CURRICULUM VITAE

September, 2013

Brian White
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Born January 20, 1957

Education:

B.S./M.S.	Yale University, 1977
M.S.	Princeton University, 1981
Ph.D.	Princeton University, 1982

Honors, Awards:

(1) 7th highest score on Putnam Mathematics Competition (open to all US and Canadian undergraduates), Fall 1995.
(2) Award for highest ranking Yale senior in sciences, 1977.
(3) National Science Foundation graduate fellowship awarded 1977.
(4) National Science Foundation postdoctoral fellowship 1981-1983.
(5) Alfred P. Sloan Fellowship, 1985-86.
(6) Presidential Young Investigator Award, 1986-91.
(7) Bing Teaching Award, 1993
(8) National Science Foundation support continuously since 1983
(9) Guggenheim Fellowship (awarded Spring 1999)
(10) Invited speaker at the 2002 International Congress of Mathematicians in Beijing
(11) Invited AMS-MAA speaker (one of three) at the 2010 annual joint meeting of the American Mathematical Society and the Mathematical Association of America

Professional Record:

1981-1983	NSF Postdoctoral Research Fellow, Courant Institute
1983-1985	Assistant Professor, Stanford University
1985-1992	Associate Professor, Stanford University
1992-	Professor, Stanford University

Visiting positions: Centre for Mathematical Analysis (Canberra, Australia), U.C. San Diego, Sonderforschungsbereich (Bonn), University of Trento (Italy), Mathematical Sci-

ences Research Centre (Warwick, England), Institut des Hautes Etudes Scientifiques (France), Texas A & M University, University of Paris VII.

Addresses (selected):

- 1982 Felix Klein Collooqium in Dusseldorf. (One of three featured speakers.)
- Hour-long address at the 90th summer meeting of the American Mathematical Society.
- Texas A & M Frontiers of Mathematics lecture series (Spring 1993)
- Lecture Series in Special Postgraduate Summer School in Calculus of Variations in Trento, Italy (August 1993)
- Second annual Bernard Society Lecture at Davidson College (December 1993)
- Plenary address at the 1995 summer meeting of the American Mathematical Society
- Plenary address at the 2000 annual meeting of the Australian Mathematical Society
- Rutgers University Annual D'Atri Memorial Lectures (January, 2001)
- Three invited lectures in Math. Sciences Research Institute Symposium on minimal surfaces (June, 2001)
- Invited lecture at the Gilbarg Memorial Conference at Stanford (April, 2002)
- Invited address at the quadrennial International Congress of Mathematicians in Beijing (August, 2002)
- Invited address at the first annual Yamabe Memorial Symposium at the University of Minnesota (September, 2002)
- Two invited lectures at the March 2003 Hokkaido conference of Variational Problems and Geometric Measure Theory.
- Invited lecture at the Tromba celebration conference in Santa Cruz, May 2-3, 2003.
- Invited lecture at the August 2003 Conference on Geometric Evolution Equations in Hamilton Island, Australia.
- Invited lecture at the December 2003 Workshop on Geometric Analysis (Mathematical Sciences Research Institute in Berkeley)
- Invited lecture at the Pacific Northwest Geometry Seminar (Salt Lake City, Utah), April 2004.
- Invited lecture at the July 2004 workshop on Geometric Evolution Equations (Banff International Research Station)
- Invited lecture at the Texas Geometry and Topology Conference (Texas A & M), October 2004.
- Invited lecture at the 12th Annual Southern California Geometric Analysis Seminar (USCD), February 2005.
- Invited lecture at the International Conference on Calculus of Variations and Nonlinear Partial Differential Equations in Hangzhou, China (June, 2005)
- Invited lecture at the Workshop on Recent Results in Nonlinear Elliptic Equations and Their Interactions with Geometry, Math Sciences Research Institute, Berkeley, CA (November, 2005)
- Invited lecture at the Workshop on Geometric Flows, Harvard University (March 5-6, 2006)

