

# Curriculum Vitae for Danny Calegari

## Personal Details

- Date of Birth: May 24, 1972
- Citizenship: US/Australian joint

## Education

- May 2000: PhD from UC Berkeley
- December 1994: BA degree with honors at the University of Melbourne

## Research Interests

- Geometry, Dynamics and Topology in low dimensions
- Geometric group theory

## Employment/Research History

- 2007–: Richard Merkin Distinguished Professor of Mathematics at California Institute of Technology
- 2006–2007: Professor at California Institute of Technology
- 2003–2006: Associate Professor at California Institute of Technology
- 2002: Assistant Professor at California Institute of Technology
- 2000–2002: Benjamin Peirce Assistant Professor at Harvard
- 2000: Visiting researcher at UC Davis
- 2000: Consultant for Microsoft Research studying large scale asymptotic geometry of finite combinatorial problems
- 1996–1997: Student member at the Mathematical Sciences Research Institute
- 1995: Research assistant at the University of Melbourne
- 1994: Research assistant at the University of Melbourne
- 1990: Programmer at RMIT (Melbourne) produced diagrams and illustrations for a calculus textbook, and developed graphical software for linear programming
- 1990: Research assistant at Comalco Research Laboratories, used percolation theory to study the dissolution of alumina in a cryolite bath

## Teaching Experience

- 2003–: Taught various classes at Caltech, both graduate level and undergraduate.
- 2001–2002: Designed and taught two graduate topics classes on recent developments on the theory of foliations, and on geometrization, at Harvard
- 2001: (*with Nathan Dunfield*) organized a seminar on Thurston's geometrization theorem for Haken manifolds, at Harvard
- 2000–2001: Designed and taught two upper-division classes on classical geometry and topology at Harvard
- 1997–1998: Grader for graduate classes in algebraic topology and differential geometry at Berkeley
- 1995–1996: Graduate student instructor in calculus and multivariable calculus at Berkeley
- 1995: Organized a reading group on quasiconformal analysis and Teichmüller theory at the University of Melbourne

## Fellowships/Awards/Grants

- 2009–2010: Clay Lecturer
- 2009: Clay Research Award, and Scholarship
- 2007–2010: NSF grant DMS 0707130
- 2004–2007: NSF grant DMS 0405491 (joint with N. Dunfield)
- 2003–2005: Sloan Research Fellow
- 2002: Awarded NSF Postdoctoral fellowship in mathematics (declined)
- 2000–2002: NSF-VIGRE grant recipient
- 2000: Clay Mathematical Institute Liftoff summer fellowship recipient
- 2000: Awarded NSF Postdoctoral fellowship in mathematics (declined)
- 1999–2000: Alfred P. Sloan dissertation fellowship in mathematics
- 1996–1999: NSF graduate fellowship in mathematics

- 1995–1996: Mary Stella Langford traveling fellowship (awarded by the University of Melbourne)
- 1995: A.O.Capell Scholarship (awarded by the University of Melbourne) for the best undergraduate degree in 1994
- 1994: Wyselaskie Scholarship and Nansen and Wilson prizes, awarded by the Mathematics department at the University of Melbourne for best undergraduate thesis
- 1991: Francis Frewin academic Scholarship

#### PhD students supervised

- 2006: Thomas Mack, *Quasiconvex subgroups and nets in hyperbolic groups*
- 2007: Roberto Pelayo, *Diameter bounds on the complex of minimal genus Seifert surfaces for hyperbolic knots*
- 2008: Rupert Venzke, *Braid forcing, hyperbolic geometry, and pseudo-Anosov sequences of low entropy*
- 2009: Dongping Zhuang, *A geometric study of commutator subgroups*

