Groups and Spaces, ICM Satellite Conference, KAIST, Korea, August 2014  
 Hyperbolic Geometry and Geometric Group Theory, Tokyo, July 2014  
 What's next – Mathematical Legacy of Bill Thurston, Cornell, June 2014  
 Asymptotic Geometry of Groups, KU Leuven, Belgium, June 2014

Colloquium, Rice University, April 2014  
 Asymptotic Geometry of Groups, Institute Henri Poincaré, Paris, March 2014  
 Geometry and Groups after Thurston, Dublin, August 2013  
 Summer School in Geometric Group Theory, 3 lectures, Jeonju, South Korea, August 2013  
 Workshop on  $Out(F_n)$ , Marseille, July 2013  
 Chicago Cubes, University of Illinois, Chicago, June 2013  
 Colloquium, Harvard, May 2013  
 Colloquium, Brown, May 2013  
 MSRI Hot Topics Workshop, March 2013  
 Conference on  $Out(F_n)$ , Barcelona, November 2012  
 BUGCAT keynote speaker, conference run by graduate students in topology and algebra, Binghamton, November 2012  
 AIM workshop on Thurston's distance on Teichmüller space, Palo Alto, October 2012  
 Walkshop, conference in the French Alps, 3 lectures, August 2012  
 Conference in group theory, Düsseldorf, July-August 2012  
 Summer school in topology and geometric group theory, minicourse (4 lectures) and a research talk, June 2012  
 Conference in geometric group theory, Kyoto, June 2012  
 PIMS, 2 talks, Vancouver, June 2012  
 Midwest Topology Conference, Bloomington, Indiana (2 talks), April 2012  
 Workshop on Dynamics and Laminations, Luminy, April 2012  
 Texas Geometry Conference, Austin (2 talks), October 2011  
 Conference on Teichmüller theory, Dublin, September 2011  
 Colloquium, Brigham Young University, September 2011  
 Geometric Group Theory Conference, Technion, Haifa, Israel, June 2011  
 Mapping Class Groups and  $Out(F_n)$ , Ohio State, May 2011  
 Colloquium, University of Nevada, Reno, April 2011  
 AIM Workshop on Outer space, Palo Alto, October 2010  
 ICM Satellite Conference on Non-positive curvature, Bangalore, India, August 2010  
 Geometric Group Theory workshop (3 lecture course on Outer space), Goa, India, August 2010  
 Vogtmannfest, conference in honor of Karen Vogtmann, Luminy, France, June 2010  
 Colloquium, Hebrew University, Jerusalem, Israel, June 2010  
 Third Texas Southmost Geometry and Topology Conference, South Padre Island, TX April 2010  
 Colloquium, University of Michigan, April 2010  
 Geometric group theory, Oberwolfach, April 2010  
 Minicourse on Outer space, University of Michigan, April 2009  
 Conference in honor of Steve Ferry, Chicago, March 2009  
 Spring Topology Conference, Gainesville, FL March 2009  
 4th Croatian Congress of Mathematicians, Osijek, June 2008  
 JAMI Conference 2008, Johns Hopkins University, May 2008  
 MSRI-Evans seminar, Berkeley, November 2007  
 Thurston's 60th Birthday Conference, Princeton, June 2007  
 Geometry and Dynamics in surfaces and 3-manifolds, Brown University, May 2007  
 Asymptotic Properties of Groups, Texas A&M, November 2005  
 Geometric Topology, in honor of Henryk Toruńczyk's 60th birthday, Poland, July 2005  
 Geometric group theory, Barcelona, June 2005  
 Asymptotic properties of groups, Geneva, June 2005  
 Boundaries of groups workshop, AIM, Palo Alto, June 2005  
 Knots and 3-manifolds, in honor of Cameron Gordon's 60th birthday, Austin, May 2005  
 Southern California Topology Seminar, Caltech, April 2005  
 Geometry of groups and K-theory, Honolulu, January 2005  
 AMS Special Session in geometric group theory, Nashville, October 2004  
 Homological methods in group theory, Durham, England, July 2003

