

Dana Randall

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EDUCATIONAL BACKGROUND

Ph.D.	1994:	University of California at Berkeley,	Computer Science
A.B. (high honors)	1988:	Harvard University,	Mathematics

EMPLOYMENT HISTORY

GEORGIA TECH:

Associate Dean for Access & Advancement	College of Computing	2025–present
Regents' Professor	School of Computer Science	2025–present
Adjunct Professor	School of Mathematics	1999–present
Co-Executive Director	Institute for Data Engineering and Science	2016–2019
Director	Algorithms and Randomness Center	2014–2016
ADVANCE Professor	College of Computing	2011–2021
Professor	School of Computer Science	2009–2025
Associate Professor	School of Computer Science	2002–2009
Assistant Professor	College of Computing	1999–2002
Assistant Professor	Schools of Mathematics and Computing	1996–1999

VISITING / EXTERNAL / POSTDOCTORAL POSITIONS:

External Faculty	Santa Fe Institute	2018–2021; 2025–present
Chern Professor	Simons Laufer Mathematical Sciences Inst.	Fall 2023
Eisenbud Professor	Mathematical Sciences Research Institute	Spring 2012
Visiting Researcher	Newton Institute for Mathematical Sciences	Fall 2002
Visiting Researcher	Microsoft Research, Redmond. WA	Fall'97, Sum'00
Postdoctoral Researcher	Computer Science Department, Princeton University (DIMACS)	1995-1996
Member	School of Mathematics, Institute for Advanced Study (IAS)	1994-1995

NATIONAL DISTINCTIONS AND AWARDS

Fellow of the Association for Computing Machinery (ACM), class of 2025.

Fellow of the American Mathematical Society (AMS), inaugural class, 2012.

National Associate of the National Academies, lifetime member, appointed 2007.

Kavli Fellow, National Academies, 1997, 2004, 2005, 2006.

IBM Faculty Partnership Award, 2003.

Alfred P. Sloan Research Fellow, 2001–2003.

NSF Faculty Early Career Development (CAREER) Award, 1997–2001.

AT&T Ph.D. Fellowship, 1989–1993.

KEYNOTE AND PLENARY ADDRESSES

Congressional Briefing on “Collective Intelligence: How Local Interactions Determine Global Coordination.” Sponsored by AMS and SLMATH, April 2024, Washington D.C.

Plenary Talk. ACM-SIAM Symposium on Discrete Algorithms (SODA), January 2024, Alexandria, VA.

“Inspiration Talk” at the Research Spotlight Workshop at the 55th ACM Symposium on Theory of Computing (STOC), June 2023, Orlando, FL.

Plenary Talk. Symposium on Theoretical Aspects of Computing (STACS), March 2020, Montpellier, France (cancelled due to COVID-19).

The Birnbaum Lecture at the 2019 Pacific Northwest Probability Seminar conference, October 2019, Seattle, WA.

Plenary Talk. 25th International Conference on DNA Computing and Molecular Programming (DNA), August 2019, Seattle, WA.

Plenary Talk. 30th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA), Luminy, France, June 2019.

AMS Invited (Keynote) Address. Joint Mathematics Meetings, San Diego, CA, January 2018.

Plenary Talk. 31st International Symposium on Distributed Computing (DISC), Vienna, Austria, upcoming October 2017.

Keynote Address. 9th IEEE International Workshop on Network Science for Communication Network (NetSciCom), Atlanta, GA, May 2017.

Principal Speaker. 29th Annual Cumberland Conference on Combinatorics, Graph Theory and Computing, Nashville, TN, May 2017.

Keynote Speaker. 40th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing (ACCMCC), Newcastle, Australia, December 2016.

Plenary Speaker. Applied Probability, Combinatorics and Optimisation (APCO), Newcastle, Australia, December 2016.

Samuel Conte Distinguished Lecture, “Phase Transitions in Algorithms and Applications,” Computer Science Department, Purdue University, January 2015.

Distinguished Lecture at the National Science Foundation, Directorate for Computer and Information Science and Engineering (CISE), “Sampling, Random Structures and Phase Transitions,” June 2013.

D.W. Weeks Lecture in Mathematics, “Domino Tilings of the Chessboard: An Introduction to Sampling and Counting,” MIT, March 2013.

Plenary Speaker. The 10th Latin American Theoretical Informatics Symposium (LATIN), Arequipa, Peru, April 2012.

The Rees Distinguished Lectures. Department of Mathematics, University of Delaware, November 2012.

Plenary Speaker. The 12th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), Bergen, Norway, June 2010.

The 2009 AMS Arnold Ross Lecture. Augusta National Science Center, Augusta, GA. October 2009.

Keynote Address. The 4th Annual Conference on Nanoscience (FNANO), Snowbird, UT, April 2007.

Plenary Speaker. The 28th Annual SIAM Southeast Atlantic Sectional Meeting, Johnson City, TN, April 2004.

AMS Invited (Keynote) Address. Joint Mathematics Meetings, including the 109th Annual Meeting of the AMS, Baltimore, MD, January 2003.

Tutorial Presenter. *44th IEEE Symposium on Foundations of Computer Science (FOCS)*, 2003.

Distinguished Lecture in Computer Science (in the “Top Guns” series). University of Virginia, January 2001.

Plenary Speaker. 5th Annual Symposium on Mathematical Foundations of Computer Science (MFCS), Mariánské Lázně, Czech Republic, August 2001

Principal Speaker. 14th Annual Cumberland Conference on Combinatorics, Graph Theory and Computing, Memphis, TN, May 2001.

I. RESEARCH AND CREATIVE SCHOLARSHIP

A. Thesis

Ph.D. Thesis

Title: Counting in Lattices: Markov Chain Problems from Combinatorics
Completed: 1994
Advisor: Dr. Alistair Sinclair
College: University of California at Berkeley

B. Published Journal Papers (refereed)

Note: Articles in Theoretical Computer Science and Mathematics typically alphabetize authors.

