Curriculum Vitae Thomas Garrett Kennedy

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Education

- 1984 Ph.D. in Mathematics, University of Virginia
 Advisor: David Brydges, Major field: mathematical physics.
 Doctoral dissertation: "Mean field theory for Coulomb systems"
- 1981 M.A. in Mathematics, Indiana University
- 1977 B.S. in Mathematics, California Institute of Technology

Employment

2009 - present Assoc. Head for the Graduate Program, Mathematics Department, University of Arizona
2008 - 2009 Interim Head, Mathematics Department, University of Arizona
1995 - present Professor, Mathematics Department, University of Arizona
1998 - 1999 Acting Head, Program in Applied Mathematics, University of Arizona
1988 - 1995 Associate Professor, Mathematics Department, University of Arizona
1985 - 1988 Assistant Professor, Physics Department, Princeton University
1984 - 1985 Instructor, Physics Department, Princeton University

Other Appointments

- 1996 present Professor (joint appointment), Physics Department
- 1988 present Member, Graduate Interdisciplinary Program in Applied Mathematics
- 2008 present Member, Graduate Interdisciplinary Program in Statistics

Awards

1986-1989 NSF Mathematical Sciences Post-doctoral Research Fellowship

Grants

2008-2011	NSF DMS-0758649, \$306,938, sole PI
	Critical and Near Critical systems in Statistical Mechanics
2005-2008	NSF DMS-0501168, \$142,337, sole PI
	Mathematical Problems from Statistical Mechanics
2002-2005	NSF DMS-0201566, \$132,199, sole PI
	Problems in Quantum and Classical Statistical Mechanics
1999-2002	NSF DMS-9970608, \$96,837, sole PI
	Crystalline Order in Classical and Quantum Mechanical Systems
1999-2004	NSF DMS 9977116, VIGRE grant, co-PI, 15 $\%$ effort
1999	NSF DMS-9988119, \$36,403, PI, 50 % effort
	International Congress on Mathematical Physics, 2000, London: Travel Funds
1996-1999	NSF DMS-9623509, \$95,922, sole PI
	Statistical Mechanics of Classical and Quantum Lattice Systems
1993-1996	NSF DMS-9303051, \$109,617, sole PI
	Itinerant Electron Systems and Quantum Mechanical Spin Systems
1991-1993	NSF DMS-9103621, \$43,000, sole PI
	Quantum Mechanical, Classical Lattice Spin Systems
1989-1991	NSF DMS-8902248, \$33,900, sole PI
	Classical and Quantum Mechanical Lattice Spin Systems

Ph.D. Dissertation Supervision

Michael Gilbert, current Ph.D. student, Department of Mathematics Shane Passon, current Ph.D. student, Department of Mathematics Benjamin Dyhr, Department of Mathematics, Ph.D., August 2009 Karl Haller, Program in Applied Mathematics, Ph.D., August 1998. Martin Pokorny, Program in Applied Mathematics, Ph.D., August 1992.

Published Articles

- A lower bound on the partition function for a classical charge symmetric system. J. Stat. Phys. 28, 633-638 (1982).
- Debye-Huckel theory for charge symmetric Coulomb systems. Commun. Math. Phys. 92, 269-294 (1983).
- 3. Mean field theory for Coulomb systems. J. Stat. Phys. 37, 529-559 (1984).
- 4. Long range order in the anisotropic quantum ferromagnetic Heisenberg model. Commun. Math. Phys. 100, 447-462 (1985).