Geometric Topology, A Satellite Conference to ICM, Xian, China, August 2002  
 International Georgia Topology Conference, Athens, GA, May 2001  
 Topological methods in group theory, Oberwolfach, January 2001  
 Geometric Group Theory, Technion, Israel, June 2000  
 Conference in honor of Larry Siebenmann and Valentin Poenaru, Orsay, June 1999  
 Conference in honor of Rips' 50th birthday, Hebrew University, December 1998  
 The Zabrodsky Lecture, Hebrew University, December 1998  
 Spring Topology Conference, Invited Address, George Mason University, March 1998  
 London-Sussex-Southampton Topology Seminar, July 1997  
 Workshop on real trees, CRM, Montreal, October 1996  
 Invited Address, 1<sup>st</sup> Congress of the Croatian Mathematical Society, Zagreb, July 1996  
 Conference in honor of Wu-Chung Hsiang, Princeton, October 1995  
 Spring Topology Conference, Invited Address, University of Delaware, April 1995  
 ICM Satellite meeting on low dimensional topology, Lyon, July 1994

#### **Service:**

Selection Committee for ICBS Frontiers of Science Award,  
 Algebraic and Geometric Topology, 2023, 2024  
 AIM Scientific Board, 2005-2022  
 NSF Postdoctoral Panel, AMS representative, 2001-2004  
 NSF Panel, Algebraic Topology and Geometric Group Theory, several times  
 Selection Committee for Speakers in the Topology Session, Madrid ICM 2006  
 Selection Committee for plenary speakers at a joint AMS meeting in Warsaw 2007  
 2014 Current Events Bulletin Committee  
 Scientific Committees for various geometric group theory conferences

#### **Editorial Boards:**

Peking Journal of Mathematics, (2023- )  
 Geometry and Topology, (2019- )  
 Duke Math. J., (2015- )  
 Publicacions Matemàtiques, (2015- )  
 Rocky Mountain Journal of Mathematics, (2009-2015)  
 Journal of Topology and Analysis, (2008- )  
 GAFA, (2007- )  
 Annals of Mathematics, Associate Editor (2006-2013)  
 Groups, Geometry, and Dynamics (2006- )  
 Transactions of the AMS and Memoirs of the AMS (editor for geometric topology 2003-2008 )  
 Michigan Math. J. (2008-)  
 Glasnik Matematički (journal of the Croatian Mathematical Society)  
 Mathematical Communications (journal of the Croatian Mathematical Society)  
 Proceedings of the Edinburgh Mathematical Society (Consulting Editor 2004-2011)

#### **Conferences Organized:**

PIMS special session in geometric group theory, with Koji Fujiwara and Rita Jimenez-Rolland, Vancouver  
 JMM special session in geometric group theory, with Dan Margalit and Carolyn Abbott, Jan 2022  
 Dubrovnik Topology and Dynamics Conference, Dubrovnik, Croatia, June 2019  
 Warwick Workshop "Geometry of Teichmüller space and mapping class groups", April 2018  
 (coorganizers: Tara Brendle, Christopher Leininger)  
 Newton Institute Workshop "Non-positive curvature, group actions and cohomology", Cambridge, June 2018  
 (coorganizers: Brian Bowditch, Alessandra Iozzi, Nicolas Monod)  
 MSRI Jumbo program, Geometric Group Theory, Fall 2016  
 (coorganizers: Ian Agol, Cornelia Druţu, Mark Feighn, Michah Sageev, Karen Vogtmann)  
 ICERM workshop, Effective and Algorithmic Methods in Hyperbolic Geometry and Free Groups,

May 2016 (coorganizers: Tarik Aougab, Jeffrey Brock, Eriko Hironaka, Johanna Mangahas)  
Geometric Topology, Geometric group theory and dynamics, Dubrovnik, June 2015  
PCMI Program in Geometric Group Theory (with M. Sageev and K. Vogtmann), July 2012  
Dubrovnik Topology Conference, Croatia, June 2011  
Clay Institute workshop on Outer space, October 2009  
MSRI special semester in geometric group theory, Fall 2007  
AIM meeting on open problems in geometric group theory, April 2007  
Semi-annual Wasatch Topology Conference, 1995-present  
Spring Topology Conference, University of Utah 1999  
Various Scientific Organizing Committees

