

CURRICULUM VITAE : SIDDHARTHA GADGIL

Citizenship. : Indian

Date of Birth. : 11 July 1974.

Education. :

- California Institute of Technology, 1995–1999
 - *Ph. D.* received in June 1999.
Thesis title: On the geometric simple-connectivity of 4-manifolds
Advisor: David Gabai
 - *M.S.* received in June 1998
- Indian Statistical Institute, Calcutta, 1992–1995
Bachelor of Statistics (Honours) received in 1995

Positions Held. :

- *Associate Professor* at the Indian Institute of Science 2006–
- *Associate Professor* at the Indian Statistical Institute, Bangalore, 2002–2006.
- *Simons Instructor* at the State University of New York, Stony Brook, 1999–2002
- *Graduate Teaching Assistant*, California Institute of Technology, 1995–98.

Research interests. :

- *Low-dimensional topology* including 3-manifold topology and geometric topology of smooth 4-manifolds.
- *Geometric Group theory* in particular connections with and applications of topology.
- *Mathematical Biology* in particular RNA secondary structures.

PUBLICATIONS AND PREPRINTS

- (1) *Cobordisms and Reidemeister torsions of homotopy lens spaces*, *Geom. Topol.* **5** (2001), 109–125.
- (2) *The pq-condition for 3-manifold groups*, *Proc. Amer. Math. Soc.* **129** (2001), no. 6, 1873–1875.
- (3) *Topological geodesics and virtual rigidity* (joint with Louis Funar), *Algebr. Geom. Topol.* **1** (2001), 369–380.
- (4) *On the geometric simple-connectivity of 4-manifolds*, Ph.D. thesis, California Institute of Technology, 1999.
- (5) *Equivariant framings, lens spaces and contact structures*, *Pacific Journal of Mathematics* **1** (2003), 73–84.
- (6) *Contact Structures on elliptic 3-manifolds*, *Proc. Amer. Math Soc.* **132** (2004), no. 12, 3705–3714.

- (7) *On the Geometric simple-connectivity of open manifolds* (joint with Louis Funar), Int. Math. Res. Not. 2004, no. 24, 1193–1248.
- (8) *Limits of functions and elliptic operators*. Proc. Indian Acad. Sci. Math. Sci. 114 (2004), no. 2, 153–158.
- (9) *Homology and homeomorphisms of non-orientable surfaces* (joint with Dishant Pancholi), Proc. Indian Acad. Sci. Math. Sci. 115 (2005), no. 3, 251–257.
- (10) *Embedded spheres in $S^2 \times S^1 \# \dots \# S^2 \times S^1$* , Topology Appl. 153 (2006), no. 7, 1141–1151.
- (11) *Extremes of the Indian summer monsoon*, (joint with Sulochana Gadgil, P.N. Vinaychandran and P.A. Francis) Geophysical Research letters, Volume 31, Issue 12, 2004.
- (12) *The Chord algebra and fundamental groups* (joint with Lenny Ng), Appendix to Knot and braid invariants from contact homology II by Lenny Ng, Geom. Topol. 4 (2005), 1603–1637.
- (13) *Degree-one maps, Surgery and four-manifolds*, Bull. Lond. Math. Soc. 39 (2007), no. 3, 419–424
- (14) *On theta characteristics of a compact Riemann surface*. (joint with Indranil Biswas and Parameswaran Sankaran) Bull. Sci. Math. 131 (2007), no. 5, 493–499.
- (15) *Ricci flow and Perelman’s proof of the Poincaré conjecture* (joint with Harish Seshadri), Current Science 91 (2007), 1326–1334.
- (16) *Ricci flow and the Poincaré conjecture*.(joint with Harish Seshadri) Math. Intelligencer 29 (2007), no. 4, 34–43.
- (17) *Least-area surfaces and Incompressibility*, Expos. Math. 26 (2008), no. 1, 93–98.
- (18) *Non-orientable Thom-Pontrjagin constructions and Seifert surfaces*, (joint with Dishant Pancholi), J. Ramanujan Math. Soc. 23 (2008), no. 2, 143–149
- (19) *Watson-Crick pairing for RNA and Milnor invariants of links*, to appear in Journal of Mathematical biology
- (20) *On the topology of manifolds with positive isotropic curvature* (joint with Harish Seshadri), to appear in Proc. Amer. Math. Soc.
- (21) *Open manifolds, Ozsvath-Szabo invariants and Exotic \mathbb{R}^4 ’s*, submitted for publication.
- (22) *One-handles and Concordance kernels of smooth 4-manifolds*, submitted for publication.
- (23) *Algebraic and Geometric intersection numbers for free groups* (joint with Suhas Pandit), submitted for publication.
- (24) *Real theta characteristics and automorphisms of a real curve*(joint with Indranil Biswas), submitted for publication.
- (25) *Surfaces of bounded mean curvature in Riemannian manifolds* (joint with Harish Seshadri), submitted for publication.
- (26) *Degree-one maps and Akbulut corks*, preprint.
- (27) *On the Andrews-Curtis conjecture and Algorithms form Topology*, preprint, arXiv:math.GR/0108053
- (28) *The derived series and virtual Betti numbers*, preprint

- (29) *Conformal structures and harmonic functions* (joint with Harish Seshadri), preprint

EXPOSITORY ARTICLES

- *A topological characterisation of hyperbolic groups (following Bowditch)*, Proceedings of the Workshop on Topological methods in Group theory, I.M.Sc., Chennai, 2002.
- *Dynamics on the circle*, Resonance, November 2003.
- *Chern and total curvature*, Resonance, April 2005.