#### Invited Conference Talks and Department Colloquia

- AMS international conference at Denton Texas, May 19–22 1999
- AMS international conference at Melbourne Australia, July 12–16 1999
- AMS conference at Austin Texas, October 8–10 1999
- Wasatch Topology conference at Park City, December 16–18 1999
- Texas Geometry and Topology Conference, February 25–27 2000
- AMS conference at UC Santa Barbara, March 11–12 2000
- Plenary talk at Foliations: Geometry and Dynamics. Conference at Stefan Banach Center in Warsaw, May 29–June 9 2000
- Lecture series at Tokyo Institute of Technology, September 1–10 2000
- pre-AMS-meeting mini-conference, Barnard College, November 3 2000
- Caltech department colloquium, January 16 2001
- Cornell Topology Festival, May 4–6 2001
- Georgia International Topology Conference, May 20–June 2 2001
- 3-manifold Topology Conference at CRM Montreal, June 25–29 2001
- AMS-SMF joint meeting, Ecole Normale Lyon, July 17–20 2001
- Minicourse at Foliations and Geometry 2001, Pontificia Univ. Catolica, Rio de Janeiro, August 2–11 2001
- Topology meeting at Oberwolfach, September 9–15 2001
- Princeton mathematics department lecture series, April 15–19 2002
- Plenary talk at Geometric Topology conference, Shaanxi Normal University China August 12–16 2002
- BATS, October 15 2002
- Wasatch topology conference at Salt Lake City, October 26–27 2002
- UBC department colloquium, November 22 2002
- Lecture series at Seoul National University, February 18–23 2003
- Arkansas Spring lecture series, April 10–12 2003
- Topology of Manifolds of dimensions three and four (60th Birthday conference for Andrew Casson) U. Texas Austin May 19–21 2003
- 60th Birthday conference for Jim Cannon, Park City Utah June 2003
- Conference on topology, plenary lecture series ANU Canberra July 14–25 2003
- UIC Department Colloquium, October 17 2003
- Trends in 3-manifolds conference at CIRGET Montreal, May 2 2004
- KOOK international conference, Awajijima Japan, July 8 2004
- Plenary talk at 48th annual meeting of the Australian Math. Soc., RMIT Melbourne September 28 2004
- University of Melbourne Department Colloquium, October 6 2004
- University of Chicago Department Colloquium, October 29 2004
- Ahlfors-Bers Colloquium plenary speaker, May 19–22 2005

- Rice University Department Colloquium, September 8 2005
- UCLA Department Colloquium, January 12 2006
- Manifolds in Melbourne Conference, January 17–20 2006
- Senior researcher for thematic program on Dynamics and Geometry at the Fields Institute, Toronto, Spring 2006
- MSU special RTG lecture, April 4 2006
- Georgia Topology Conference, May 17–21 2006
- Geometric group theory meeting at Oberwolfach, July 23–29 2006
- UC Riverside Department Colloquium, November 15 2006
- Lecture series at Dynamics Conference at Independent University of Moscow, February 19–23 2007
- Penn State Department Colloquium, March 1 2007
- Cornell Topology Conference, May 21–24 2007
- Paul Schweitzer’s 70th birthday conference, PUC Rio de Janeiro, August 6–10 2007
- Ahlfors Centennial Celebration, University of Helsinki, August 20–24 2007
- Osaka Symposium on Intelligence of Low Dimensional Topology, August 29–September 1 2007
- Akita University, Topology and Computers Conference, September 5–7 2007
- Invited address at Fall annual meeting of the Japanese Mathematical Society, September 21–24 2007
- Encounter with Mathematics, Tokyo, September 28–29 2007
- Topics in Teichmüller Theory and Kleinian Groups, MSRI, November 12–16 2007
- USC Department Colloquium, January 23 2008
- Cornell Department Colloquium, February 7 2008
- Two talks at G3 conference, March 20–23 2008
- Wasatch topology conference, August 9–10 2008
- The 4th William Rowan Hamilton Geometry and Topology Workshop, August 28–30 2008
- Geometric group theory meeting at Oberwolfach, September 7–13 2008
- Lecture series at Paris École Polytechnique, March 30–31 2009
- Georgia International Topology Conference, May 18–29 2009
- 2009/10 Clay Lecturer Melbourne-Sydney-Canberra-Adelaide, July–October 2009
- SUNY Stony Brook Department Colloquium, September 1 2009
- SUNY Stony Brook workshop, September 2 2009
- Nevanlinna Colloquium Kyoto University, September 7–11 2009
- SUNY Buffalo Department Colloquium, October 16 2009
- Rice Texas Geometry and Topology Conference, November 6–8 2009
- UC Riverside AMS Sectional meeting, November 7–8 2009
- Minicourse at workshop in Geometric Group Theory, University of Queensland, December 14–18 2009
- Plenary lecture at AMS western sectional meeting UNM, April 17–18 2010