**Outreach:**

Presentation at SACNAS (organization devoted to advancing Hispanics,  
Chicanos and Native Americans in Science), San Jose, CA, October 2011  
Summer Program for high school students, Univ of Utah, Summer 2007

**PhD Students:**

Tad White (1991)  
Sean Cleary (1992)  
Warwick Daw (1992)  
Reiner Martin (1995)  
Nataša Macura (1998)  
Sung Yil Yoon (2002)  
Emina Alibegović (2003)  
Zrinka Despotovich (2006)  
Matt Clay (2006)  
Lars Louder (2007)  
Yael Algom Kfir (2010)  
William Malone (2010)  
Erika Meucci (2011)  
Brian Mann (2014)  
Sonya Leibman (2014)  
Radhika Gupta (2017)  
Derrick Wigglesworth (2018)  
Dawei (David) Wang (2019)  
George Domat (2022)  
Ryan Dickmann (2022)  
Sanghoon Kwak (2024, joint with Priyam Patel)  
Michael Kopreski (current)  
George Shaji (current)

**Other:**

External Examiner, PhD thesis, Alessandro Sisto, Oxford, 2013  
External Examiner, PhD thesis, Richard Webb, Warwick, 2014  
REU project on Coxeter groups with Kouver Bingham, 2014  
External Examiner, PhD thesis, Camille Horbez, Rennes, 2014  
Mentored Brian Udall and supervised Honors Thesis, Brian accepted  
in graduate school at Rice University, 2021

**Some activities in the last 3 years:**

Published 6 papers, including in *Ann. Sci. Éc. Norm. Supér.*  
Posted 7 preprints on the arxiv, 4 of these are accepted for publication  
Graduated 2 PhD students (George Domat and Ryan Dickmann)  
Mentoring 3 graduate students, one (joint with Priyam Patel) is finishing in spring 2024  
Comentoring (with Priyam Patel) two postdocs (Elizabeth Field and Alex Rasmussen),  
both received NSF postdoctoral fellowships.  
Continuing editorial work in several journals, including *GAFA*, *Duke*,  
*Geometry and Topology*, *Groups Geometry and Dynamics*.  
Several departmental committees,  
College of Science RPT committee 2021-2025 (Chair 2023-24)  
Putnam exam coordinator, including running Math 5000  
Given Zassenhaus Lectures at Ohio State 2022.  
Given plenary talk at ICM 2022.

**Grant support:**

Continuously supported by the NSF since 1985. Current grant DMS-2304774.

## List of Preprints - Mladen Bestvina

- [1] Mladen Bestvina, Federica Fanoni, and Jing Tao. Towards Nielsen-Thurston classification for surfaces of infinite type. arXiv:2303.12413, 2023.
- [2] Mladen Bestvina, Martin R. Bridson, and Richard D. Wade. On the geometry of the free factor graph for  $Aut(F_N)$ . arXiv:2312.03535, 2023.
- [3] Mladen Bestvina and Martin R. Bridson. Rigidity of the free factor complex. arXiv:2306.05941, 2023.
- [4] Mladen Bestvina and Alexander J. Rasmussen. Transverse measures to infinite type laminations. arXiv:2209.00164, 2022.
- [5] Mladen Bestvina, Radhika Gupta, and Jing Tao. Limit sets of unfolding paths in Outer space. arXiv:2207.06992, 2022.
- [6] Mladen Bestvina, Jonathan Chaika, and Sebastian Hensel. Connectivity of the Gromov boundary of the free factor complex. arXiv:2105.01537, 2021.
- [7] Yael Algom-Kfir and Mladen Bestvina. Groups of proper homotopy equivalences of graphs and Nielsen Realization. arXiv:2109.06908, 2021.
- [8] Mladen Bestvina and Mark Feighn. Definable and negligible subsets of free groups, I. preprint.

