
YAIR N. MINSKY

Department of Mathematics
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Academic Appointments:

2003- : Yale University; Einar Hille Professor of Mathematics.
Chair 2010–2014
2001-2002: University of Michigan; visiting Assoc. Prof.
1993-2003: SUNY at Stony Brook; Assoc. Prof. since September 1996.
1992-1993: University of Michigan; Asst. Prof. and NSF Postdoctoral fellow.
1991-1992: Yale University; Gibbs Instructor.
1990-1991: Technion IIT, Israel; Postdoctoral Fellow (on leave from Yale)
1989-1990: Yale University; Gibbs Instructor.

Education:

Princeton University, Ph.D. in Mathematics, June 1989.
Columbia University, M.S. in Computer Science, May 1984.
Princeton University, A.B. in Mathematics, June 1983.

Awards/Grants:

NSF Research Grant DMS-1610827, 2016–2019
NSF Research Grant DMS-1311844, 2013–2016
NSF Conference Grant DMS-1444972, 2014–2015
co-PI, NSF Focused Research Group Grant, DMS-1065872, 2011–2016
NSF Research Grant DMS-1005973, 2010–2013
co-PI, BSF Research Grant 2008034, 2010–2012
NSF Research Grant DMS-0504019, 2005–2010
co-PI, BSF Research Grant 2004149, 2005–2008
co-PI, NSF Focused Research Group Grant, DMS-0554321, 2006–2009
NSF Research Grant DMS-0234540, 2002–2005
co-PI, BSF Research Grant 2000247, 2001–2004
NSF Research Grant DMS-9971596, 1999–2002
Alfred P. Sloan Research Fellowship, 1995–1999
NSF Research Grant DMS-9626233, 1996–1999
NSF Postdoctoral Fellowship, 1992–1995
IBM Graduate Fellowship, 1986–1988.

Research Interests:

Kleinian groups, Teichmüller theory, mapping class groups and geometric group theory, holomorphic dynamics, differential geometry.

Papers:

1. *Harmonic maps, length and energy in Teichmüller space*, J. Differential Geom. **35** (1992), 151–217.
2. *Harmonic maps into hyperbolic 3-manifolds*, Trans. Amer. Math. Soc. **332** (1992), 607–632.
3. *Teichmüller geodesics and ends of hyperbolic 3-manifolds*, Topology **32** (1993), 625–647.
4. *On rigidity, limit sets and end invariants of hyperbolic 3-manifolds*, J. Amer. Math. Soc. **7** (1994), 539–588.
5. *On Thurston's ending lamination conjecture*, Proceedings of Low-Dimensional Topology, May 18-23, 1992, International Press, 1994.
6. *Quasi-projections in Teichmüller space*, J. Reine Angew. Math. **473** (1996), 121–136.
7. *Extremal length estimates and product regions in Teichmüller space*, Duke Math J. **83** (1996), 249–286.
8. *A geometric approach to the complex of curves*, Proceedings of the 37th Taniguchi Symposium on Topology and Teichmüller Spaces (S. Kojima et. al., ed.), World Scientific, 1996, pp. 149–158.
9. With R. Canary, *On limits of tame hyperbolic 3-manifolds*, J. Differential Geom. **43** (1996), 1–41.
10. With M. Lyubich, *Laminations in holomorphic dynamics*, J. Differential Geom. **47** (1997), 17–94.
11. With R. Canary and E. Taylor, *Spectral theory, Hausdorff dimension and the topology of hyperbolic 3-manifolds*, J. Geom. Analysis **9** (1999), 18–40.
12. With H. A. Masur, *Geometry of the complex of curves I: Hyperbolicity*, Invent. Math. **138** (1999), 103–149.
13. *The classification of punctured-torus groups*, Ann. of Math. **149** (1999), 559–626.
14. With H. A. Masur, *Geometry of the complex of curves II: Hierarchical structure*, Geom. Funct. Anal. **10** (2000), 902–974.
15. *Kleinian groups and the complex of curves*, Geom. Topol. **4** (2000), 117–148.
16. With H. A. Masur, *Unstable quasi-geodesics in Teichmüller space*, In the tradition of Ahlfors and Bers: Proceedings of the first Ahlfors-Bers colloquium (I. Kra and B. Maskit, eds.), AMS Contemp. Math., vol. 256 (2000), 239–241.
17. With B. Farb and A. Lubotzky, *Rank-one phenomena in mapping class groups*, Duke Math. J. **106** (2001), 581–597.

