

# CURRICULUM VITAE

Michael Wolf

## Education

Stanford University, Ph.D., 1986  
Yale University, B.S. (Mathematics, Philosophy), 1981

## Areas of Research

Teichmüller Theory, Harmonic Maps, Minimal Surfaces, Global Differential Geometry

## Fellowships and Honors

2019-20 Simons Foundation Fellow in Mathematics  
2019 Marjorie Corcoran (Rice Univ.) Award for contributions to the advancement of Women and Under-represented Minorities in STEM  
2013 Fellow of the American Mathematical Society (Inaugural Class)  
2013 George R. Brown Award for Superior Teaching (Rice Campus-wide teaching prize)  
1991-95 Alfred P. Sloan Research Fellow  
1987-91 NSF Mathematical Sciences Postdoctoral Research Fellow  
1985-86 Alfred P. Sloan Doctoral Dissertation Fellow

## Professional Appointments

Fall, 2019 Research Professor, MSRI  
2017-18 Chair, Department of Mathematics, Rice University  
2012- Founder and Director, Rice Emerging Scholars Program  
2006-11 Residential College Master, Rice University  
2005-09 Chair, Department of Mathematics, Rice University  
Spring, 2015 Member, MSRI  
March, 2013 Invited Professor, Tsinghua University (Beijing)  
Fall, 2007 Member, MSRI  
2005 Invited Professor, Université de Tours  
1999- Professor, Rice University  
1995 Member, Max Planck Institut  
June, 1995 Member, MSRI  
1993-4 Research Professor, MSRI  
1993-99 Associate Professor, Rice University  
1988-93 Assistant Professor, Rice University  
1986-88 C.L.E. Moore Instructor, M.I.T.

## Editorial Positions

|         |   |
|---------|---|
| 2010-18 | Editorial Board (Geometric Analysis), <i>Proc. Amer. Math. Soc.</i> |
| 2014-18 | —Coordinating Editor, Geometry and Topology                         |
| 2002-18 | Editorial Board, <i>Bull. Amer. Math. Soc.</i>                      |
| 2001-   | Associate Editor, <i>J. Geom. Anal.</i>                             |
| 2002-3  | Associate Editor, <i>Walter Rudin Book Series, McGraw-Hill</i>      |

## Advisory Positions

|         |  |
|---------|--|
| 2019    | External Review Committee, Brandeis Math. Dept.                          |
| 2018    | Participant, RTG PIs Meeting   |
| 2015    | Participant, Nat. Acad. of Sci. Panel: Undergraduate Research            |
| 2004-   | NSF Panels: 2004, 2006, 2007, 2012, 2013, 2017, 2018 ( $\times 2$ )      |
| 2007    | NSF Workshop: Educating Math. Sci. Workforce in 21 <sup>st</sup> Century |
| 2014-17 | Amer. Math. Soc. Committee on National Speakers (for Joint Meetings)     |

## Students

|             |                           |
|-------------|---------------------------|
| 1991        | George Stockton, M.A.     |
| 1998        | Nancy Cunningham, Ph.D.   |
| 1999        | Lorette Stone, Ph.D.      |
| 2003        | Robert Huff, Ph.D.        |
| 2003        | Zheng Huang, Ph.D.        |
| 2007        | Soomin Kim, Ph.D.         |
| 2009        | Casey Douglas, Ph.D.      |
| 2009        | Matthew McClelland, Ph.D. |
| 2012        | Evelyn Lamb, Ph.D.        |
| 2012        | Renee Laverdiere Ph.D.    |
| 2014        | Qiongling Li Ph.D.        |
| 2016        | Andrew Huang Ph.D.        |
| 2016        | Jorge Acosta Ph.D.        |
| progressing | Xian Dai, Charles Ouyang  |