1. S. Oh, D. Randall and A.W. Richa, “Adaptive collective responses to local stimuli in anonymous dynamic networks.” *Theoretical Computer Science* (Invited), **1024**: 114904, 2025.
2. J. Calvert and D. Randall, “A local–global principle for nonequilibrium steady states.” *Proceedings of the National Academy of Sciences*, **121**, (42), 2024.
3. A. T. Liu, M. Hempel, J. F. Yang, A. M. Brooks, A. Pervan, V. B. Koman, G. Zhang, D. Kozawa, S. Yang, D. Goldman, M. Z. Miskin, A. W. Richa, D. Randall, T. D. Murphey, T. Palacios, and M. S. Strano, “Colloidal robotics,” *Nature Materials*, **22**: 1453–1462, 2023.
4. P. Bhakta, S. Miracle, D. Randall and A. Streib. “Mixing times of Markov chains for self-organizing lists and biased permutations.” *Random Structures & Algorithms*, **61**: 638–665, 2022.
5. S. Li, B. Dutta, S. Cannon, J.J. Daymude, R. Avinery, E. Aydin, A. Richa, D. Goldman, and D. Randall. “Programming active cohesive granular matter with mechanically induced phase changes” *Science Advances*, **7** (17), 2021.
6. S. Greenberg, D. Randall and A. Streib. “Sampling biased lattice configurations using exponential metrics,” *Combinatorics, Probability and Computing*, **29**: 672–697, 2020.
7. A. Blanca, Y. Chen, D. Galvin, D. Randall and P. Tetali. “Phase Coexistence for the Hard-Core Model on \mathbf{Z}^2 ”. *Combinatorics, Probability and Computing*, **28**: 1-22, 2019.
8. M. Andrés Arroyo, S. Cannon, J.J. Daymude, D. Randall, A.W. Richa. “A stochastic approach to shortcut bridging in programmable matter,” *Natural Computing*, **17**: 723-741, 2018.
9. S. Cannon, J.J. Daymude, W. Savoie, R. Warkentin, S. Li, D.I. Goldman, Dana Randall and A.W. Richa. “Phototactic Supersmarticles”. *Artificial Life and Robotics*, 1-10, 2018.
10. Sarah Cannon, Sarah Miracle and Dana Randall. “Phase Transitions in Random Dyadic Tilings and Rectangular Dissections”. *SIAM Journal on Discrete Math.* **32**: 1966-1992, 2018.
11. P. Bhakta and D. Randall. “Sampling weighted perfect matchings on the square octagon lattice.” *Theoretical Computer Science*, **699**: 21–32, 2017.
12. N. Bhatnagar and D. Randall. “Simulated Tempering and Swapping on Mean-Field Models.” *Journal of Statistical Physics*, **164**: 495–530, 2016.

13. S. Miracle, D. Randall, A. Streib and P. Tetali. “Mixing times of Markov chains on 3-orientations of planar triangulations.” *SIAM Journal on Discrete Math*, **30**: 801–831, 2016.
14. S. Miracle and D. Randall. “Algorithms to Approximately Count and Sample Conforming Colorings of Graphs.” *Discrete Applied Mathematics*, **210**: 133–149, 2016.
15. D. Galvin, J. Kahn, D. Randall and G. Sorkin. “Phase coexistence and torpid mixing in the 3-coloring model on \mathbf{Z}^d .” *SIAM Journal on Discrete Mathematics*, **29**: 1223–1244, 2015.
16. I. Bezáková, N. Bhatnagar and D. Randall. “On the Diaconis-Gangolli Markov Chain for sampling contingency tables with cell-bounded entries,” *Journal of Combinatorial Optimization*, **22**: 457–468, 2011.
17. S. Greenberg and D. Randall. “Slow Mixing of Markov Chains using Fault Lines and Fat Contours.” *Algorithmica*, **54**: 911–927, 2010.
18. M. Cryan, M. Dyer and D. Randall. “Approximately Counting Integer Flows and Cell-Bounded Contingency Tables.” *SIAM Journal on Computing*, **39**: 2683–2703, 2010.
19. S. Greenberg and D. Randall. “Convergence Rates of Markov Chains for Some Self-Assembly and Non-Saturated Ising Models.” *Theoretical Computer Science (Invited)* **410**: 1417–1427, 2009.
20. N. Bhatnagar, D. Randall, V. Vazirani and E. Vigoda. “Random Bichromatic Matchings.” *Algorithmica*, **50**: 418–445, 2008.
21. R. Martin and D. Randall. “Disjoint Decomposition of Markov Chains and Sampling Circuits in Cayley graphs.” *Combinatorics, Probability and Computing*, **15**: 411–448, 2006.
22. D. Randall. “Rapidly Mixing Markov Chains with Applications in Computer Science and Physics.” *Computing in Science and Engineering*, **8**: 30–41, 2006.
23. A. Karlin, C. Kenyon, and D. Randall. “Dynamic TCP Acknowledgement and Other Stories About $e/(e - 1)$.” *Algorithmica (Invited)*, **36**: 209–224, 2003.
24. S. Janson, D. Randall, and J. Spencer. “Random Dyadic Tilings of the Unit Square.” *Random Structures and Algorithms*, **21**: 225–251, 2002.
25. N. Madras and D. Randall. “Markov Chain Decomposition for Convergence Rate Analysis.” *Annals of Applied Probability*, **12**: 581–606, 2002.
26. M. Luby, D. Randall, and A. J. Sinclair. “Markov Chains for Planar Lattice Structures.” *SIAM Journal on Computing*, **31**: 167–192, 2001.
27. D. Randall and P. Tetali. “Analyzing Glauber Dynamics by Comparison of Markov Chains.” *Journal of Mathematical Physics*, **41**: 1598–1615, 2000.
28. D. Randall and A. J. Sinclair. “Self-Testing Algorithms for Self-Avoiding Walks.” *Journal of Mathematical Physics*, **41**: 1570–1584, 2000.
29. C. Kenyon, D. Randall and A. J. Sinclair. “Approximating the Number of Monomer-Dimer Coverings of a Lattice.” *Journal of Statistical Physics*, **83**: 637–659, 1996.