## List of Publications - Mladen Bestvina

- [1] Mladen Bestvina. Groups acting on hyperbolic spaces—a survey. In *ICM—International Congress of Mathematicians. Vol. II. Plenary lectures*, pages 678–711. EMS Press, Berlin, [2023] ©2023.
- [2] Mladen Bestvina, Koji Fujiwara, and Derrick Wigglesworth. The Farrell-Jones conjecture for hyperbolic-by-cyclic groups. *Int. Math. Res. Not. IMRN*, (7):5887–5904, 2023.
- [3] Mladen Bestvina, Mark Feighn, and Michael Handel. A McCool Whitehead type theorem for finitely generated subgroups of  $Out(F_n)$ . *Ann. H. Lebesgue*, 6:65–94, 2023.
- [4] Mladen Bestvina, Ryan Dickmann, George Domat, Sanghoon Kwak, Priyam Patel, and Emily Stark. Free products from spinning and rotating families. *Enseign. Math.*, 69(3-4):235–260, 2023.
- [5] Mladen Bestvina, Vincent Guirardel, and Camille Horbez. Boundary amenability of  $Out(F_N)$ . *Ann. Sci. Éc. Norm. Supér. (4)*, 55(5):1379–1431, 2022.
- [6] Mladen Bestvina, Ken Bromberg, and Koji Fujiwara. Proper actions on finite products of quasi-trees. *Ann. H. Lebesgue*, 4:685–709, 2021.
- [7] Mladen Bestvina and Gordan Savin. Bounded contractions for affine buildings. *Proc. Amer. Math. Soc.*, 148(2):875–883, 2020.
- [8] Mladen Bestvina, Camille Horbez, and Richard D. Wade. On the topological dimension of the Gromov boundaries of some hyperbolic  $Out(F_N)$ -graphs. *Pacific J. Math.*, 308(1):1–40, 2020.
- [9] Mladen Bestvina, Kenneth Bromberg, Autumn E. Kent, and Christopher J. Leininger. Undistorted purely pseudo-Anosov groups. *J. Reine Angew. Math.*, 760:213–227, 2020.
- [10] Mladen Bestvina, Kenneth Bromberg, Koji Fujiwara, and Alessandro Sisto. Acylindrical actions on projection complexes. *Enseign. Math.*, 65(1-2):1–32, 2020.
- [11] Mladen Bestvina and Camille Horbez. A compactification of outer space which is an absolute retract. *Ann. Inst. Fourier (Grenoble)*, 69(6):2395–2437, 2019.
- [12] Mladen Bestvina, Kenneth Bromberg, and Koji Fujiwara. The verbal width of acylindrically hyperbolic groups. *Algebr. Geom. Topol.*, 19(1):477–489, 2019.
- [13] Mladen Bestvina and Ken Bromberg. On the asymptotic dimension of the curve complex. *Geom. Topol.*, 23(5):2227–2276, 2019.