#### Published and accepted papers

- (1) Strong geometric isolation in 3–orbifolds.  
*Bull. Austral. Math. Soc.* **53** (1996), no. 2, 271–280
- (2)  $\mathbb{R}$ –covered foliations of hyperbolic 3–manifolds.  
*Geom. Topol.* **3** (1999), 137–153
- (3) Foliations transverse to triangulations of 3–manifolds.  
*Comm. Anal. Geom.* **8** (2000), no. 1, 133–158
- (4) A degree one Borsuk–Ulam theorem.  
*Bull. Austral. Math. Soc.* **61** (2000), no.2, 267–268
- (5) Geometry and topology of  $\mathbb{R}$ –covered foliations.  
*Electr. Res. Announc. Amer. Math. Soc.* **6** (2000), 31–39
- (6) The Gromov norm and foliations.  
*Geom. Func. Anal.* **10** (2000), no. 6, 1423–1447
- (7) The geometry of  $\mathbb{R}$ –covered foliations.  
*Geom. Topol.* **4** (2000), 457–515

- (8) Napoleon in isolation.  
*Proc. Amer. Math. Soc.* **129** (2001), no. 10, 3109–3119
- (9) Leafwise smoothing laminations.  
*Algebr. Geom. Topol.* **1** (2001), 579–585
- (10) Almost continuous extension for taut foliations.  
*Math. Res. Lett.* **8** (2001), no. 5–6, 637–640
- (11) Distortion of leaves in product foliations.  
*Top. Appl.* **124** (2002), no. 2, 205–209
- (12) Commensurability of 1–cusped hyperbolic 3–manifolds *with N. Dunfield*.  
*Trans. Amer. Math. Soc.* **354** (2002), no. 7, 2955–2969
- (13) Every orientable 3–manifold is a BF.  
*Algebr. Geom. Topol.* **2** (2002), 433–447
- (14) Problems in foliations and laminations of 3–manifolds.  
*Proc. Symp. Pure Math.* **71** (2003), 297–335
- (15) Foliation with one–sided branching.  
*Geom. Dedicata* **96** (2003), 1–53
- (16) Laminations and groups of homeomorphisms of  $S^1$  *with N. Dunfield*  
*Invent. Math.* **152** (2003), no. 1, 149–204
- (17) Circular groups, Planar groups, and the Euler class.  
*Geom. Topol. Mon* **7**, (2004), 431–491
- (18) Dynamical forcing of circular groups.  
*Trans. Amer. Math. Soc.* **358** (2006), no. 8, 3473–3491
- (19) Shrinkwrapping and the taming of hyperbolic 3–manifolds *with D. Gabai*  
*Jour. Amer. Math. Soc.* **19**, (2006) no. 2, 385–446
- (20) Distortion in transformation groups *with M. Freedman, appendix by Y. de Cornulier*  
*Geom. Topol.* **10** (2006), 267–293
- (21) Real places and torus bundles,  
*Geom. Dedicata* **118** (2006), no. 1, 209–227
- (22) An ascending HNN extension of a free group in  $SL(2, \mathbb{C})$  *with N. Dunfield*  
*Proc. Amer. Math. Soc.* **134** (2006), no. 11, 3131–3136
- (23) Promoting essential laminations.  
*Invent. Math.* **166** (2006), no. 3, 583–643
- (24) Universal circles for quasigeodesic flows,  
*Geom. Topol.* **10** (2006), 2271–2298
- (25) Denominator bounds in Thompson-like groups and flows,  
*Groups, Geom., Dyn.* **1** (2007), no. 2, 101–109
- (26) Stable commutator length in subgroups of  $PL^+(I)$ ,  
*Pacific J. Math.* **232** (2007), no. 3, 257–262
- (27) 3–manifold positivity and the topological Cauchy-Schwarz inequality,  
*Proc. Conf. Osaka City Univ* (2007), 65–70
- (28) Length and stable length,  
*Geom. Func. Anal.* **18** (2008), no. 1, 50–76
- (29) Word length in surface groups with characteristic generating sets,  
*Proc. Amer. Math. Soc.* **136** (2008), no. 7, 2631–2637
- (30) Nonsmoothable, locally indicable group actions on the interval,  
*Algebr. Geom. Topol.* **8** (2008), no. 1, 609–613
- (31) Surface subgroups from homology,  
*Geom. Topol.* **12** (2008), 1995–2007
- (32) What is . . . stable commutator length?  
*Notices Amer. Math. Soc.* **55** (2008), no. 9, 1100–1101
- (33) Large scale geometry of commutator subgroups *with D. Zhuang*  
*Algebr. Geom. Topol.* **8** (2008), no. 3, 2131–2146
- (34) Faces of the scl norm ball