- Plenary address at the IX Southeast Geometry Seminar, Birmingham, Alabama (March, 2006)
- Invited lecture at the Geometric Flows Workshop, Zurich (June, 2006)
- Invited lecture at the Third Symposium of Analysis and Partial Differential Equations, Purdue (May 29, 2007)
- Invited lecture at the International Congress on Minimal Constant Mean Curvature Surfaces, Buzios, Brazil (August 20-24, 2007)
- Invited lecture at the Joint Berkeley-Santa Cruz-Stanford Geometry Seminar (December 6, 2008)
- Invited lecture at Johns Hopkins University (February 13, 2009)
- Invited lecture at the University of Granada, Spain (April, 2009)
- Invited address at the Opening Colloquium for the "Geometric Partial Differential Equations" SFB, Freiburg, Germany (April 24-25, 2009)
- Invited lecture at the joint Harvard-MIT-Brandeis Mathematics Colloquium (May 7, 2009)
- Invited AMS-MAA address (one of three) at the annual meeting of the American Mathematical Society (January 15, 2010)
- Invited lecture at the International Congress on Algebraic, geometric and analytic aspects of surface theory, Buzios, Brazil (April 5–10, 2010)
- Invited lecture at Columbia University (May 5, 2010)
- Lecture at the Calculus of Variations conference in Oberwolfach, Germany (July 18-24, 2010).
- Invited lecture at the Pacific Northwest Geometry Seminar in Eugene, Oregon (October 16-18, 2010).
- Invited lecture at the International Conference on Surface Theory in Seville, Spain (April 5-8, 2011).
- Invited lecture at the Herbert Federer Memorial Conference at Brown University (April 16, 2011).
- Invited lecture at the International Centre for Mathematical Sciences Geometric Analysis conference at Edinburgh (June 20-24, 2011).
- Invited lecture at the 2011 Taiwan International Conference on Geometry in Taipei (July 4-8, 2011).
- Invited lecture at the 2011 Workshop in Partial Differential Equations in Oberwolfach, Germany (August 7-13, 2011).
- Invited lecture at Workshop on Geometric Analysis, Goethe-Universität, Frankfurt (March 27-30, 2012).
- Invited lecture at the Stanford Conference in Memory of Robert Osserman (April 21, 2012).
- Invited lecture at the Geometric Measure Theory Conference in Potsdam (July 2-4(2), 2012).
- Invited lecture at the XVII Escola de Geometria Diferencial in Manaus, Brazil (July 11-20(17), 2012).
- Invited lecture at the 2013 Geomfest/Calabifest (April 12, 2013).

- Two invited lectures at the 2013 Jim Simons Conference at CUNY (May 29/30, 2013).
- Invited lecture at the Variational Problems and Geometric PDE conference, Granada, Spain (June 18, 2013). My lecture was part of a minicourse of three lectures about the recent work of David Hoffman, Martin Traizet, and me about genus g helicoids.
- Invited 4-lecture minicourse at the Park City Math Institute Summer Session, July 1–5, 2013.
- Invited lecture at the Minimal Submanifolds and Related Topics conference in Hannover, Germany (August, 2013).

Graduate students:

- Gary Lawlor. Thesis: "A Sufficient Condition for a Cone to be Area Minimizing" (1988).
- Martin Ross. Thesis: "Stability Properties of Complete Two-Dimensional Minimal Surfaces in Euclidean Space" (1989).
- Jordan Drachman. Thesis: "Soap films bounded by non-closed curves" (1994).
- Claire Chan. Thesis: "The structure of the singular set in energy-minimizing partitions and area-minimizing surfaces in $\mathbf{R}^n$" (1995)
- Tarn Adams. Thesis: "Flat chains in Banach Spaces" (2005).

Supervision of undergraduate honors theses:

- Pouria Dehghanpour (1993).
- Garret Vargas (1993).
- Nathan Reading (1995).
- Keith Chen (1998).
- Xuanming Su (2000).
- Arjun Talwar (2006).