- [14] Arthur Bartels and Mladen Bestvina. The Farrell-Jones conjecture for mapping class groups. *Invent. Math.*, 215(2):651–712, 2019.
- [15] Mladen Bestvina, Sasha Dranishnikov, Steve Ferry, and Šime Ungar. Sibe Mardešić: In memoriam. *Topology Appl.*, 240:A1–A2, 2018.
- [16] Mladen Bestvina and Koji Fujiwara. Handlebody subgroups in a mapping class group. In *In the tradition of Ahlfors-Bers. VII*, volume 696 of *Contemp. Math.*, pages 29–50. Amer. Math. Soc., Providence, RI, 2017.
- [17] Mladen Bestvina. Homological stability of  $Aut(F_n)$  revisited. In *Hyperbolic geometry and geometric group theory*, volume 73 of *Adv. Stud. Pure Math.*, pages 1–11. Math. Soc. Japan, Tokyo, 2017.
- [18] Mladen Bestvina, Bruce Kleiner, and Michah Sageev. Quasiflats in  $CAT(0)$  2-complexes. *Algebr. Geom. Topol.*, 16(5):2663–2676, 2016.
- [19] Mladen Bestvina, Ken Bromberg, and Koji Fujiwara. Stable commutator length on mapping class groups. *Ann. Inst. Fourier (Grenoble)*, 66(3):871–898, 2016.
- [20] Mladen Bestvina, Ken Bromberg, and Koji Fujiwara. Bounded cohomology with coefficients in uniformly convex Banach spaces. *Comment. Math. Helv.*, 91(2):203–218, 2016.
- [21] Mladen Bestvina and Patrick Reynolds. The boundary of the complex of free factors. *Duke Math. J.*, 164(11):2213–2251, 2015.
- [22] Mladen Bestvina, Ken Bromberg, and Koji Fujiwara. Constructing group actions on quasi-trees and applications to mapping class groups. *Publ. Math. Inst. Hautes Études Sci.*, 122:1–64, 2015.
- [23] Mladen Bestvina and Mark Feighn. Subfactor projections. *J. Topol.*, 7(3):771–804, 2014.
- [24] Mladen Bestvina and Mark Feighn. Hyperbolicity of the complex of free factors. *Adv. Math.*, 256:104–155, 2014.
- [25] Mladen Bestvina. Section on geometric group theory in the gromov chapter. In Helge Holden and Ragni Piene, editors, *The Abel Prize 2008–2012*. Springer Verlag, Heidelberg, 2014.
- [26] Mladen Bestvina. Geometry of outer space. In *Geometric group theory*, volume 21 of *IAS/Park City Math. Ser.*, pages 173–206. Amer. Math. Soc., Providence, RI, 2014.
- [27] Mladen Bestvina. Geometric group theory and 3-manifolds hand in hand: the fulfillment of Thurston’s vision. *Bull. Amer. Math. Soc. (N.S.)*, 51(1):53–70, 2014.
- [28] Mladen Bestvina. *A primer on mapping class groups* [book review of MR2850125]. *Bull. Amer. Math. Soc. (N.S.)*, 51(4):691–700, 2014.
- [29] Mladen Bestvina, Thomas Church, and Juan Souto. Some groups of mapping classes not realized by diffeomorphisms. *Comment. Math. Helv.*, 88(1):205–220, 2013.
- [30] M. Bestvina, K. Bromberg, K. Fujiwara, and J. Souto. Shearing coordinates and convexity of length functions on Teichmüller space. *Amer. J. Math.*, 135(6):1449–1476, 2013.

- [31] Mladen Bestvina and Gordan Savin. Geometry of integral binary Hermitian forms. *J. Algebra*, 360:1–20, 2012.
- [32] Yael Algom-Kfir and Mladen Bestvina. Asymmetry of Outer space. *Geom. Dedicata*, 156:81–92, 2012.
- [33] Mladen Bestvina. A Bers-like proof of the existence of train tracks for free group automorphisms. *Fund. Math.*, 214(1):1–12, 2011.
- [34] Mladen Bestvina and Mark Feighn. A hyperbolic  $\text{Out}(F_n)$ -complex. *Groups Geom. Dyn.*, 4(1):31–58, 2010.
- [35] Mladen Bestvina, Kai-Uwe Bux, and Dan Margalit. The dimension of the Torelli group. *J. Amer. Math. Soc.*, 23(1):61–105, 2010.
- [36] Jason Behrstock, Mladen Bestvina, and Matt Clay. Growth of intersection numbers for free group automorphisms. *J. Topol.*, 3(2):280–310, 2010.
- [37] Mladen Bestvina and Koji Fujiwara. A characterization of higher rank symmetric spaces via bounded cohomology. *Geom. Funct. Anal.*, 19(1):11–40, 2009.
- [38] Mladen Bestvina and Mark Feighn. Notes on Sela’s work: limit groups and Makanin-Razborov diagrams. In *Geometric and cohomological methods in group theory*, volume 358 of *London Math. Soc. Lecture Note Ser.*, pages 1–29. Cambridge Univ. Press, Cambridge, 2009.
- [39] Mladen Bestvina, Bruce Kleiner, and Michah Sageev. The asymptotic geometry of right-angled Artin groups. I. *Geom. Topol.*, 12(3):1653–1699, 2008.
- [40] Mladen Bestvina. PL Morse theory. *Math. Commun.*, 13(2):149–162, 2008.
- [41] Mladen Bestvina and Koji Fujiwara. Quasi-homomorphisms on mapping class groups. *Glas. Mat. Ser. III*, 42(62)(1):213–236, 2007.
- [42] Mladen Bestvina, Kai-Uwe Bux, and Dan Margalit. Dimension of the Torelli group for  $\text{Out}(F_n)$ . *Invent. Math.*, 170(1):1–32, 2007.
- [43] Mladen Bestvina. Four questions about mapping class groups. In *Problems on mapping class groups and related topics*, volume 74 of *Proc. Sympos. Pure Math.*, pages 3–9. Amer. Math. Soc., Providence, RI, 2006.
- [44] Emina Alibegović and Mladen Bestvina. Limit groups are  $\text{CAT}(0)$ . *J. London Math. Soc. (2)*, 74(1):259–272, 2006.
- [45] Mladen Bestvina, Mark Feighn, and Michael Handel. The Tits alternative for  $\text{Out}(F_n)$ . II. A Kolchin type theorem. *Ann. of Math. (2)*, 161(1):1–59, 2005.
- [46] M. Bestvina and M. Feighn. Counting maps from a surface to a graph. *Geom. Funct. Anal.*, 15(5):939–961, 2005.
- [47] Mladen Bestvina, Mark Feighn, and Michael Handel. Solvable subgroups of  $\text{Out}(F_n)$  are virtually Abelian. *Geom. Dedicata*, 104:71–96, 2004.

