**Richard Douglas Canary**

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**Employment:**

Stanford University 1989 – 1991
Gabor Szëgo Assistant Professor of Mathematics
University of Michigan 1991 – Present
Assistant Professor of Mathematics 1991 – 1996
Associate Professor of Mathematics 1996 – 2001
Professor of Mathematics 2001 – Present

**Education:**

Princeton University 1984 – 89
Ph.D. in Mathematics, June 1989
Thesis: Hyperbolic Structures on 3-manifolds with Compressible Boundary
Advisor: Bill Thurston

Warwick University, Coventry, England 1983 – 84
M.S. in Mathematics, July 1985
Thesis: A Boy's Guide to William P. Thurston
Advisor: David Epstein

New College of USF 1980 – 83
B.A. in Mathematics, June 1985
Advisor: Soo Bong Chae

**Visiting Positions:**

Mathematics Institute, University of Warwick, April 1993–July 1993
Ecole Normale Superieure de Lyon, May 1994–July 1994
Stanford University, September 1994–August 1995
Mathematical Sciences Research Institute, Berkeley, January 1995–June 1995
Institut Henri Poincaré, Paris, June 1996
University of Southampton, June–July 1997
Wesleyan University, September–December 2004
Mathematical Sciences Research Institute, Berkeley, August-December 2007
Institut de Mathématiques de Toulouse, May 2009
Institut Henri Poincaré, Paris, February-March 2012
Mathematical Sciences Research Institute, Berkeley, January-May 2015
Mathematical Sciences Research Institute, Berkeley, August 2020-April 2021
Institut Henri Poincaré, Paris, May–June 2025
Yale University, November 2025
Simons Laufer Mathematical Sciences Institue, January-May 2026

**Awards:**

Sloan Foundation Fellowship, 1993–1997.
Fellow of the American Mathematical Society, 2015.
Sigma Xi Distinguished Lecturer, 2015–2017.
Simons Fellowship, 2020–2021.
Simons Fellowship, 2025–2026.
Invited Speaker, International Congress of Mathematicians, Geometry Section, July 2026.

**Editorial duties:**

Memoirs and Transactions of the American Mathematical Society, 2016–2025.
Geometriae Dedicata, 2007–current.
Springer-Verlag Graduate Texts in Mathematics, Advisory board, 2022–current.
Journal de l'École Polytechnique–Mathématiques, 2024–current.

**Papers:**

[1] (with D.B.A. Epstein and P. Green) "Notes on notes of Thurston", in *Analytical and Geometrical Aspects of Hyperbolic Spaces*, Cambridge University Press, 1987, 3–92.

[2] "The Poincaré metric and a conformal version of a theorem of Thurston," *Duke Mathematical Journal* **64**(1991), 349–359.

[3] "On the Laplacian and the geometry of hyperbolic 3-manifolds," *Journal of Differential Geometry*, **36**(1992), 349–367.

[4] "Ends of hyperbolic 3-manifolds," *Journal of the American Mathematical Society*, **6**(1993), 1–35.

[5] "Algebraic convergence of Schottky groups," *Transactions of the American Mathematical Society*, **337**(1993), 235–258.

[6] "Geometrically tame hyperbolic 3-manifolds," in *Differential Geometry: Riemannian Geometry*, *Proceedings of Symposia in Pure Mathematics*, **54**(1993), Part 3, 99–109.

[7] (with E. Taylor) "Kleinian groups with small limit sets," *Duke Mathematical Journal* **73**(1994), 371–381.

[8] (with M. Burger) "A lower bound on $\lambda_0$ for geometrically finite hyperbolic $n$-manifolds," *Journal für die reine und angewandte Mathematik*, **454**(1994), 37–57.

[9] "Covering theorems for hyperbolic 3-manifolds," *Proceedings of Low-Dimensional Topology*, International Press, 1994, 21-30.

[10] "A covering theorem for hyperbolic 3-manifolds and its applications," *Topology*, **35**(1996), 751–778.