Supervision of postdocs:

- Sisto Baldo
- Karsten Grosse-Braukman
- Claudio Arrezzo
- Daniel Weinholz
- Jose Escobar
- Felix Schultze

PUBLICATIONS

1. The structure of minimizing hypersurfaces mod 4. Invent. Math. **53** (1979), 45–58.

2. Regularity of area-minimizing hypersurfaces at boundaries with multiplicity. Ann. of Math. Studies **103** (1983), 293–301.

3. Tangent cones to 2-dimensional area-minimizing integral currents are unique. Duke Math. Journal **50** (1983), 143–160.

4. Existence of least-area mappings of N-dimensional domains. Ann. of Math. **118** (1983), 179–185.

5. The least area bounded by multiples of a curve. Proc. Amer. Math. Soc. **90** (1984), 230–232.

6. Mappings that minimize area in their homotopy classes. J. Diff. Geometry **20** (1984), 433–446.

7. Generic regularity of unoriented two-dimensional area minimizing surfaces. Ann. of Math. **121** (1985), 595–603. **Correction**: Ann. of Math. **124** (1986), 403.

8. Regularity of singular sets in immiscible fluid interfaces and in solutions to other plateau-type problems. Proc. Centre for Math. Analysis (1985), 244–249.

9. Homotopy classes in sobolev spaces and energy minimizing maps. Bull. Amer. Math. Soc. **13** (1985), 166–168.

10. Infima of energy functionals in homotopy classes of mappings. J. Diff. Geometry **23** (1986), 127–142.

11. A regularity theorem for minimizing hypersurfaces modulo p. Proc. A. M. S. Symposia in Pure Math. **44** (1986), 413–427.

12. The space of m-dimensional surfaces that are stationary for a parametric elliptic integrand. Indiana Univ. Math. J. **36** (1987), 567–602.

13. Complete surfaces of finite total curvature. J. Diff. Geometry **26** (1987), 315–216. **Correction**: JDG **28** (1988), 359–360.

14. Curvature estimates and compactness theorems in 3-manifolds for surfaces that are stationary for parametric elliptic functionals. Invent. Math. **88** (1987), 243–256.

15. Homotopy classes in sobolev spaces and the existence of energy minimizing maps. Acta Math. **160** (1988), 1–17.

16. A strong maximum principle for varifolds that are stationary with respect to even parametric elliptic functionals. (with Bruce Solomon) Indiana Univ. Math. J. **38** (1989), 683–691.

17. New applications of mapping degrees to minimal surface theory. J. Differential Geometry **29** (1989), 143–162.

18. A new proof of the compactness theorem for integral currents. Comm. Math. Helv. **64** (1989), 207–220.

19. Every three-sphere of positive ricci curvature contains a minimal embedded torus. Bull. Amer. Math. Soc. **21** (1989), 71–75.

20. The rate of convergence of a harmonic map at a singular point. (with R. Gulliver) Math. Ann. **283** (1989), 539–549.

21. Some Recent Developments in Differential Geometry. Math. Intelligencer **11** (Autumn, 1989), 41–47.

22. A rigidity theorem for properly embedded minimal surfaces in R^3. (with H. Choi and W. H. Meeks, III) J. Diff. Geometry **32** (1990), 65–76.

23. Minimal Surfaces Bounded by Convex Curves in Parallel Planes. (with W. H. Meeks, III.) Comment. Math. Helv. **66** (1991), 263–278.

24. Existence of smooth embedded surfaces of prescribed topological type that minimize parametric even elliptic functionals on three-manifolds. J. Differential Geometry **33** (1991), 413–443.