- [48] Mladen Bestvina, Michael Kapovich, and Bruce Kleiner. Van Kampen’s embedding obstruction for discrete groups. *Invent. Math.*, 150(2):219–235, 2002.
- [49] Mladen Bestvina and Koji Fujiwara. Bounded cohomology of subgroups of mapping class groups. *Geom. Topol.*, 6:69–89 (electronic), 2002.
- [50] Mladen Bestvina and Mark Feighn. Proper actions of lattices on contractible manifolds. *Invent. Math.*, 150(2):237–256, 2002.
- [51] Mladen Bestvina. The topology of  $\text{Out}(F_n)$ . In *Proceedings of the International Congress of Mathematicians, Vol. II (Beijing, 2002)*, pages 373–384, Beijing, 2002. Higher Ed. Press.
- [52] Mladen Bestvina.  $\mathbb{R}$ -trees in topology, geometry, and group theory. In *Handbook of geometric topology*, pages 55–91. North-Holland, Amsterdam, 2002.
- [53] Mladen Bestvina, Robert J. Daverman, Gerard A. Venema, and John J. Walsh. A 4-dimensional 1-LCC shrinking theorem. *Top. Appl.*, 110:3–20, 2001.
- [54] Mladen Bestvina, Mark Feighn, and Michael Handel. The Tits alternative for  $\text{out}(F_n)$ . I. Dynamics of exponentially-growing automorphisms. *Ann. of Math. (2)*, 151(2):517–623, 2000.
- [55] Mladen Bestvina and Mark Feighn. The topology at infinity of  $\text{out}(F_n)$ . *Invent. Math.*, 140(3):651–692, 2000.
- [56] Mladen Bestvina. Non-positively curved aspects of Artin groups of finite type. *Geom. Topol.*, 3:269–302 (electronic), 1999.
- [57] Mladen Bestvina and Noel Brady. Morse theory and finiteness properties of groups. *Invent. Math.*, 129(3):445–470, 1997.
- [58] M. Bestvina, M. Feighn, and M. Handel. Laminations, trees, and irreducible automorphisms of free groups. *Geom. Funct. Anal.*, 7(2):215–244, 1997.
- [59] M. Bestvina, M. Feighn, and M. Handel. Erratum to: “Laminations, trees, and irreducible automorphisms of free groups” [*Geom. Funct. Anal.* **7** (1997), no. 2, 215–244; MR 98c:20045]. *Geom. Funct. Anal.*, 7(6):1143, 1997.
- [60] Mladen Bestvina and Mark Feighn. Addendum and correction to: “A combination theorem for negatively curved groups” [*J. Differential Geom.* **35** (1992), no. 1, 85–101; MR 93d:53053]. *J. Differential Geom.*, 43(4):783–788, 1996.
- [61] Mladen Bestvina. Local homology properties of boundaries of groups. *Michigan Math. J.*, 43(1):123–139, 1996.
- [62] Mladen Bestvina and Mark Feighn. Stable actions of groups on real trees. *Invent. Math.*, 121(2):287–321, 1995.
- [63] M. Bestvina and M. Handel. Train-tracks for surface homeomorphisms. *Topology*, 34(1):109–140, 1995.
- [64] Mladen Bestvina. The virtual cohomological dimension of Coxeter groups. In *Geometric group theory, Vol. 1 (Sussex, 1991)*, pages 19–23. Cambridge Univ. Press, Cambridge, 1993.