[11] (with Y. Minsky) " On limits of tame hyperbolic 3-manifolds," *Journal of Differential Geometry*, **43**(1996), 1–41.

[12] (with J.W. Anderson) "Cores of hyperbolic 3-manifolds and limits of Kleinian groups," *American Journal of Mathematics*, **118**(1996), 745–779.

[13] (with J.W. Anderson, M. Culler and P. Shalen) "Free Kleinian groups and volumes of hyperbolic 3-manifolds," *Journal of Differential Geometry*, **44**(1996), 738–782.

[14] (with J.W. Anderson) "Algebraic limits of Kleinian groups which rearrange the pages of a book," *Inventiones Mathematicae*, **126**(1996), 205–214.

[15] (with E.C. Taylor) "Hausdorff dimension and limits of Kleinian groups," *Geometric and Functional Analysis*, **9**(1999), 283–297.

[16] (with Y. Minsky and E. Taylor) "Spectral theory, Hausdorff dimension and the topology of hyperbolic 3-manifolds," *Journal of Geometric Analysis*, **9**(1999), 18–40.

[17] (with J.W. Anderson) "Cores of hyperbolic 3-manifolds and limits of Kleinian groups II," *Journal of the London Mathematical Society* **61**(2000), 489–505.

[18] "The conformal boundary and the boundary of the convex core," *Duke Mathematical Journal*, **106**(2001), 193–207.

[19] (with J.W. Anderson and D. McCullough) "On the topology of deformation spaces of Kleinian groups," *Annals of Mathematics*, **152**(2000), 693–741.

[20] (with J.W. Anderson) "The visual core of a hyperbolic 3-manifold," *Mathematische Annalen,* **321**(2001), 989–1000.

[21] (with M. Bridgeman) "From the boundary of the convex core to the conformal boundary," *Geometriae Dedicata,* **96**(2003), 211–240.

[22] (with M.Culler, S. Hersonsky, and P. Shalen) "Approximation by maximal cusps in boundaries of deformation spaces," *J. Diff. Geom.*, **64**(2003), 57–109.

[23] (with D. McCullough) "Homotopy equivalences of 3-manifolds and deformation theory of Kleinian groups," *Memoirs of the A.M.S.*, **172**(2004), no. 812, xii+218 pp.

[24] (with S. Hersonsky) "Ubiquity of geometric finiteness in boundaries of deformation spaces of hyperbolic 3-manifolds," *Amer. J. Math.*, **126**(2004), 1193-1220.

[25] "Pushing the boundary," in *In the Tradition of Ahlfors and Bers, III*, Contemporary Mathematics **355**(2004), American Mathematical Society, 109–121.

[26] (with M. Bridgeman) "Bounding the bending of a hyperbolic 3-manifold," *Pac. J. Math*, **218**(2005), 299–314.

[27] (with P. Bonfert-Taylor, G. Martin and E. Taylor) "Quasiconformal homogeneity of hyperbolic manifolds," *Mathematische Annalen*, **331**(2005), 281–295.

[28] (edited with D.B.A. Epstein and A. Marden) *Fundamentals of Hyperbolic Manifolds: Selected Expositions*, London Mathematical Society Lecture Note Series **328**, Cambridge University Press, 2006, xii+335 pages.

[29] (with D.B.A. Epstein and P.L. Green) "Notes on notes of Thurston," a re-issue of [1] which appears in [28] with a new foreword by R.D. Canary, 1–115.

[30] (with C. Leininger) "Kleinian groups with discrete length spectrum," *Bull. L.M.S.*, **39**(2007), 189–193.

[31] (with P. Bonfert-Taylor, M. Bridgeman and E.C. Taylor) "Quasiconformal homogeneity of hyperbolic surfaces with fixed-point full automorphisms," *Math. Proc. Camb. Phil. Soc.*, **143**(2007), 71–84.