30. D. Randall. “Efficient Generation of Random Nonsingular Matrices.” *Random Structures and Algorithms*, **4**: 111–118, 1993.
31. P. G. Doyle, J. C. Lagarias, and D. Randall. “Self-Packing of Centrally Symmetric Convex Bodies in R^2 .” *Discrete and Computational Geometry*, **8**: 171–189, 1992.
32. A. M. Odlyzko and D. Randall. “On the Transformations of Some Graphs.” *Complex Systems*, **1**: 203–209, 1987.

C. Published Books or Parts of Books

1. C. Borgs, J. T. Chayes, and D. Randall. “The Van den Berg-Kesten-Reimer Inequality.” In *Perplexing Probability Problems: Papers in Honor of Harry Kesten*, Birkhäuser (M. Bramson and R. Durrett, editors), 159–173, 1999.

D. Edited Proceedings and Collections

1. Editor of the *Proceedings of the 22nd ACM/SIAM Symposium on Discrete Algorithms (SODA)*, San Francisco, CA, January 2011.

E. Conference Presentations

E.2. Conference Presentations with Proceedings (refereed)

Note: Articles in Theoretical Computer Science and Mathematics typically alphabetize authors.

1. J. Brionnes, J. Calvert, N. Egan, S. Oh, D. Randall and A.W. Richa. “Single Bridge Formation in Self-Organizing Particle Systems.” *38th International Symposium on Distributed Computing (DISC)*, Madrid, Spain, October 2024.
2. S. Oh, D. Randall and A.W. Richa. “Adaptive Collective Responses to Local Stimuli in Anonymous Dynamic Networks.” *2nd Symposium on Algorithmic Foundations of Dynamic Networks (SAND)*, Pisa, Italy, June 2023.
3. S. Oh, D. Randall and A.W. Richa. “Brief Announcement: Foraging in Particle Systems via Self-Induced Phase Changes.” *36th International Symposium on Distributed Computing (DISC)*, 2022.
4. Z. Zhao, C. Hettle, S. Gupta, J. Mattingly, D. Randall and G. Herschlag. “Mathematically Quantifying Non-responsiveness of the 2021 Georgia Congressional Districting Plan.” *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO)*, 2022.
5. Z. Zhao and D. Randall. “A Heterogeneous Schelling Model for Wealth Disparity and its Effect on Segregation.” *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO)*, 2022.
6. H. Kedia, S. Oh, and D. Randall. “Local Stochastic Algorithms for Alignment in Self-Organizing Particle Systems. ” *International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM)*, 14:1-14:20, 2022.
7. D. Randall. “Statistical Physics and Algorithms.” *37th Symposium on the Theory of Computation (STACS)* 1:1-1:6, 2020.

8. M. Fahrbach and D. Randall. "Slow Mixing of Glauber Dynamics for the Six-Vortex Model in the Ordered Phases." *International Workshop on Randomization and Approximation Techniques in Computer Science* (RANDOM), 1-37:20, 2019.
9. S. Cannon, J.J. Daymude, C. Gökmen, D. Randall, A.W. Richa. "A Local Stochastic Algorithm for Separation in Heterogeneous Self-Organizing Particle Systems." *International Workshop on Randomization and Approximation Techniques in Computer Science* (RANDOM), 1-54:22, 2019.
10. D. Gillman and D. Randall. "Slow Convergence of Ising and Spin Glass Models with Well-Separated Frustrated Vertices." *Analysis of Algorithms* (AofA), **24**: 1–24, 2018.
11. S. Cannon, J.J. Daymude, C. Gökmen, D. Randall and A.W. Richa. "Brief Announcement: A Local Stochastic Algorithm for Separation in Heterogeneous Self-Organizing Particle Systems." *Principles of Distributed Computing* (PODC), 483-485, 2018.
12. M. Bernstein, M. Fahrbach and D. Randall. "Analyzing Boltzmann Samplers for Bose-Einstein Condensates with Dirichlet Generating Functions." *SIAM Workshop on Analytic Algorithms and Combinatorics* (ANALCO), 2018.
13. S. Cannon, J.J. Daymude, D.I. Goldman, Shengkai Li, D. Randall, A.W. Richa, W. Savoie and R. Warkentin. "Phototactic Supersmarticles." *Second International Symposium on Swarm Behavior and Bio-Inspired Robotics* (SWARM), Kyoto, Japan, October 2017.
14. M. Andrés Arroyo, S. Cannon, J.J. Daymude, D. Randall and A.W. Richa. "Local Stochastic Algorithms for Compression and Shortcut Bridging in Programmable Matter." *5th Workshop on Biological Distributed Algorithms* (BDA), 2017.
15. M. Andrés Arroyo, S. Cannon, J.J. Daymude, D. Randall and A.W. Richa. "A Stochastic Approach to Shortcut Bridging in Programmable Matter." *23rd International Conference on DNA Computing and Molecular Programming* (DNA), 122-138, 2017.
16. P. Bhakta, B. Cousins, M. Fahrbach and D. Randall. "Approximately Sampling Elements with Fixed Rank in Graded Posets." *27th ACM/SIAM Symposium on Discrete Algorithms* (SODA), Barcelona, Spain, 2017.
17. S. Cannon, J.J. Daymude, D. Randall and A. Richa. "A Markov Chain Algorithm for Compression in Self-Organizing Particle Systems." *Principles of Distributed Computing* (PODC), 279-288, 2016.
18. P. Bhakta and D. Randall. "Sampling Weighted Perfect Matchings on the Square-Octagon Lattice." *13th Workshop on Analytic Algorithmics and Combinatorics* (ANALCO), 46–55, 2016.
19. S. Cannon and D. Randall. "Sampling on Lattices with Free Boundary Conditions Using Randomized Extensions." *26th ACM/SIAM Symposium on Discrete Algorithms* (SODA), 1952–1971, 2016.
20. S. Cannon, S. Miracle and D. Randall. "Phase transitions in random dyadic tilings and rectangular dissections." *26th ACM/SIAM Symposium on Discrete Algorithms* (SODA), 2015.
21. P. Bhakta, S. Miracle and D. Randall. "Clustering and Mixing Times for Segregation Models on Z^2 ." *25th ACM/SIAM Symposium on Discrete Algorithms* (SODA), 2014.
22. A. Blanca, D. Galvin, D. Randall and P. Tetali. "Phase coexistence and slow mixing for the hard-core model on Z^2 ." *17th International Workshop on Randomization and Approximation Techniques in Computer Science* (RANDOM), 379–394, 2013.
23. S. Miracle and D. Randall. "Algorithms to Approximately Count and Sample Conforming Colorings of Graphs," *VII Latin-American Algorithms, Graphs and Optimization Symposium* (LAGOS), *Electronic Notes in Discrete Mathematics*, **44**: 225–231, 2013.