## Some Significant University Service

|          |   |
|----------|---|
| 2012-    | co-Founder and co-Director, Rice Emerging Scholars Program                              |
| 2006-11  | Residential College Master, Will Rice College   |
| 2009-10  | First Residential College Master, McMurtry College                                      |
| 2009-10  | Faculty Committee on the Rice Merger with Baylor College of Medicine                    |
| 2017     | Writing Group on the Access, Diversity and Inclusion Plank of University Strategic Plan |
| 2013-16, | Member, Faculty Senate (Parliamentarian, 2017-19)                                       |
| 2017-19  |   |
| 2018     | <i>ad hoc</i> Appeals Committee Member  |
| 2014-15  | Chair, (Two) Faculty Senate Working Groups on the Academic Calendar                     |

## Professional Activities

|                              |   |
|------------------------------|---|
| 2021                         | Scientific Committee, Labourie Sixtieth, Nice.  |
| 2018                         | Co-Organizer, Oaxaca conference on Higgs Bundles and Harmonic Maps  |
| 2017                         | Scientific Committee, GEAR Retreat  |
| 2014                         | Scientific Committee, Intensive Period on Teichmüller Theory and 3-Manifolds, Pisa  |
| 2012                         | Co-Organizer, KerckhoffFest, Luminy   |
| 2008-15                      | Co-I, Rice VIGRE Program  |
| 2005-9                       | PI, Rice VIGRE Program  |
| 2010                         | Co-Organizer, WolpertFest, Univ. Maryland   |
| 2008-11                      | Chair, Organizing Board, Ahlfors-Bers Colloquium  |
| 2001-8                       | Organizing Board, Ahlfors-Bers Colloquium   |
| 2007-09                      | Sigma Xi National Distinguished Lecturer  |
| '90, '96, '97, '00, '15, '18 | Co-Organizer, Texas Geometry and Topology Conference, Houston, TX   |
| 2005                         | Co-Organizer, Harvey-Polking Fest, Rice University  |
| 2005                         | Co-Organizer, AIM Conference on Global Theory of Minimal Surfaces   |
| 2004                         | Co-Organizer, IId IberoAmerican Congress on Geometry, Salamanca, Spain  |
| 2004                         | Co-Organizer, AMS Special Session on Geometric Variational Problems, Houston, TX,   |
| 2002                         | Co-Organizer, AMS Special Session on Flat Structures, Moduli Spaces and Minimal Surfaces, Portland Oregon                 |
| 2001                         | Co-Organizer, Clay Mathematics Institute Summer School on the Global Theory of Minimal Surfaces, Berkeley, CA             |
| 2001                         | Co-Organizer, IInd Iberoamerican Congress on Geometry, Guanajuato, Mexico,  |
| 1996                         | Co-Organizer, Undergraduate Conference on the Calculus of Variations, Houston, TX,  |
| 1992                         | Co-Organizer, Regional Geometry Institute Summer School and Research Program in Geometry and Nonlinear PDE, Park City, UT |
| 1991                         | Invited Participant, National Academy of Sciences' Symposium on Frontiers of Science                                      |