[32] (edited with J. Gilman, J. Heinonen, and H. Masur) *In the Tradition of Ahlfors-Bers, IV*, *Contemporary Mathematics* **432**(2007), xvi+229 pages.

[33] "Marden's Tameness Conjecture: History and Applications," in *Geometry, Analysis and Topology of Discrete Groups*, ed. by L. Ji, K. Liu, L. Yang and S.T. Yau, Higher Education Press, 2008, 137–162.

[34] "Introductory bumponomics: the topology of deformation spaces of hyperbolic 3-manifolds," in *Teichmüller Theory and Moduli Problem*, ed. by I. Biswas, R. Kulkarni and S. Mitra, Ramanujan Math. Soc., 2010, 131–150.

[35] (with P. Bonfert-Taylor, G. Martin, E. Taylor and M. Wolf) "Ambient quasiconformal homogeneity of planar domains," *Ann. Acad. Sci. Fenn.*, **35**(2010), 275–283.

[36] (with M. Bridgeman) "The Thurston metric on hyperbolic domains and boundaries of convex hulls," *Geometric and Functional Analysis*, **20**(2010), 1317–1353.

[37] (with P. Bonfert-Taylor, J. Souto and E.C. Taylor) "Exotic quasiconformally homogenous surfaces," *Bull. L.M.S.*, **43**(2011), 57–62.

[38] (with J. Brock, K. Bromberg and Y. Minsky) "Local topology in deformation spaces of hyperbolic 3-manifolds," *Geometry and Topology*, **15**(2011), 1169-1224.

[39] (with Peter Storm) "The curious moduli space of umarked Kleinian surface groups," *Amer. J. Math.*, **134**(2012), 71–85.

[40] (with J. Brock and Y. Minsky) "The classification of Kleinian surface groups II: the ending lamination conjecture," *Annals of Mathematics*, **176**(2012), 1–149.

[41] (with P. Storm) "Moduli spaces of hyperbolic 3-manifolds and dynamics on character varieties," *Comm. Math Helv.* **88**(2013), 221-251.

[42] (with M. Bridgeman) "Uniformly perfect domains and convex hulls: improved bounds in a generalization of a Theorem of Sullivan," *Pure and Applied Mathematics Quarterly*, **9**(2013), 49–71.

[43] (with J. Brock, K. Bromberg and Y. Minsky) "Convergence properties of end invariants," *Geometry and Topology*, **13**(2013), 2877–2922.

[44] (with P. Bonfert-Tayor and E.C. Taylor) "Quasiconformal homogeneity after Gehring and Palka," *Computational Methods and Function Theory* (Gehring Memorial Volume) **14** (2014), 417–430.

[45] (with A. Magid) "Dynamics on $\mathrm{PSL}(2, \mathbf{C})$-character varieties: 3-manifolds with toroidal boundary components," *Groups, Geometry and Dynamcis*, **9**(2015), 149–185.

[46] "Dynamics on character varieties: a survey," *Handbook of Group Actions, Vol. II*, L. Ji, A. Papadopoulos, and S.T. Yau, ed., International Press of Boston, 2015, 175–200.

[47] (with M. Bridgeman, F. Labourie and A. Sambarino) "The pressure metric for Anosov representations," *Geometric and Functional Analysis*, **25**(2015), 1089-1179.

[48] (with J. Brock, K. Bromberg and C. Lecuire) "Convergence and divergence of Kleinian surface groups," *Journal of Topology*, **8**(2015), 811–841.

[49] (with M. Bridgeman and A. Yarmola) "An improved bound in Sullivan's convex hull theorem," *Proceedings of the London Mathematical Society*, **112**(2016) 146–168.

[50] (with M. Lee, A. Sambarino and M. Stover) "Amalgam Anosov representations," *Geometry and Topology*, **21**(2017), 215–251.

[51] (with M. Bridgeman) "Renormalized volume and the volume of the convex core," *Annales de L'Institut Fourier*, **67**(2017), 2083–2098.