24. P. Bhakta, S. Miracle, D. Randall and A. Streib. “Mixing Times of Markov Chains for Self-Organizing Lists and Biased Permutations,” *24th ACM/SIAM Symposium on Discrete Algorithms (SODA)*, 1–15, 2013.
25. S. Miracle, D. Randall, A. Streib and P. Tetali. “Mixing times of Markov chains on 3-orientations of planar triangulations,” *23rd International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA)*, 2012.
26. S. Miracle, D. Randall and A. Streib. “Clustering in Interfering Models of Binary Mixtures,” *Proceedings of the 15th International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM)*, 652–663, 2011.
27. S. Miracle, D. Randall and A. Streib. “Cluster Algorithms for Discrete Models of Colloids with Bars,” *Proceedings of the Eighth Workshop on Analytic Algorithmics and Combinatorics (ANALCO)*, 135–149, 2011.
28. D. Randall. “Phase Transitions in Sampling Algorithms and the Underlying Random Structures,” *12th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT)*, 309–10, 2010.
29. I. Bezáková, N. Bhatnagar and D. Randall. “On the Diaconis-Gangolli Markov Chain for sampling contingency tables with cell-bounded entries,” *Proceedings of the 15th International Computing and Combinatorics Conference (COCOON)*, Niagara Falls, NY, July 2009.
30. A. Pascoe and D. Randall. “Self-assembly and Convergence Rates of Heterogenous Reversible Growth Processes,” *Proceedings of the 6th Annual Foundations of Nanoscience Conference (FNANO)*, Snowbird, Utah, April 2009.
31. S. Greenberg, A. Pascoe and D. Randall. “Sampling biased lattice configurations using exponential metrics,” *Proceedings of the 20th Symposium on Discrete Algorithms (SODA)*, 76–85, 2009.
32. N. Bhatnagar, S. Greenberg and D. Randall. “Sampling Stable Marriages: Why Spouse-Swapping Won’t Work,” *Proceedings of the 19th Symposium on Discrete Algorithms (SODA)*, 1223–1232, 2008.
33. S. Greenberg and D. Randall. “Slow Mixing of Markov Chains using Fault Lines and Fat Contours,” *Proceedings of the 11th International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM)*, 540–553, 2007.
34. D. Randall. “Markov Chain Convergence and the Efficiency of Some Self-Assembly Models,” *Proceedings of the 4th Annual Conference on Nanoscience (FNANO)*, 117–125, 2007.
35. D. Galvin and D. Randall. “Torpil Mixing of Local Markov Chains on 3-Colorings of the Discrete Torus,” *Proceedings of the 18th Symposium on Discrete Algorithms (SODA)*, 376–384, 2007.
36. N. Bhatnagar, S. Greenberg, D. Randall. “The Effects of Boundary Conditions on Mixing Rates of Markov Chains,” *Proceedings of the 10th International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM)*, 280–291, 2006.
37. R. D’Sousa, D. Galvin, C. Moore and D. Randall. “Global Connectivity from Local Geometric Constraints in Sensor Networks for many Wireless Footprints.” *5th International Conference on Information Processing in Sensor Networks (IPSN)*, 19–26, 2006.
38. N. Bhatnagar, D. Randall, V. Vazirani, E. Vigoda. “Random Bichromatic Matchings.” *11th Latin American Theoretical Informatics (LATIN)*, 190–201, 2006.
39. D. Randall. “Slow Mixing of Glauber Dynamics via Topological Obstructions.” *Proceedings on the 17th Symposium of Discrete Algorithms (SODA)*, 870–879, 2006.

40. D. Randall and P. Winkler. "Mixing Points on a Circle." *Proceedings of the 9th International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM)*, 426–435, 2005.
41. M. Cryan, M. Dyer, and D. Randall. "Approximately counting integral flows and cell-bounded contingency tables." *37th ACM Symposium on Theory of Computing (STOC)*, 413–422, 2005.
42. D. Randall and P. Winkler. "Mixing Points on an Interval." *Second Workshop on Analytic Algorithmics and Combinatorics (ANALCO)*, 218–221, 2005.
43. N. Bhatnagar and D. Randall. "Torpид Mixing of Simulated Tempering on the Potts Model." *Proceedings of the 15th Symposium of Discrete Algorithms (SODA)*, 478–487, 2004.
44. D. Randall. "Mixing." *44th IEEE Symposium on Foundations of Computer Science (FOCS)*, 4–15, 2003.
45. D. Randall, G. Rote, F. Santos, and J. Snoeyink. "Counting Triangulations and Pseudotriangulations of Wheels." *Proceedings of the 13th Canadian Conference on Computational Geometry (CCCG)*, 149–152, 2001.
46. D. Randall. "Decomposition Methods and Sampling Circuits in the Cartesian Lattice." *Proceedings of the 5th Symposium on Mathematical Foundations of Computer Science (MFCS)* in *Lecture Notes in Computer Science, Vol. 1256* (J. Sgall, A. Pultr, and P. Kolman, editors), 72–84, 2001.
47. A. Karlin, C. Kenyon, and D. Randall. "Dynamic TCP Acknowledgement and Other Stories About $e/(1-e)$." *Proceedings of the 31st ACM Symposium on Theoretical Computer Science (STOC)*, 502–509, 2001.
48. R. Martin and D. Randall. "Sampling adsorbing staircase walks using a new Markov chain decomposition method." *Proceedings of the 41st IEEE Symposium on Foundations of Computer Science (FOCS)*, 492–502, 2000.
49. D. Randall and G. Yngve. "Random Three-dimensional Tilings of Aztec Octahedra and Tetrahedra: An Extension of Domino Tilings." *Proceedings of the 11th ACM/SIAM Symposium on Discrete Algorithms (SODA)*, 320–329, 2000.
50. R. Martin and D. Randall. "Pfaffian Algorithms for Sampling Routings on Regions with Free Boundary Conditions." *Proceedings of the 3rd International Workshop on Randomization and Approximation Techniques in Computer Science (RANDOM)* in *Lecture Notes in Computer Science, 1671*, 257–268, 1999.
51. D. Randall and D. B. Wilson. "Sampling Spin Configurations of an Ising System." *Proceedings of the 10th ACM/SIAM Symposium on Discrete Algorithms (SODA)*, 959–960, 1999.
52. D. Randall and P. Tetali. "Analyzing Glauber Dynamics by Comparison of Markov Chains." *Proceedings of the 3rd Latin American Theoretical Informatics (LATIN)*, in *Lecture Notes in Computer Science, 1380* (C. L. Lucchesi and A. V. Moura, editors), 292–304, 1998.
53. N. Madras and D. Randall. "Factoring Graphs to Bound Mixing Rates." *Proceedings of the 37th IEEE Symposium on Foundations of Computer Science (FOCS)*, 194–203, 1996.
54. M. Luby, D. Randall, and A. J. Sinclair. "Markov Chain Algorithms for Planar Lattice Structures." *Proceedings of the 36th IEEE Symposium on Foundations of Computer Science (FOCS)*, 150–159, 1995.
55. D. Randall and A. J. Sinclair. "Testable Algorithms for Self-Avoiding Walks." *Proceedings of the 5th ACM / SIAM Symposium on Discrete Algorithms (SODA)*, 593–602, 1994.
56. C. Kenyon, D. Randall, and A. J. Sinclair. "Matchings in Lattice Graphs." *Proceedings of the 25th ACM Symposium on Theoretical Computer Science (STOC)*, 738–746, 1993.