- (with Paul Federbush) Surface effects in Debye screening. Commun. Math. Phys. 102, 361-423 (1985).
- (with Chris King) Symmetry breaking in the lattice abelian Higgs model. Phys. Rev. Lett. 55, 776-778 (1985).
- (with Chris King) Spontaneous symmetry breakdown in the abelian Higgs model. Commun. Math. Phys. 104, 327-347 (1986).
- (with Elliott Lieb) An itinerant electron model with crystalline or magnetic long range order. Physica 138A, 320-358 (1986).
- (with David Brydges) Mayer expansions and the Hamilton-Jacobi equation. J. Stat. Phys. 48, 19-49, (1987).
- (with Ian Affleck, Elliott Lieb, Hal Tasaki) Rigorous results on valence-bond ground states in antiferromagnets. *Phys. Rev. Lett.* 59, 799-802 (1987).
- (with Elliott Lieb) Proof of the Peierls instability in one dimension. *Phys. Rev. Lett.* 59, 1309-1312 (1987).
- (with Ian Affleck, Elliott Lieb, Hal Tasaki) Valence-bond ground states in isotropic quantum antiferromagnets. Commun. Math. Phys. 115, 477-528 (1988).
- 13. (with Elliott Lieb, Hal Tasaki) A two dimensional isotropic quantum antiferromagnet with unique disordered ground state. J. Stat. Phys. 53, 383 (1988).
- (with Elliott Lieb, B. Sriram Shastry) Existence of Néel order in some spin 1/2 Heisenberg antiferromagnets. J. Stat. Phys. 53, 1019 (1988).
- (with Elliott Lieb, B. Sriram Shastry) The XY model has long-range order for all spins and all dimensions greater than one. *Phys. Rev. Lett.* 61 2582 (1988).
- A fixed point equation for the high temperature phase of discrete lattice spin systems. J. Stat. Phys. 59, 195-220 (1990).
- Exact diagonalization of open spin 1 chains. J. Phys.: Condens. Matter 2, 5737-5745 (1990).
- 18. (with Dandan Guo and Sumit Mazumdar) Spin-Peierls transitions in S > 1/2 Heisenberg chains. Phys. Rev. B41, 9592 (1990).
- Ornstein-Zernike decay in the ground state of the quantum Ising model in a transverse magnetic field. *Commun. Math. Phys.* 137, 599-615 (1991).
- 20. (with Hal Tasaki) Hidden $Z_2 \times Z_2$ symmetry breaking in Haldane gap antiferromagnets. Phys. Rev. B45, 304 (1992).
- 21. (with Hal Tasaki) Hidden symmetry breaking and the Haldane phase in S = 1 quantum spin chains. Commun. Math. Phys. 147, 431-484 (1992).
- Solutions of the Yang-Baxter equation for isotropic quantum spin chains. J. Phys. A: Math. Gen. 25, 2809 (1992).
- 23. Some rigorous results on majority rule renormalization group transformations near the critical point. J. Stat. Phys. 72, 15-37 (1993).

- Some rigorous results on the ground states of the Falicov-Kimball model. Rev. Math. Phys. 6, 901-925 (1994). Also in *The State of Matter*, Michael Aizenman and Huzihiro Araki (eds.) World Scientific, 1994.
- Ballistic behavior in a 1-d weakly self-avoiding walk with decaying energy penalty. J. Stat. Phys. 77, 565-579 (1994).
- Nonpositive matrix elements for Hamiltonians of spin 1 chains. J. Phys.: Condens. Matter 6, 8015-8022 (1994).
- (with Karl Haller) Absence of renormalization group pathologies near the critical temperature - two examples. J. Stat. Phys. 85, 607-637 (1996).
- 28. Majority Rule at Low Temperatures for the Square Lattice with b = 2 and for the Triangular Lattice. J. Stat. Phys. 86, 1089-1107 (1997).
- 29. Phase separation in the neutral Falicov-Kimball model. J. Stat. Phys. **91**, 829-843 (1998).
- (with Karl Haller) Periodic Ground States in the Neutral Falicov-Kimball Model in Two Dimensions. J. Stat. Phys. 102, 15-34 (2001).
- 31. A faster implementation of the pivot algorithm for self-avoiding walks. J. Stat. Phys. **106**, 407-429 (2002).
- (with Nilanjana Datta) Expansions for one quasiparticle states in spin 1/2 systems. J. Stat. Phys. 108, 373-399 (2002).
- Monte Carlo tests of SLE predictions for the 2D self-avoiding walk. *Phys. Rev. Lett.* 88, 130601 (2002).
- Conformal invariance and stochastic Loewner evolution predictions for the 2D self-avoiding walk - Monte Carlo tests. J. Stat. Phys. 114, 51-78 (2004).
- 35. (with Nilanjana Data) Instability of interfaces in the antiferromagnetic XXZ chain at zero temperature, *Commun. Math. Phys.* **236**, 477 (2003).
- Expansions for Droplet States in the Ferromagnetic XXZ Heisenberg Chain. Markov Processes and Related Fields 11, 223 (2005).
- Compact packings of the plane with two sizes of discs, Discrete and Computational Geometry 35, 255-267 (2006).
- A fast algorithm for simulating the chordal Schramm-Loewner evolution. J. Stat. Phys. 128, 1125-1137 (2007).
- 39. The length of an SLE Monte Carlo studies. J. Stat. Phys. 128, 1263-1277 (2007).
- 40. Computing the Loewner driving process of random curves in the half plane. J. Stat. Phys. **131**, 803-819 (2008).
- 41. (with Michel Bauer and Denis Bernard) Conditioning SLE's and loop erased random walks. J. Math. Phys., 50, 043301 (2009).
- 42. Renormalization group maps for Ising models in lattice gas variables. J. Stat. Phys. 140, 409-426 (2010).

- 43. Numerical computations for the Schramm-Loewner Evolution. J. Stat. Phys. 137, 839-856 (2009).
- 44. (with Ben Dyhr, Michael Gilbert, Gregory F. Lawler, Shane Passon). The self-avoiding walk in a strip J. Stat. Phys. 144, 1-22 (2011).
- 45. Transforming fixed-length self-avoiding walks into radial $SLE_{8/3}$. J. Stat. Phys. to appear (2011).

Note: The recent papers above are archived in arXiv.org. Links are on my home page.