## Principal Talks

- 2019 Simons Center Wkshp on Holomorphic Diffs.; Stonybrook; Boston College; Texas State
- 2018 Uni-Luxembourg, University of Virginia, Bolivian Congreso de Math.
- 2017 South. Calif Geom. Anal. Sem. (UCSD), Caltech, Oberwolfach, Maryland Atelier on Geom. Anal., USC, Tata Inst. Conf. on Geom. Structures, Bangalore (3 talks)
- 2016 Conf. on Holomorphic Differentials, African Inst. of Math. Sci. (Cape Town), Pavia (Italy), IWH conference on Higgs bundles (Heidelberg), NUS-IMS Conference on Geom. Structures (Singapore)
- 2015 UC Davis, UC Berkeley, UCSanta Cruz, Pavia (Italy), Newton Institute (Cambridge, England), Conference on Higher Teichmüller theory (Heidelberg)
- 2014 Paris-Sud (Orsay), GEAR Retreat (Maryland), Northwestern, Tsinghua-Sanya Group Action Forum
- 2013 Maryland, Tsinghua University (Beijing) [mini-course], Beijing University, Yale, Conference on Variational Problems and PDE (Granada), Park City Math. Institute, Conference on Higher Teichmüller theory (Aarhus), ICERM Conference on Geometric Structures
- 2012 AMS Special Session, Boston, MA; Univ. Chicago, Symposium on Minimal Surfaces, New York, NY; CUNY; Stanford; CRM conference on Higher Teichmüller-Thurston theory (Montreal)
- 2011 Oberwolfach, Rutgers, UTPan-American
- 2010 Univ. of Houston; Conference on Geometry, Topology and Dynamics of Character Varieties, Singapore; Univ. of Ill., Chicago; Conference on Geometric Structures in Dimensions 2 and 3, Autrans, France
- 2009 CBMS Conference on Weil-Petersson Geometry, CCSU (Connecticut), 2009; Tulane University; Murray State University (Sigma Xi)
- 2008 Southeast Geometry Seminar, Georgia Tech.; Pacific Northwest Geometry Seminar, Stanford ; Portland State Univ
- 2007 KIAS conference on Geometric Analysis, Seoul; Brown; Introductory Workshop on Teichmüller Theory, Ann Arbor
- 2006 Canaryfest, Ann Arbor MI; Notre Dame; Chinese Acad. of Sci. School of Math. Sci ; Intl. Conf. on Discrete Groups, Beijing; Intl. Conference on Teichmüller Theory and Vector Bundles, Allahabad, India
- 2005 University of Georgia; AIM Conference on Moduli Spaces of Minimal Surfaces; Université de Tours (3 talks), France; Princeton; Wesleyan University (CT)
- 2004 Summer School on Minimal Surfaces, Paris; (3 lectures); Pacific Northwest Geometry Seminar, Salt Lake City, Utah
- 2003 Miniconference on Teichmüller Theory, Chicago; University of Oklahoma Karcher Colloquium, Oklahoma; Newton Institute (Klein. Gps. Wkshp.), Cambridge, England; AMS-RSME Special Session, Seville, Spain; Granada, Spain; AMS Special Session, Indiana; Southern California Geometric Analysis Seminar, UCSD
- 2002 Invited Address, AMS Western Sectional Meeting, Portland; California Institute of Technology; XII Escola de Geometria Diferencial, Goiania, Brazil; AMS Special Session, Ann Arbor,
- 2001 Clay Institute Summer School on Minimal Surfaces (3 talks); University of Chicago; SUNY-Stonybrook; Rutgers; IInd Iberoamerican Congress on Geometry, Guanajuato, Mexico
- 2000 Texas A&M University; University of Minnesota; Universität Bonn; Amherst College; Valley Geometry Seminar, UMass

## Principal Talks, cont.

- 1999 | Midrasha Mathematics, Hebrew University, Jerusalem; Bar-Ilan University, Tel Aviv; Indiana University
- 1998 | MSRI-Stanford; Purdue University; University of Michigan; Chinese University of Hong Kong; University of Chicago; University of Illinois (Chicago); Washington University of St. Louis (Roever Colloquium); University of Houston
- 1997 | SMM Special Session on Complex and Functional Analysis, (Panoramic Talk) Oaxaca; Ahlfors Celebration, Stanford
- 1996 | Texas A&M; University of Massachusetts; University of Chicago
- 1995 | Conference on Complex Analytic Aspects of Teichmüller Spaces, Northhampton, MA; Conference on the Calculus of Variations, Tegernsee Germany; Universität Bonn; University of Illinois (Chicago); University of Chicago; MSRI, Hyperbolic 3-Manifolds and Conformal Dynamics Conference
- 1994 | Cornell; CUNY; MSRI, Harmonic Maps Conference
- 1993 | University of California, Davis; Nevanlinna Colloquium, University of Michigan
- 1992 | University of Washington; Oberwolfach Conference on Teichmüller Theory; Conference on Low-Dimensional Topology, Knoxville, TN; RGI conference on Differential Geometry and Nonlinear PDE, Park City, UT; Pacific Northwest Geometry Seminar, University of Utah
- 1991 | MIT; University of Maryland; AMS Special Session on Low Dimensional Geometry, Philadelphia, PA
- 1990 | Special Session on Moduli Spaces, Albuquerque; AMS Summer Institute on Differential Geometry, UCLA
- 1989 | Texas Geom. & Top. Conf., Austin; AMS Institute on Riemann Surfaces, Arcata; AMS Special Session on Moduli Spaces, Boulder
- 1988 | Princeton; Harvard; Cal. Inst. of Tech.; MSRI Harmonic Maps Conf.; University of Maryland
- 1987 | University of Maryland; University of Conn. (Storrs); Ruhr-Universität, Bochum; CUNY Grad. Center
- 1986 | UC San Diego; University of Maryland