E.3. Conference Presentations without Proceedings

1. “Random tilings of Aztec octahedra and tetrahedra,” *Conference on Random Structures and Algorithms*, Poznan, Poland, August 1999.
2. “Markov chain algorithms for planar lattice structures,” *Conference on Random Structures and Algorithms*, Emory University, Atlanta, GA, April 1995.

F. Other

F.1. Submitted Journal Papers

1. J. Calvert and D. Randall, “Local–global correlations of dynamics on disordered energy landscapes.” Submitted, 2025.
2. J. Calvert, F. den Hollander and D. Randall, “A Note on the Asymptotic Uniformity of Markov Chains with Random Rates.” Submitted, 2025.
3. S. Cannon, M. Duchin, D. Randall, P. Rule, “Spanning Trees and Political Redistricting.” Submitted, 2024.

F.2. Submitted Conference Papers

1. S. Oh, J. Calvert and D. Randall, “The Geometry of Fixed-Magnetization Spin Systems at Low Temperature.” Submitted, 2025.
2. D. Gillman, J. Platnick and D. Randall, “Splittable Spanning Trees and Balanced Forests in Dense Random Graphs.” Submitted, 2025.

F.3. Book Reviews

1. D. Randall. “Summing up a Set of Inspirational Female Figures,” Book review of “Complexities: Women in Mathematics.” *Times Higher Education Supplement (THES)*, September 2, 2005.

G. Research Proposals and Grants (Principal Investigator)

G.1. Approved and Funded

1. Collaborative Research: AF: Medium: Markov Chain Algorithms for Problems from Computer Science, Statistical Physics and Self-Organizing Particle Systems.
P.I.: D. Randall, co-P.I.: Andrea Richa (Arizona State University).
NSF, Amount funded: \$1.2M (\$700,000 to Georgia Tech), 2021-2026.
2. Foundations of Algorithmic Matter and Emergent Computation.
P.I.: D. Randall; Co-P.I.s: D. Goldman (GT), A. Richa (ASU), Jeremy England, Michael Strano (MIT), Todd Murphey (NWU).
ARO, Amount funded: \$6.25M, (\$2.9M to Georgia Tech), 2019-2025.

3. TRIPODS+X: VIS: Creating an Annual Data Science Forum.
P.I.: D. Randall (GT); Co-P.I.s: S. Aluru (GT), J. Wing (Columbia University), N. Washburn (CMU).
NSF, Amount funded: \$200,000, 2018-20.
4. Conference: Machine Learning in Science and Engineering.
P.I.: Dana Randall (GT), co-PI: Newell Washburn (CMU).
NSF, Amount funded: \$30,000, 2018.
5. AitF: Collaborative Research: Distributed and Stochastic Algorithms for Active Matter: Theory and Practice.
P.I.: D. Randall (Georgia Tech), co-P.I.s: Daniel Goldman (GT) and A. Richa (ASU).
NSF, Amount funded: \$616,000 (\$408,000 to Georgia Tech), 2017-2021.
6. AitF: Collaborative Research: A Distributed and Stochastic Algorithmic Framework for Active Matter.
P.I.: D. Randall (Georgia Tech), co-P.I.s: Daniel Goldman (GT) and A. Richa (ASU).
NSF, Amount funded: \$300,000 (\$200,000 to Georgia Tech), 2016-2019.
7. Markov Chain Algorithms for Problems from Computer Science and Statistical Physics.
NSF CCF grant
P.I.: D. Randall.
NSF, Amount funded: \$400,000, 2015–2019.
8. Markov Chain Algorithms for Problems from Computer Science, Statistical Physics and Economics.
NSF CCF-1219020
P.I.: D. Randall.
NSF, Amount funded: \$279,000, 2012 – 2015.
9. Markov Chain Algorithms for Problems from Computer Science and Statistical Physics.
NSF CCR Grant
P.I.: D. Randall.
NSF, Amount funded: \$300,000, 2008 – 2012.
10. Analysis of Markov Chains and Algorithms for Ad-Hoc Networks.
NSF CCR Grant
P.I.: D. Randall/
NSF, Amount funded: \$200,000, 2005 – 2008.
11. Markov Chain Algorithms for Problems from Computer Science and Statistical Physics.
NSF DMS Grant
P.I.: D. Randall.
NSF, Amount funded: \$180,000, 2005 – 2008.