18. *Short geodesics and end invariants*, Comprehensive Research on Complex Dynamical Systems and Related Fields (M. Kisaka and S. Morosawa, eds.), vol. 1153, RIMS Kokyuroku, 2000, pp. 1–20. E-print: arXiv:math.GT/0006002.
19. *Bounded geometry in Kleinian groups*, Invent. Math. **146** (2001), 143–192.
20. With B. Weiss, *Nondivergence of horocyclic flows in Moduli space*, J. Reine Angew. Math. **552** (2002), 131–177.
21. *Combinatorial and Geometrical Aspects of Hyperbolic 3-Manifolds*, Kleinian Groups and Hyperbolic 3-Manifolds (Y. Komori, V. Markovic and C. Series, Eds.) London Math. Soc. Lec. Notes, **299** (2003), 3–40.
22. *Curve complexes, surfaces and 3-manifolds*, International Congress of Mathematicians. Vol. II, 10011033, Eur. Math. Soc., Zrich, 2006.
23. *The classification of Kleinian surface groups I: models and bounds*, Ann. of Math. (2) **171** (2010), 1–107.
24. With J. Brock and R. Canary, *The classification of Kleinian surface groups II: the ending lamination conjecture*, Ann. of Math. (2) **176** (2012), 1–149.
25. With J. Brock and R. Canary, *The classification of finitely-generated Kleinian groups*, in preparation.
26. With H. Masur, *Quasiconvexity in the curve complex*, In the Tradition of Ahlfors and Bers, III (W. Abikoff and A. Haas, Eds.), Contemporary Mathematics **355** (2004), 309–320.
27. With J. Behrstock, *Dimension and rank for mapping class groups*, Ann. of Math. **167** (2008), 1055–1077.
28. With Y. Moriah and S. Schleimer, *High distance knots*, Algebr. Geom. Topol. **7** (2007), 1471–1483.
29. With J. Behrstock, L. Mosher and B. Kleiner, *Geometry and rigidity of mapping class groups*, Geom. Topol. **16** (2012) 781–888.
30. With J. Brock and H. Masur, *Asymptotics of Weil-Petersson geodesics I: ending laminations, recurrence and flows*, Geom. Funct. Anal. **19** (2010), 1229–1257.
31. With J. Johnson and Y. Moriah, *Heegaard splittings with large subsurface distances*. Algebr. Geom. Topol. **10** (2010), 2251–2275.
32. *On dynamics of $Out(F_n)$ on $PSL(2, \mathbf{C})$ characters*, Israel J. Math. **193** (2013), 47–70.
33. With J. Brock and H. Masur, *Asymptotics of Weil-Petersson geodesics II: bounded geometry and unbounded entropy*. Geom. Funct. Anal. **21** (2011), 820–850.