## Publications

1. The Teichmüller Theory of Harmonic Maps, *J. Differential Geom.* **29** (1989), 449–479.
2. Infinite Energy Harmonic Maps and Degeneration of Hyperbolic Surfaces in Moduli Space, *J. Differential Geom.* **33** (1991), 487–539.
3. High Energy Degeneration of Harmonic Maps Between Surfaces and Rays in Teichmüller Space, *Topology* **30** (1991), 517–540.
4. (with S. Wolpert) Real Analytic Structures on the Moduli Space of Curves, *Amer. J. Math.* **114** (1992), 1079–1102.
5. (with B. Zwiebach) The Plumbing of Minimal Area Surfaces, *J. Geom. & Physics*, **15** (1994), 23–56.
6. Harmonic Maps from Surfaces to  $\mathbb{R}$ -Trees, *Math Zeit.*, **218** (1995), 577–593.
7. Harmonic Maps from a Surface and Degeneration in Teichmüller Space, in Proceedings of “Low Dimensional Topology”, Knoxville, 1992, International Press Co. Ltd, Cambridge, MA, 1994, p. 217–239.
8. Review of “Teichmüller Theory in Riemannian Geometry” by A.J. Tromba, *Bull. Amer. Math Soc.* **29** (2) (1993), 285–290.
9. Review of “Teichmüller Theory in Riemannian Geometry” by A.J. Tromba, *Bull. London Math Soc.*, **26** (1994), 315–316.
10. (with H. Masur) Teichmüller space is not Gromov Hyperbolic, *Ann. Acad. Sci. Fenn.*, **20** (1995), 259–267.
11. On the Existence of Jenkins-Strebel Differentials Using Harmonic Maps from Surfaces to Graphs, *Ann. Acad. Sci. Fenn.*, **20** (1995), 269–278.
12. Irregular Homotopies of Harmonic Maps of Surfaces. (abstract appears in *Vorlesungsreihe, Analysis-Seminar SS1994- WS 1995/6*, Universität Bonn, 1997, 89–91).
13. On Realizing Measured Foliations Via Quadratic Differentials of Harmonic Maps to  $\mathbb{R}$ -trees, *J. D’Analyse Math.*, **68** (1996), 107–120.
14. (edited with R. Hardt) Nonlinear Partial Differential Equations and Differential Geometry, Inst. Adv. Stud./Amer. Math. Society, Providence, RI, 1996.
15. (with R. Hardt) Harmonic Extensions of Quasiconformal Maps to Hyperbolic Space, *Indiana J. Math.*, **46** (1997), 155–163.