12. Randomized Algorithms for Problems in Combinatorics and Statistical Physics.
IBM Faculty Partnership Award.
P.I.: D. Randall.
NSF, Amount funded: \$20,000, 2002–2003.
13. Markov Chain Algorithms for Combinatorial Problems from Statistical Physics and Biology.
P.I.: D. Randall.
NSF, Amount funded: \$220,000, 2001 – 2005.
14. Alfred P. Sloan Research Fellowship.
P.I.: D. Randall.
Sloan Foundation, Amount funded: \$40,000, 2001 – 2003.
15. Randomness, Approximation and New Models of Computation.
US-France Cooperative NSF/CNRS Research Proposal
For collaboration between the theory groups in Georgia Tech and Orsay, France.
P.I.: D. Randall, Co-P.I.: L. Schulman and V. Vazirani.
NSF, Amount funded: \$21,000, 2000 – 2003.
16. Markov Chain Algorithms for Combinatorial Problems from Statistical Physics.
National Science Foundation Faculty Early Career Development (CAREER).
P.I.: D. Randall.
NSF, Amount funded: \$200,000, 1997 – 2001

H. Research Proposals and Grants (Contributor)

H.1. Approved and Funded

1. Principles of swarm assembly of adaptable structures from amorphous materials.
PI: Daniel Goldman; Co-PIs: D. Frost, C. Arson, L. Stewart, M. Goodisman, D. Randall.
Moving Forward Grant from Georgia Tech.
Amount funded \$100,000, 2022-23.
2. TRIPODS: Transdisciplinary Research Institute for Advancing Data Science (TRIAD).
NSF CCF-1740776.
P.I.: X. Huo, co-P.I.s: S. Aluru, D. Randall, P. Tetali, J. Wu.
Amount funded: \$1,500,000, 2017–2020
3. EAGER: A Mathematical Model of Privacy Decisions: A Behavioral Economic Perspective.
NSF CNS-1544090.
P.I.: F. Farahmand, co-P.I.s: D. Randall, T. Besedes.
Amount funded: \$275,769, 2015–2017

4. Random Processes and Randomized Algorithms
National Science Foundation, CISE.
P.I.: S. Vempala, co-P.I.s: D. Randall, D. Štefankovič, P. Tetali, E. Vigoda.
Amount funded: \$1.2M, 2009-2012.
5. DIMACS/Georgia Tech Special Focus on Discrete Random Systems.
National Science Foundation, Probability Division.
P.I.: F. Roberts, co-P.I.s: D. Randall and G. Sorkin.
Amount funded: \$192,000, 2006 – 2008.
6. IAS/DIMACS Workshop Funding
NSF Grant No.9617148.
P.I.: F. Roberts, co-P.I.: J. T. Chayes and D. Randall.
Amount funded: \$13,000, 1997.
7. IAS/DIMACS Workshop Funding.
NSA Grant
P.I.: F. Roberts, co-P.I.: J. T. Chayes and D. Randall.
Amount funded: \$4,500, 1997.

II. TEACHING

A. Courses Taught

<u>Semester/Yr</u>	<u>Course</u>	<u>Number of Students</u>	<u>Comments</u>
Fall 2024	CS 4540 Adanced Algorithms	42	
Spring 2024	CS 4540 Advanced Algorithms	46	
Spring 2023	CS 7535 Markov Chain Monte Carlo	14	
Fall 2022	CS 3510 Algorithms	250	
Spring 2022	CS 3510 Algorithms	200	
Spring 2021	CS 2050 Discrete Mathematics for CS	270	(with Brito)
Spring 2020	CS 8803 Markov Chains and Emergence	10	New
Fall 2018	CS 3510 Algorithms	172	
Spring 2018	CS 2051 Discrete Math for CS	50	Honors
Spring 2017	CS 2051 Discrete Math for CS	54	Honors
Fall 2015	CS 4540 Advanced Algorithms	36	
Fall 2014	CS 7535 Markov Chains	16	
Spring 2014	CS 2051 Discrete Math for CS	48	Honors
Spring 2013	CS 2051 Discrete Math for CS	25	Honors
Fall 2012	CS 4540 Advanced Algorithms	28	
Fall 2011	CS 4540 Advanced Algorithms	16	
Spring 2011	CS 3510 Algorithms	40	
Spring 2011	CS 3511 Honors Algorithms	10	
Spring 2010	CS 8803 Markov Chain Monte Carlo Methods	14	
Fall 2009	CS 6550 Design & Analysis of Algs	24	
Spring 2009	CS 3510 Algorithms	55	with Honors
Spring 2009	CS 3511 Honors Algorithms	9	

<u>Semester/Yr</u>	<u>Course</u>	<u>Number of Students</u>	<u>Comments</u>
Fall 2007	CS 6550 Design & Analysis of Algs	25	
Fall 2006	CS 6550 Design & Analysis of Algs	21	
Spring 2006	CS 3510 Algorithms	10	Honors
Fall 2005	CS 6550 Design & Analysis of Algs	27	
Spring 2005	CS 3510 Theory I: Algorithms	15	Honors/New
Fall 2004	CS 1050 Understanding and Constructing Proofs	45	
Fall 2004	CS 7530 Randomized Algorithms	15	
Spring 2004	CS 8801 Mixing Rates of Markov Chains	11	New
Fall 2003	CS 3500 Theory I	106	(with Mihail)
Spring 2003	CS 4500 Theory II	15	Revised
Fall 2001	CS 3500 Theory I	64	
Spring 2001	CS 7530 Randomized Algorithms	10	Revised
Fall 2000	Math 3012 Combinatorics	34	
Spring 2000	CS 1050 Understanding and Constructing Proofs	40	Honors
Fall 1999	CS 6550 Algorithms (Ph.D. level)	29	
Spring 1999	CS 3156 Formal Languages	50	
	CS 3156 Formal Languages	35	
Winter 1999	Math 8223 Combinatorial Methods for Stat. Phys. Models	8	New
Fall 1998	Math 3012 Combinatorics	37	
	Math 4800 Monte Carlo Algorithms in Combinatorics	4	New
Spring 1998	CS 1155 Understanding and Constructing Proofs	60	
	Math 3012 Combinatorics	35	
Winter 1998	Math 2503 Algorithms and Optimization	32	
Spring 1997	CS 1155 Understanding and Constructing Proofs	60	
Winter 1997	Math 3012 Combinatorics	36	
Fall 1996	Math 1507 Calculus I	47	
	Math 8213 Rapidly Mixing Markov Chains	7	New

B. Individual Student Guidance

1. Postdoctoral Scholar Supervised:

Jacob Calvert: 2023–present.