34. With J. Behrstock, *Centroids and the rapid decay property in mapping class groups*. J. Lond. Math. Soc. (2) **84** (2011), 765–784.
35. With J. Brock, K. Bromberg and R. Canary, *Local topology in deformation spaces of hyperbolic 3-manifolds*. Geom. Topol. **15** (2011), 1169–1224.
36. With I. Biringer and J. Johnson, *Extending pseudo-Anosov maps to compression bodies*, J. Topol. **6** (2013), no. 4, 1019–1042.
37. With Y. Moriah, *Discrete primitive-stable representations with large rank surplus*, Geom. Topol. **17** (2013), no. 4, 2223–2261.
38. With B. Weiss, *Cohomology classes represented by measured foliations, and Mahler’s question for interval exchanges*. Ann. Sci. Éc. Norm. Supér. (4) **47** (2014), no. 2, 245–284.
39. With T. Gelander, *The dynamics of $\text{Aut}(F_n)$ on redundant representations*. Groups Geom. Dyn. **7** (2013), no. 3, 557–576.
40. With E. Demaine, M. Demaine, J. Mitchell, R. Rivest and M. Patrascu, *Picture-hanging puzzles*. Theory Comput. Syst. **54** (2014), no. 4, 531–550.
41. With J. Brock, K. Bromberg and R. Canary, *Convergence properties of end invariants*. Geom. Topol. **17** (2013) 2877–2922.
42. With R. Kent, *Thick-skinned 3-manifolds*, Geom. Funct. Anal. **24** (2014) 1981–2001.
43. With J. Brock, H. Namazi and J. Souto, *Bounded combinatorics and uniform models for hyperbolic 3-manifolds*, J. Topol. (2016). arXiv:1312.2293.
44. With J. Brock, K. Bromberg and R. Canary, *Windows, cores and skinning maps*, Preprint 2016, arXiv:1601.05482.
45. With S. Taylor, *Fibered faces, veering triangulations and the arc complex*, Preprint 2016, arXiv:1605.08943.

Doctoral theses supervised:

- Erica Klarreich: Ph.D. May 1997, “Semiconjugacies between Kleinian group actions on the Riemann sphere.”
- Kasra Rafi: Ph.D. August 2001, “Teichmüller geodesics and hyperbolic 3-manifolds.”
- Jason Behrstock: Ph.D. May 2004, “Asymptotic structure of Mapping Class Groups.”
- Hossein Namazi: Ph.D. May 2005, “Heegaard splittings and hyperbolic geometry.”

- Young Deuk Kim: Ph.D. May 2005, “The Thurston boundary of Teichmüller space and complex of curves.”
- W. Pat Hooper: Ph.D. May 2006, “On the stability of periodic billiard paths in triangles.”
- Subhojoy Gupta: Ph.D. May 2012, “Asymptoticity of grafting and Teichmüller rays.”
- Chun-Yi Sun: Ph.D. May 2012, “Asymptotic geometry, bounded generation and subgroups of mapping class groups.”
- Babak Modami: Ph.D. May 2013, “Prescribing the behavior of Weil-Petersson geodesics in the moduli space of Riemann surfaces.”
- Tarik Aougab: Ph.D. May 2015, “Effectivizing the geometry of the curve complex.”

Recent service:

Departmental: Chair Fall 2010 to Fall 2014; Director of Undergraduate Studies, 2007–2009; Geometry/Topology seminar organizer; Member of graduate admissions committee; Gibbs committee; several senior hiring committees.

University: Faculty of Arts and Science Senate; Committee on Admission and Financial Aid; Committee on STEM teaching; Diversity Fellows Group; Physical Sciences and Engineering Tenure and Appointments Committee.

Conference organizing: Ahlfors-Bers Colloquium October 2014, March 2011, May 2008; Geometry and Dynamics in Surfaces and 3-manifolds II at Utah, Aug 2009; Geometry and Teichmüller theory conference at Brown, May 2007; Hyperbolic Geometry workshop at Fields Institute, May 2006;

Editorial Boards:

AMS Journal of Conformal Geometry and Dynamics
Duke Mathematical Journal

Graduate courses taught:

Differential geometry; differential topology; problem seminar; point-set topology; algebraic topology. Teichmüller theory; hyperbolic geometry and Kleinian groups; topology of 3-manifolds; geometric group theory; topology and computational geometry.

Undergraduate courses taught:

Linear algebra; calculus; precalculus; multivariable calculus. Freshman honors combinatorics. Geometry and group theory; Introduction to Analysis; Real Analysis; Measure Theory; Functional Analysis. Differential Geometry. Individual reading courses with undergraduates.