## Publications, cont.

16. Measured Foliations and Harmonic Maps of Surfaces, *J. Differential Geom.*, **49**(1998), 437-467.
- 17.(with M. Weber) Minimal Surfaces of Least Total Curvature and Moduli Spaces of Plane Polygonal Arcs, *Geom& Funct. Anal.*, **8**(1998),1129-1170.
- 18.(with R. Hardt) Harmonic Extensions of Quasi-Conformal Maps to Hyperbolic Space, in “Harmonic Morphisms, Harmonic Maps, and Related Topics” (C.K. Anand et al, ed.), Chapman and Hall, Boca Raton, 1999, p. 147-152.
19. (with B. Farb) Harmonic Splittings of Surfaces, *Topology*, **40** (2001), 1395-1414.
20. (with M. Weber) Teichmüller Theory and Handle Addition for Minimal Surfaces, *Annals of Math.*, **156** (2002), 713–795.
- 21.(with K. Scannell) The Grafting Map of Teichmüller Space, *Jour. Amer. Math. Soc.* **15** (2002), 893-927.
- 22.(with H. Masur) The Weil-Petersson Isometry Group, *Geom. Ded.*, **93** (2002), 177–190.
23. Flat Structures, Teichmüller theory, and Handle Addition for Minimal Surfaces, Proceedings of the Clay Institute 2001 Summer School on the Global Theory of Minimal Surfaces, (Hoffman et al, editors), Amer. Math. Soc., 2005.
24. Minimal Surfaces, Flat Cone Spheres, and Moduli Spaces of Staircases, in *Six Themes on Variation*, (R. Hardt, ed.), Student Mathematical Library, vol. 26, Amer. Math. Soc, Providence, RI, 2004.
25. (with M. Weber and D. Hoffman) An Embedded Genus-One Helicoid, *Annals of Math*, **169**(2009) no. 2, 347-448.
26. (with M. Weber and D. Hoffman) An Embedded Genus-One Helicoid, *Proc. Nat. Acad. Sci.*, **102**(2005),16566-16568.
27. (with W.H. Meeks III) Minimal Surfaces with the Area Growth of Two Planes; the case of Infinite Symmetry, *Jour. Amer. Math. Soc.*, **20**(2007), 441-465.
28. Minimal Graphs in  $\mathbb{H}^2 \times \mathbb{R}$  and their projections, *Pure & Appl. Math Quarterly J.*, **3**(2007), 881-896.
29. (with D. Dumas) Projective Structures, Grafting and Measured Laminations, *Geometry & Topology*, **12**(2008).

## Publications, cont.

30. (Edited with Mario Bonk, Jane Gilman, Howard Masur, and Yair Minsky) In the tradition of Ahlfors-Bers. V. Papers from the 4th Ahlfors-Bers Colloquium held at Rutgers University, Newark, NJ, May, 2008. *Contemporary Mathematics*, **510**. American Mathematical Society, Providence, RI, 2010. xii+329 pp.
31. (with Petra Bonfert-Taylor, Richard D. Canary, Gaven Martin, and Edward C. Taylor), Ambient Quasiconformal Homogeneity of Planar Domains, *Ann. Acad. Sci. Fenn.*, **35**(2010), no. 1, 275-283.
32. The Weil-Petersson Hessian of Length on Teichmüller Space, *J. Differential Geom.*, **91**(2012), 129-169.
33. (with Matthias Weber) Handle Addition for Doubly-Periodic Scherk Surfaces, *J. Reine Angew. Math.*, **670** (2012), 173-216.
34. (Edited with Alan Reid, Ursula Hämenstadt, Rubí Rodríguez, Steffen Rohde) In the tradition of Ahlfors-Bers. VI. Papers from the 5th Ahlfors-Bers Colloquium held at Rice University, Houston, TX March, 2011. *Contemporary Mathematics*, American Mathematical Society, Providence, RI, 2013.
35. (with Jon Chaika and Howard Masur) Limits in  $\mathcal{PMF}$  of Teichmüller Geodesics, *J. Reine Angew. Math.*, **747** (2019), 1-44.
36. (with David Dumas) Polynomial Cubic Differentials and Convex Polygons in the Projective Plane, *Geom. & Funct. Anal.*, **6** (2015), 1734-1798.
37. (with Yunhui Wu) Uniform Bounds for Weil-Petersson Curvatures, *Proc. Lond. Math. Soc. (3)*, **117** (2018), no. 5, 1041-1076.
38. (with Subhojoy Gupta) Quadratic Differentials, half-plane structures, and harmonic maps to graphs, *Comment. Math. Helv.*, **91** (2016), 317-356.
39. (with Richard Wentworth) Surface group representations to  $SL(2, \mathbb{C})$  and Higgs bundles with smooth spectral data, *Geometry & Topology*, **20**(5), (2016), 3019-3032
40. (with Subhojoy Gupta) Meromorphic quadratic differentials with complex residues and spiralling foliations, *In the tradition of Ahlfors-Bers VII*, Contemp. Math., **696**, Amer. Math. Soc., Providence, RI, 2017, 153-181.
41. (with Subhojoy Gupta) Meromorphic quadratic differentials and measured foliations on a Riemann surface, *Math. Annalen.*, **373** (2019) 73-118.
42. (with Yunhui Wu) Non-Existence of geometric minimal foliations in hyperbolic three-manifolds, *Comment. Math. Helv.*, to appear.