[52] (with M. Bridgeman) "Simple length rigidity for Kleinian surface groups and applications," *Commentarii Mathematici Helvetici*, **92**(2017), 715–750.

[53] (with M. Bridgeman and A. Sambarino) "An introduction to pressure metrics for higher Teichmüller spaces," *Ergodic Theory and Dynamical Systems*, **38**(2018), 2001–2035.

[54] (with M. Bridgeman, F. Labourie and A. Sambarino) "Simple root flows for Hitchin representations," *Geometriae Dedicata*(Goldman Birthday Volume), **38**(2018), 57–86.

[55] (with J. Brock, K. Bromberg, C. Lecuire and Y. Minsky) "Local topology in deformation spaces of hyperboilc 3-manifolds II," *Groups, Geometry and Dynamics*, **13**(2019), 767–793.

[56] (with M. Stover and K. Tsouvalas) "New nonlinear hyperbolic groups," *Bulletin of the London Mathematical Society*, **51**(2019), 547–553.

[57] (with M. Bridgeman and F. Labourie) "Simple length rigidity for Hitchin representations," *Advances in Mathematics*, **360**(2020) .

[58] (with J. Brock, K. Bromberg and Y. Minsky) "Windows, cores and skinning maps," *Annales Scientifiques de l'École Normale Supérieure*, **53**(2020), 173–216

[59] (with K. Tsouvalas) "Topological restrictions on Anosov representations," *Journal of Topoogy*, **13**(2020), 1497–1520.

[60] (with H. Bray, L.Y. Kao and G. Martone) "Counting, equidistribution, and entropy gaps at infinity with applications to cusped Hitchin representations," *Crelle's J.* **791**(2022), 1–51.

[61] (with T. Zhang and A. Zimmer) "Cusped Hitchin representations and Anosov representations of geometrically finite Fuchsian groups," *Adv. Math.* **404**(2022), 1–67.

[62] "Hitchin representations of Fuchsian groups," *EMS Surveys in Mathematical Sciences*, **9**(2022), 355-388.

[63] (with H. Bray and L.Y. Kao) "Pressure metrics on deformation spaces of quasifucshian groups with parabolics," *Algebraic and Geometric Topology*, **23**(2023), 3615–3653.

[64] (with H. Bray, L.Y. Kao and G. Martone) "Pressure metrics for cusped Hitchin components," *Advances in Mathematics*, **435**(2023), 24 pages.

[65] (with T. Zhang and A. Zimmer) "Patterson-Sullivan measure for transverse groups," *Journal of Modern Dynamics*, **20**(2024), 319–377.

[66] (with T. Zhang and A. Zimmer) "Patterson-Sullivan measure for relatively Anosov groups," *Mathematische Annalen*, **392**(2025),2309–2363.

[67] (with T. Zhang and A. Zimmer) "Entropy rigidity for cusped Hitchin representations," *Journal of Topology* **19**(2026), 71 pp.

[68] (with P.L. Blayac, F. Zhu and A. Zimmer) "Patterson-Sullivan theory for coarse cocycles," submitted.

[69] (with P.L. Blayac, F. Zhu and A. Zimmer) "Counting, mixing and equidistribution for GPS systems with applications to relatively Anosov groups," submitted.

[70] (with H. Oh and A. Zimmer) "Bi-Lipschitz rigidity of discrete groups," submitted.

[71] (with T. Zhang and A. Zimmer) "Geometry and dynamics of transverse groups," *New Aspects of Teichmüller Theory*, MSJ Advanced Studies in Pure Mathematics, vol. 90, to appear.

[72] "Kleinian viewpoints on higher rank worlds," *Proceedings of the International Congress of Mathematicians 2026*, Volume 4, 63–81.

[73] (with T. Zhang and A. Zimmer) "A rigidity theorem for complex Kleinian groups," *International Mathematics Research Notices*, to appear.

[74] (with M. Bridgman and A. Sambarino) "Bending, entropy and proper affine actions of surface groups," submitted.