INVITED LECTURES

- *On the Andrew-Curtis conjecture and Algorithms from topology*, West Coast topology colloquium, Stanford University, April 1999
- *Finite groups that act on S^3 without fixed points*, Colloquium, I.I.Sc., Bangalore, June 2000
- *Introductory lectures (five lectures) on 3-manifolds*, Instructional Conference in low-dimensional topology, Allahabad, December 2000.
- *Cobordisms and Reidemeister torsions of homotopy lens spaces*, Seminar, T.I.F.R., Mumbai, January 2001
- *Equivariant framings of 3-manifolds*, Seminar, T.I.F.R., Mumbai, June 2001
- *Topological Geodesics in 3-manifolds*, Topology seminar, University of Melbourne, August 2001
- *On the Andrew-Curtis conjecture and Algorithms from topology*, Topology Seminar, University of Melbourne, August 2001.
- *On the Andrew-Curtis conjecture and Algorithms from topology*, Special session in Computational topology, American Mathematical Society National meeting, San Diego, January 2002.
- *On the Andrews-Curtis conjecture and Algorithms from Topology*, Groupes et leurs applications en géométrie et topologie, Institut Fourier, Grenoble, 2002.
- *Equivariant framings, Space forms and Contact structures*, Groupes et leurs applications en géométrie et topologie, Institut Fourier, Grenoble, 2002.
- *Random walks and Contact geometry*, Groupes et leurs applications en géométrie et topologie, Institut Fourier, Grenoble, 2002.
- *A topological characterisation of hyperbolic groups (following Bowditch)*, Workshop on Topological methods in Group theory, I.M.Sc., Chennai, 2002 (3 lectures).
- *Contact structures on 3-manifolds*, Colloquium, T.I.F.R., Bangalore, 2002.
- *Topological geodesics in 3-manifolds*, Colloquium, Chennai Mathematical institute, 2002.
- *Topological geodesics in 3-manifolds*, Colloquium, T.I.F.R., Mumbai, 2003.
- *Topological spherical space forms*, Institut Fourier, Grenoble, 2003 (3 lectures).
- *On the Andrew-Curtis conjecture and Algorithms from topology*, Frankfurt-Bocham group theory seminar, Frankfurt, 2003.
- *Topological spherical space forms*, AMS-India meeting, Bangalore, 2003.

- *Symmetries of spheres*, Indian Academy of Sciences Annual Meeting, Varanasi, 2004.
- *Exotic \mathbb{R}^4 's and Ozsvath-Szabo invariants*, I.I.Sc. Mathematics Colloquium, 2005.
- *Automorphisms of surfaces*, H.R.I., Allahabad, June-July 2005 (4 lectures).
- *The Quest for the best metric*, Conference on *Relativity and its impact on Mathematics*, Belgaum, September 2005.
- *Degree-one maps, surgery and low-dimensional topology*, North-Eastern Hill University, Shillong, October 2006.
- *Heegaard Floer theory, Open manifolds and Teichmuller spaces*, Geometric Topology Conference, Peking University, Beijing, 2007.
- *Embedded spheres, intersection numbers and free groups*, International Conference on Surface mapping class groups, North-Eastern Hill University, Shillong 2008.

OTHER ACTIVITIES

- Co-organiser of the conference 'Geometric method in low-dimensional topology', IISc, Bangalore, June 2006.
- Co-organiser of the conference 'Low-dimensional manifolds and Groups', ISI, Bangalore June 2004.
- Co-organiser of the Geometry/Topology seminar at Stony Brook, 1999-2002
- Member, Graduate committee, Department of Mathematics, Stony Brook, 2001-2002
- Colloquium chair, I.S.I. Bangalore, 2005-2006
- Seminar-in-charge, IISc, Bangalore, 2006-
- Member, Research fellows advisory committee, I.S.I. Bangalore, 2005-
- Convener, computer committee, I.S.I. Bangalore, 2004-

Honours and Awards. :

- *Sloan dissertation fellowship* in Mathematics, 1998-99.
- *Associate of the Indian Academy of Sciences*, 2003-2008.
- *Indian National Science Academy medal for Young Scientists*, 2008.
- *Platinum Jubilee medal for Young Scientist*, National Academy of Sciences India, 2008.
- *Ganesh Prasad Memorial Award lecture* at the Indian Mathematical Society, 2007.