25. The space of minimal submanifolds for varying riemannian metrics. Indiana U. Math. J. **40** (1991), 161–200.

26. On the topological type of minimal submanifolds. Topology **31** (1992), 445–448.

27. Nonunique tangent maps at isolated singularities of harmonic maps. Bulletin Amer. Math. Soc. **26** (1992), 125–129.

28. The Space of Minimal Annuli Bounded by an Extremal Pair of Planar Curves. (with W. H. Meeks, III) Comm. in Analysis and Geometry **1**, 415–437 (1993).

29. The structure of branch points in area minimizing surfaces and in pseudo-holomorphic curves. (with Mario Micallef) Annals of Math. **139** (1994), 35–85.

30. A strong minimax property of nondegenerate minimal submanifolds. J. Reine Angew. Math. **457** (1994), 203–218.

31. The bridge principle for stable minimal surfaces. Calculus of Variations and P. D. E. **2** (1994), 405–425.

32. The bridge principle for unstable and for singular minimal surfaces, Comm. Analysis and Geom. **2** (1994), 513–532.

33. Partial regularity of mean-convex hypersurfaces flowing by mean curvature, International Math. Res. Notices **4** (1994), 185–192.

34. Some questions of De Giorgi about mean curvature flow of triply periodic surfaces, pp. 210–213 in *Motion by Mean Curvature*, ed. by B. Buttazzo and A. Visintin (de Gruyter 1994).

35. The topology of hypersurfaces moving by mean curvature, Communications in analysis and geometry **3** (1995), 317–333.

36. Existence of least-energy configurations of immiscible fluids, J. Geom. Analysis. **6** (1996), 151–161.

37. Half of enneper's surface minimizes area pp. 361–368 in "Geometric analysis and the calculus of variations for Stefan Hildebrandt", (ed. J. Jost, International Press 1996)

38. Stratification of minimal surfaces, mean curvature flows, and harmonic maps J. Reine Ang. Math. **488** (1997), 1–35.

39. Classical area minimizing surfaces with real analytic boundaries. Acta Math. **179** (1997), 295–305.

40. The mathematics of F. J. Almgren, Jr.. J. Geom. Anal. **8** (1998), 681–702. Shorter version in: Notices of the Amer. Math. Soc. **44(10)** (December, 1997), 1451–1456.

41. Soap-films bounded by non-closed curves. (with J. Drachman) J. Geom. Anal. **8** (1998), 239–250.

42. A new proof of Federer's structure theorem for k-dimensional sets in $\mathbf{R}^n$. J. Amer Math. Soc. **11** (1998), 693–701.

43. The deformation theorem for flat chains, Acta Math. **183** (1999), 255–271.

44. Rectifiability of flat chains, Ann. of Math. **150** (1999), 165–184.

45. The size of the singular set in mean curvature flow of mean-convex surfaces, J. Amer. Math. Soc. **13** (2000), 665–695.

46. Embeddedness of minimal surfaces with total boundary curvature at most 4π, Ann. of Math. **155** (2002), 209–234.

47. Evolution of curves and surfaces by mean curvature, Proceedings of the International Congress of Mathematicians, Vol. I (Beijing, 2002), 525–538, Higher Ed. Press, Beijing, 2002.

48. The nature of singularities in mean curvature flow of mean-convex sets, J. Amer. Math. Soc. **16** (2003), 123–138.

49. A local regularity theorem for mean curvature flow, Ann. of Math. **161** (2005), 1487–1519.

50. Genus-one helicoids from a variational point of view (with D. Hoffman), Comm. Math. Helv. **83** (2008), 67–813.

51. On the number of minimal surfaces with a given boundary (with D. Hoffman), Astérisque No. **322** (2008), 207–224.

52. Currents and flat chains associated to varifolds, with an application to mean curvature flow, Duke Math. J. **148** (2009), no. 1, 41–62.

53. The geometry of genus-one helicoids (with D. Hoffman), Comment. Math. Helv. **84** (2009), 547–569.

54. Which ambient spaces admit isoperimetric inequalities for submanifolds?, J. Differential Geom. **83** (2009), 213–228.