- [65] Mladen Bestvina and Michael Handel. Train tracks and automorphisms of free groups. *Ann. of Math. (2)*, 135(1):1–51, 1992.
- [66] Mladen Bestvina and Michael Handel. An area preserving homeomorphism of  $T^2$  that is fixed point free but does not move any essential simple closed curve off itself. *Ergodic Theory Dynamical Systems*, 12(4):673–676, 1992.
- [67] M. Bestvina and M. Feighn. A combination theorem for negatively curved groups. *J. Differential Geom.*, 35(1):85–101, 1992.
- [68] Mladen Bestvina and Geoffrey Mess. The boundary of negatively curved groups. *J. Amer. Math. Soc.*, 4(3):469–481, 1991.
- [69] Mladen Bestvina and Mark Feighn. A counterexample to generalized accessibility. In *Arboreal group theory (Berkeley, CA, 1988)*, pages 133–141. Springer, New York, 1991.
- [70] Mladen Bestvina and Mark Feighn. Bounding the complexity of simplicial group actions on trees. *Invent. Math.*, 103(3):449–469, 1991.
- [71] Mladen Bestvina. Degenerations of the hyperbolic space. *Duke Math. J.*, 56(1):143–161, 1988.
- [72] Mladen Bestvina. Characterizing  $k$ -dimensional universal Menger compacta. *Mem. Amer. Math. Soc.*, 71(380):vi+110, 1988.
- [73] Mladen Bestvina. Stabilizing fake Hilbert spaces. *Topology Appl.*, 26(3):293–305, 1987.
- [74] M. Bestvina and D. Cooper. A wild Cantor set as the limit set of a conformal group action on  $S^3$ . *Proc. Amer. Math. Soc.*, 99(4):623–626, 1987.
- [75] Mladen Bestvina and Jerzy Mogilski. Characterizing certain incomplete infinite-dimensional absolute retracts. *Michigan Math. J.*, 33(3):291–313, 1986.
- [76] Mladen Bestvina, Philip Bowers, Jerzy Mogilski, and John Walsh. Characterization of Hilbert space manifolds revisited. *Topology Appl.*, 24(1-3):53–69, 1986. Special volume in honor of R. H. Bing (1914–1986).
- [77] Mladen Bestvina and Jerzy Mogilski. Linear maps do not preserve countable dimensionality. *Proc. Amer. Math. Soc.*, 93(4):661–666, 1985.
- [78] Mladen Bestvina. Essential dimension lowering mappings having dense deficiency set. *Trans. Amer. Math. Soc.*, 287(2):787–798, 1985.
- [79] M. Bestvina and Z. Čerin. On properties preserved by the  $q$ -convergence on hyperspaces. In *Topology, theory and applications (Eger, 1983)*, pages 71–87. North-Holland, Amsterdam, 1985.
- [80] Mladen Bestvina and John J. Walsh. Mappings between Euclidean spaces that are one-to-one over the image of a dense subset. *Proc. Amer. Math. Soc.*, 91(3):449–455, 1984.
- [81] Mladen Bestvina. Characterizing  $k$ -dimensional universal Menger compacta. *Bull. Amer. Math. Soc. (N.S.)*, 11(2):369–370, 1984.