Invited Talks : 1998 to Present

- 1. Phase separation and periodic ground states in the neutral Falicov Kimball model, invited talk at the conference "Mathematical Results in Statistical Mechanics," Marseille, France, July 27-31,1998.
- 2. Weakly self-avoiding walks, invited talk at the conference "Self-interacting Random Processes," held at Matematisches Forschungstitut Oberwolfach in Germany from May 21-27, 2000.
- 3. Weakly self-avoiding walks, invited talk, University of Geneva, June 5, 2000.
- 4. *Weakly self-avoiding walks*, invited talk, Institut de Physique Théorique at the École Polytechnique Fédérale de Lausanne, Switzerland, June 5, 2000.
- 5. Quasiparticles and interfaces in anisotropic quantum Heisenberg chains, invited talk, Ecole Polytechnique Féderal de Lausanne (Switzerland), Oct 10, 2002.
- 6. Monte Carlo tests of conformal invariance and SLE predictions for the self-avoiding walk, invited talk, Ecole Polytechnique Féderal de Lausanne (Switzerland), Oct 25, 2002.
- 7. Monte Carlo tests of conformal invariance and SLE predictions for the self-avoiding walk, invited talk, Universite de Paris Sud (Orsay, France), Nov 7, 2002.
- 8. Monte Carlo tests of conformal invariance and SLE predictions for the self-avoiding walk, invited talk, Centre de Physique Théorique, Luminy, France, Nov 29, 2002.
- 9. Monte Carlo tests of SLE predictions for the self-avoiding walk, invited talk at the miniconference "Autour du SLE" which was part of the special trimester "Geometry and Statistics of Random Growth" at the Henri Poincare Institute (Paris, France), January 16, 2003.
- Quasi-particles and interfaces in quantum lattice systems, invited talk at the conference "Inhomogeneous Random Systems" at the University of Cergy-Pontoise, France, Jan 28-29, 2003.
- 11. Monte Carlo tests of conformal invariance and SLE predictions for self-avoiding walk, invited talk, Physics Department, University of Geneva, Switzerland, Feb 3, 2003.

- Itinerant Electron Systems An Introduction and Review of Rigorous Results, and Interfaces and Droplets in the Quantum XXZ Heisenberg Model, invited talks at the conference "Classical and Quantum Phase Transitions, Crystal Formation and Bose-Einstein Condensation" at the CIRM in Luminy, France, March 17-21, 2003.
- 13. Monte Carlo tests of conformal invariance and SLE predictions for the self-avoiding walk, invited talk, Physics department, ETH, Zurich, Switzerland, May 26, 2003.
- 14. Monte Carlo tests of conformal invariance and SLE predictions for the self-avoiding walk and An introduction to simulating the self-avoiding walk, invited talks at the conference "Conformal Invariance and Random Spatial Processes" at the ICMS in Edinburgh, Scotland, July 9-18, 2003.
- 15. Monte Carlo comparisons of the self-avoiding walk and SLE How should SLE be parametrized?, invited talk at the conference "Dynamics, Probability, and Conformal Invariance," Banff International Research Station, Banff, Canada, March 12-17, 2005.
- 16. Monte Carlo comparisons of the self-avoiding walk and SLE as parametrized curves, invited talk at the conference "93rd Statistical Mechanics Conference" at Rutgers University, May 15, 2005.
- 17. Monte Carlo comparisons of the self-avoiding walk and SLE as parametrized curves, invited talk at the conference "Critical Scaling for Polymers and Percolation" at the Banff International Research Station, May 28 to June 2, 2005.
- 18. The length of an SLE Monte Carlo studies, invited talk, Kavli Institute for Theoretical Physics, September 19, 2006.
- 19. Numerical simulation of random curves, invited series of four talks, 2008 Enrage Topical School on "Growth and Shapes," Institut Henri Poincaré, Paris, June 2-6, 2008.
- 20. Testing for SLE using the driving process, invited talk, 13th Itzykson Conference "Puzzles of Growth," Saclay, France, June 9-11, 2008.
- 21. Monte Carlo Studies of Self-Avoiding Walks and Loops, invited talk at the conference "Stochastic Loewner Evolution and Scaling Limits," CRM, Montreal, Canada, August 4-8, 2008.
- 22. Renormalization group maps for Ising models in lattice gas variables, invited talk at the conference "The Renormalization Group and Statistical Mechanics," University of British Columbia, Vancouver, Canada, July 6-12, 2009.
- 23. The 2d Self-avoiding walk bridges, strips and hitting densities, Probability seminar, University of Chicago, February 5, 2010.
- 24. Conformal invariance and covariance of the 2d self-avoiding walk, invited talk at the AMS Western Sectional Meeting, Albuquerque, New Mexico, April 17, 2010.
- 25. Renormalization group maps for Ising models in lattice gas variables, invited talk at the conference "103rd Statistical Mechanics Conference," Rutgers University, New Brunswick, New Jersey, May 9, 2010