## Publications on Education

1. (with Megan McSpedon, Ann Saterbak) Summer Bridge Program Structured to Cover Most Demanding STEM Topics. *Proceedings ASEE Annual Conference* (New Orleans LA) (June 26, 2016), p.25964-25977. (Won \$250 prize for best paper in division.)
2. Beier, M. E., McSpedon, M. R., MW, Saterbak, A. E.; Selection process of students for a novel STEM summer bridge program, *Proceedings ASEE Annual Conference*, Columbus, OH, June 2017.
3. Bradford, B. C., Beier, M. E., Saterbak, A., McSpedon, M., MW, Kincaid, K.; Examining first-year chemistry outcomes of underprepared STEM students who completed a STEM summer academic bridge program. *Proceedings of the American Society of Engineering Education Annual Meeting*, Columbus, OH, June 2018
4. Bradford, B. C., Beier, M. E., Wolf, M., McSpedon, M., Saterbak, A.; Development and validation of the STEM Study Strategies Questionnaire for STEM college students. *Proceedings of the American Society of Engineering Education Annual Meeting*, Tampa, FL, June 2019(in press).
5. Bradford, B. C., Beier, M. E., Wolf, M., McSpedon, M., Taylor, M.; STEM bridge program participation predicts first and second semester math performance. *Proceedings of the American Society of Engineering Education Annual Meeting*, Tampa, FL, June 2019 (in press).

## External Support (Mathematics Research, Training and Conferences)

|      |   |
|------|---|
| 1987 | NSF Math. Sci Postdoctoral Fellowship                     |
| 1990 | NSF-DMS (part of larger grant to R. Harvey)               |
| 1991 | Alfred P. Sloan Research Fellowship \$30,000              |
| 1993 | NSF-DMS Individual Investigator Award \$60,000            |
| 1997 | NSF-DMS Scientific Equipment \$40,557                     |
| 1996 | NSF-DMS Individual Investigator Award \$60,000            |
| 1999 | NSF-DMS Individual Investigator Award \$241,407           |
| 2002 | NSF-DMS Individual Investigator Award (FRG) \$401,497     |
| 2003 | NSF-DMS VIGRE (training) award (co-I, PI) \$3,821,780     |
| 2005 | NSF-DMS Individual Investigator Award \$563,040           |
| 2005 | NSF-DMS Conference Grant \$19,970                         |
| 2008 | NSF-DMS VIGRE (training) award \$4,957,233                |
| 2010 | NSF-DMS Individual Investigator Award \$462,156           |
| 2011 | NSF-DMS Conference Grant \$49,825                         |
| 2012 | NSF-DMS RTG (training) award (co-I) \$1,786,993           |
| 2013 | NSF-DMS Individual Investigator Award Supplement \$46,560 |
| 2015 | NSF-DMS Individual Investigator Award (FRG) \$410,860     |
| 2018 | NSF-DMS RTG (training) award (co-I) \$2,465,980           |
| 2019 | Simons Fellowship in Mathematics, \$132,000               |

## External Support for Rice Emerging Scholars Program, principal grants, with partners(!)

|       |   |
|-------|---|
| 2012- | Chao Foundation (about \$1,250,000 to date) |
| 2014  | Hearst Foundations \$150,000                |
| 2016  | NSF-DUE \$999,990                           |
| 2017  | Doris Duke Charitable Foundation \$40,000   |
| 2018  | Hearst Foundations \$215,000                |
| 2018  | Doris Duke Charitable Foundation \$40,000   |
| 2019  | Alkek Foundation \$124,000                  |