55. The Maximum Principle for Minimal Varieties of Arbitrary Codimension, Communications in Analysis and Geom. **18** (2010), no. 3, 421432.

56. Axial minimal surfaces in $\mathbf{S}^2 \times \mathbf{R}$ are helicoidal (with D. Hoffman), J. Differential Geometry **87** (2011), 515–523.

57. Sequences of embedded minimal disks whose curvatures blow up on a prescribed subset of a line (with D. Hoffman), Communications in Analysis and Geometry **19** (2011), no. 3, 487502.

58. Topological change in mean convex mean curvature flow, Invent. Math. **191** (2013), no. 3, 501–525.

59. The round sphere minimizes entropy among closed self-shrinkers (with T. Colding, T. Ilmanen, and W. Minicozzi), J. Differential Geom. **95** (2013).

60. Subsequent Singularities in Mean-Convex Mean Curvature Flow, preprint on ArXiv.

61. Sharp Lower Bounds on Density of Area-Minimizing Cones (with T. Ilmanen), preprint on ArXiv.

62. Curvatures of embedded minimal disks blow up on subsets of C^1 curves, preprint on ArXiv.

63. Helicoidal minimal surfaces of prescribed genus, I (with D. Hoffman and M. Traizet), preprint on ArXiv.

64. Helicoidal minimal surfaces of prescribed genus, II (with D. Hoffman and M. Traizet), preprint on ArXiv.

2012/13 Activities

1. Current publications and preprints

(1) *Topological change in mean convex mean curvature flow*, Invent. Math. **191** (2013), no. 3, 501–525.
(2) *The round sphere minimizes entropy among closed self-shrinkers* (with T. Colding, T. Ilmanen, and W. Minicozzi), J. Differential Geom. **95** (2013).
(3) *Subsequent Singularities in Mean-Convex Mean Curvature Flow*, accepted for publication in Calc. of Variations and PDE (preprint on ArXiv).
(4) *Curvatures of embedded minimal disks blow up on subsets of C^1 curves*, preprint on ArXiv.
(5) *Sharp Lower Bounds on Density of Area-Minimizing Cones* (with T. Ilmanen), preprint on ArXiv.
(6) *Helicoidal minimal surfaces of prescribed genus, I* (with D. Hoffman and M. Traizet), preprint on ArXiv.
(7) *Helicoidal minimal surfaces of prescribed genus, II* (with D. Hoffman and M. Traizet), preprint on ArXiv.

2. Invited lectures (2012/13 academic year)

- Invited lecture at the Geometric Measure Theory Conference in Potsdam (July 2-4(2), 2012).
- Invited lecture at the XVII Escola de Geometria Diferencial in Manaus, Brazil (July 11-20(17), 2012).
- Invited lecture at the 2013 Geomfest/Calabifest (April 12, 2013).
- Two invited lectures at the 2013 Jim Simons Conference at CUNY (May 29/30, 2013).
- Invited lecture at the Variational Problems and Geometric PDE conference, Granada, Spain (June 18, 2013). My lecture was part of a minicourse of three lectures about the recent work of David Hoffman, Martin Traizet, and me about genus g helicoids.
- Invited 4-lecture minicourse at the Park City Math Institute Summer Session, July 1–5, 2013.
- Invited lecture at the Minimal Submanifolds and Related Topics conference in Hannover, Germany (August, 2013).

3. Teaching

Fall 2012/13: Math 196: enrollment 9. Math 205a: enrollment 37.
Winter 2012/13: Math 196: enrollment 12.
Spring 2012/13: Math 196: enrollment 9. Math 258: enrollment 8.

Other activities:

(1) Since spring 2005, I have been the director of undergraduate studies. In particular, this means that I am in charge of scheduling all math courses: I decide which courses will be taught, who will teach them, and when they will meet.
(2) Math and Computational Sciences advisory board
(3) Member of the scientific committee for the "Variational Problems and Geometric

PDE Conference", Granada, Spain (June 18, 2013).