- Geom. Topol.* **13** (2009), 1313–1336
- (35) Stable commutator length is rational in free groups,  
*Jour. Amer. Math. Soc.* **22** (2009), no. 4, 941–961
- (36) Positivity of the universal pairing in 3 dimensions *with M. Freedman and K. Walker*  
*Jour. Amer. Math. Soc.* to appear
- (37) The Euler class of planar groups,  
*Contemp. Math.* to appear
- (38) Stable commutator length in word-hyperbolic groups *with K. Fujiwara*  
*Groups, Geom., Dyn.* to appear
- (39) Combable functions, quasimorphisms, and the central limit theorem *with K. Fujiwara*  
*Ergodic Theory Dyn. Systems* to appear

#### **Papers in progress and submission**

- (1) Hyperbolic 3-manifolds, tameness and Ahlfors’ measure conjecture  
lecture notes from minicourse at the IUM February 2007
- (2) Scl, sails and surgery  
submitted preprint; arXiv:0907.3541
- (3) Knots with small rational genus *with C. Gordon*  
in preparation

#### **Books and other publications**

- (1) Foliations and the Geometry of 3-manifolds  
research monograph 360pp; Oxford University Press, May 2007
- (2) scl  
research monograph 220pp; MSJ Memoirs **20**, June 2009

#### **Editorial board**

- Geometry and Topology
- Journal of Topology and Analysis

#### **Reviewing/refereeing activity**

- Reviewer for Math. Reviews, NSF grant proposals, Georgian–U.S. BGP
- Referee for
  - Advances in Geometry
  - Algebraic and Geometric Topology
  - American Journal of Mathematics
  - Annals of Mathematics
  - Commentarii Mathematici Helvetici
  - Communications in Analysis and Geometry
  - ENS Publications Math.
  - Experimental Mathematics
  - Geometry and Topology
  - Inventiones Mathematicae
  - Journal of the AMS
  - Journal of the Australian MS
  - Journal of the LMS
  - Journal of Differential Geometry
  - Knot Theory and its Ramifications
  - Mathematische Annalen
  - Mathematische Zeitschrift
  - Pacific Journal of Mathematics
  - Topology
  - Transactions of the AMS
  - Transformation groups
  - University of Chicago Monograph series

- Good knowledge of C, C++, L<sup>A</sup>T<sub>E</sub>X, HTML, and fundamentals of UNIX (including Mac OSX) and Linux

#### Conferences Organized

- 2003 Southern California Topology Conference, Caltech
- 2004 (with N. Dunfield) Southern California Topology Conference, Caltech
- 2005 Complex of curves fest, Caltech
- 2007 Southern California Topology Conference, Caltech
- 2009 Southern California Topology Conference, Caltech

#### Mathematical Weblog

- Blog *Geometry and the Imagination* (url: <http://lamington.wordpress.com>)

#### References:

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