Hriday Kedia: 2020–2022 (joint with Daniel Goldman).

Ram Avinery: 2020–2021 (joint with Daniel Goldman).

Charilaos Efthymiou: 2014–2016 (joint with Eric Vigoda).

Ravi Montenegro: 2002–2005 (joint with Prasad Tetali).

2. Ph.D. Students Supervised:

Jacob Platnick: Ph.D. expected 2029.
Shunhao Oh: Ph.D. received 2025.
Zhanzhan Zhao: Ph.D. received 2023.
Bahnisikha Dutta: Ph.D. received 2021 (co-advised by Magnus Egerstedt).
Matthew Fahrback: Ph.D. received 2019.
Sarah Cannon: Ph.D. received 2018/
Prateek Bhakta: Ph.D. received 2016.
Sarah Miracle: Ph.D. received 2015.
Amanda Pascoe Streib: Ph.D. received 2012.
Sam Greenberg: Ph.D. received 2008.
Nayantara Bhatnagar: Ph.D. received 2007 (co-advised by Eric Vigoda).
Russell Martin: Ph.D. received 2001.

3. Masters Students Supervised:

Ryan Johnston: Spring 2002–2005.

4. Undergraduate Students Supervised:

Noah Egan: 2021–2024.
Cem Gokmen: 2017–2019.
Marta Andrés Arroyo: Summer 2016.
Kevin Han: 2015–2016.
Suvrat Bhooshan: 2015–2016.
Ryan Keane: 2013–2016.
Jeff Yunes: Spring 2005
Blair Dowling: Fall 2002–Summer 2004.
Danielle Dees: 2001–2002.
Nitesh Singh: Spring 2001.
Gary Yngve: 1998–1999.
Kevin Gay: 1998–1999.

C. Teaching Honors and Awards

The William A. “Gus” Baird Faculty Teaching Award, 2015.

Class of 1940 Course Survey Teaching Effectiveness Award, 2014.

CETL “Thank a Teacher Program” Certificates: 2008, 2009, 2010, 2011, 2015, 2016, 2017, 2018, 2022, 2024.

The William A. “Gus” Baird Faculty Teaching Award, College of Computing, 2000.

III. SERVICE

A. National / International Committees for Professional Societies

AMS Committee on Science Policy (CSP), 2025–present.

Chair, SIAM Activity Group on Discrete Mathematics, 2022–2024 (elected).

Scientific Advisory Board, Institute for Computational and Experimental Research in Mathematics (ICERM), 2022–2025.

Knuth Prize Selection Committee, ACM SIGACT, 2021–2023 (Chair 2022).

External Advisory Board for the Rutgers TRIPODS center, 2019–2022.

External Advisory Board for the Tufts TRIPODS center, 2019–2022.

AMS Joan and Joseph Birman Fellowship for Women Scholars, Chair of the Selection Committee, 2017–19.

International Scientific Advisory Committee, Centre de Recherches Mathématiques, Montreal, Canada, 2015–present.

External Advisory Board, Center for the Science of Information (CSoI), Purdue University, 2015–present.

CRA Committee for the Advancement of Theoretical Computer Science (CATCS), 2013–present.

Steering Committee for the Symposium of Discrete Algorithms (SODA), 2012–present.

AMS Editorial Committee, 2012–2015 (elected through a national vote).

Board of Governors, Institute for Mathematics and its Applications (IMA), 2010–14. Chair of the Board 2013–14.

AMS Program Committee for National Meetings, 2007–2011 (Chair 2011).

Executive Committee and DIMACS Council, Center for Discrete Mathematics and Theoretical Computer Science, 2005–present.

Co-Chair, Planning Committee, Japanese-American Frontiers of Science Symposium. Sponsored by the National Academy of Sciences (NAS) and the Japan Society for the Promotion of Science (JSPS), Irvine, CA, December 2006.

Member, Planning Committee, Japanese-American Frontiers of Science Symposium. Sponsored by the National Academy of Sciences (NAS) and the Japan Society for the Promotion of Science (JSPS), Shonan Village, Japan, December 2005.

B. Editorial Boards for Journals and Publications

Editor for ACM/SAGE journal *Collective Intelligence*, 2021–present.

Editor for *Annales de L’Institut Henri Poincaré D: Combinatorics, Physics and their Interactions*, 2019–present.

Editor for *the Theory of Computing*, 2004 – present.

Associate Editor for *the SIAM Journal on Discrete Mathematics*, 2007–14.

Associate Editor for *the Annals of Applied Probability*, 2002 – 2005.

Guest editor for special issue of *Transactions on Algorithms* based on the best papers from the 2011 ACM-SIAM Symposium on Discrete Algorithms, (with S. Chawla and P. Ragavendra), 2013.

Editor of the *Proceedings of the 22nd ACM/SIAM Symposium on Discrete Algorithms (SODA)*, San Francisco, CA, 2011.

Guest editor for special issue of *Random Structures and Algorithms* on “Statistical physics methods in discrete probability, combinatorics and theoretical computer science,” (with J. T. Chayes), Volume 15, Issues 3–4, October-December 1999.

C. Conference Committee Activities

Organizing Committee, Introductory Workshop for the special semester on Probability and Statistics of Discrete Structures, SLMath, January 2025.

Organizing Committee, Connections for Women Workshop for the special semester Probability and Statistics of Discrete Structures, SLMath, January 2025.

Organizing Committee, Simons-Laufer Mathematical Sciences Institute (SLMath) special semester on “Probability and Statistics of Discrete Structures,” Spring 2025.

Program Committee, *15th Innovations in Theoretical Computer Science (ITCS)*, Berkeley, CA, January 2024.

Organizing Committee, Introductory Workshop for the MSRI special semester on Fairness, Equity and Algorithms, upcoming August 2023.

Organizing Committee, 3rd Symposium on Machine Learning in Science and Engineering, Columbia University, June 2020.

Chair of the Organizing Committee, 2nd Symposium on Machine Learning in Science and Engineering, Georgia Tech, June 2019.

Co-Chair of the Organizing Committee (with N. Washburn), CMU-GT Symposium on Machine Learning in Science and Engineering, Pittsburgh, PA, upcoming June 2018.

Special Session Co-Organizer (with A.W. Richa), AMS/MAA National Joint Mathematics Meetings, on “Emergent Phenomena in Discrete Models,” San Diego, CA, upcoming January 2018.

Program Committee, *SIAM Workshop on Analytic Algorithms and Combinatorics (ANALCO)*, Barcelona, Spain, January 2017.

Co-Chair of the Program Committee (with Henry Cohn), *SIAM Conference on Discrete Mathematics*, July 2016.

Co-organizer (with P. Tetali, S Vempala and E. Vigoda) IMA / Georgia Tech Workshop on te Power of Randomness in Cmoputation, Atlanta, GA, March 2015.

Program Committee, *4th Biennial Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM)*, June 2013.

Co-organizer (with P. Tetali and E. Vigoda) Workshop on Computation and Phase Transitions, Atlanta, GA, June 2012.

Co-organizer (with B. de Tiliere and C. Soteros) MSRI workshop on Connections for Women: Discrete Lattice Models in Mathematics, Physics, and Computing, Berkeley, CA, January 2012.

Program Committee, *SIAM Workshop on Analytic Algorithms and Combinatorics (ANALCO)*, Kyoto, Japan, January 2012.

Chair of the Program Committee, *22nd ACM/SIAM Symposium on Discrete Algorithms (SODA)*, San Francisco, CA, January 2011.

Chair of the AMS Program Committee for National Meetings, *Joint Mathematics Meetings*, member 2008-11 New Orleans, LA, January 2011.

Co-organizer (with F. Martinelli and P. Tetali), DIMACS / Georgia Tech Working Group on ”Analysis of Markov Chains on Combinatorial and Statistical Mechanics Models,” Atlanta, GA, June 2009.

Program Committee, *13th Conference on Randomization and Approximation Techniques in Computer Science (RANDOM)*, Berkeley CA, August 2009.

Co-organizer (with G. Brightwell and W.T. Trotter), DIMACS / Georgia Tech Workshop on “Puzzling Mathematics and Mathematical Puzzles,” June 2007.

Co-organizer (with E. Vigoda), DIMACS / Georgia Tech Working Group on “Phase transitions and Markov chains,” March 2007.

Organizer, Kickoff Workshop for DIMACS / Georgia Tech Special Focus in “Discrete Random Systems,” November 2006.

Program Committee, *47th IEEE Symposium on Foundations of Computer Science (FOCS)*, Berkeley, CA, October 2006.

Co-Chair, Organizing Committee (with G. Sorkin), DIMACS three year special focus on “Discrete Random Models,” 2006 – 2008.

Organizing Committee and Session Organizer, *Fifth Symposium on Probability and its Applications*, Rio de Janeiro, August 2006.

Program Committee, *9th Conference on Randomization and Approximation Techniques in Computer Science (RANDOM)*, Berkeley, CA, August 2005.

Program Committee, *International Conference on the Analysis of Algorithms (AofA)*, Barcelona, June 2005.

Program Committee, *16th ACM/SIAM Symposium on Discrete Algorithms (SODA)*, Vancouver, CA, January 2005.

Session Organizer and Organizing Committee, *6th World Congress of the Bernoulli Society for Mathematical Statistics and Probability*, Special Session on Mixing of Finite Markov Chains, Barcelona, Spain, July 2004.

Program Committee, *44th IEEE Symposium on Foundations of Computer Science (FOCS)*, Boston, MA, October 2003.

Program Committee, *7th Conference on Randomization and Approximation Techniques in Computer Science (RANDOM)*, Princeton, NJ, August 2003.

Session Co-Organizer (with C. Moore), AMS/MAA National Joint Mathematics Meetings, Special Session on “Discrete Models,” Baltimore, MD, January 2003.

Program Committee, *13th ACM/SIAM Symposium on Discrete Algorithms (SODA)*, San Francisco, CA, January 2002.

Program Committee, *5th Conference on Randomization and Approximation Techniques in Computer Science (RANDOM)*, Berkeley, CA, August 2001.

Session Organizer, *17th International Symposium on Mathematical Programming (ISMP)*, Special session on Approximate Counting and Sampling, Atlanta, August 2000.

Program Committee, *40th IEEE Symposium on Foundations of Computer Science (FOCS)*, New York, NY, October 1999.

Co-Organizer (with P. Tetali), SAAC/ACO/DIMACS Workshop on “Combinatorial Methods for Statistical Physics Models,” (as part of the 1998-1999 special year in Combinatorics in the School of Mathematics at Georgia Tech), Atlanta, GA, April 1999.

Program Committee, *10th ACM/SIAM Symposium on Discrete Algorithms (SODA)*, Baltimore, MD, January 1999.

Co-Organizer (with J. T. Chayes), IAS/DIMACS Workshop on “Statistical Physics Methods in Discrete Probability, Combinatorics and Theoretical Computer Science,” Institute for Advanced Study and Rutgers University, NJ, March 1997.

D. On-Campus Georgia Tech Committees

Awards Committee, SCS, 2024-present.

Co-chair of the Impacts of COVID19 on Faculty Working Group: 2021–22, Member 2022-23.

Georgia Tech Diversity, Equity and Inclusion Council, 2020–2021.

Faculty Recruiting Committee, School of Computer Science: 2021–22.

Computer Science School Advisory Committee (SAC), 2020–23.

Vice President of Interdisc. Research (VPIR) Search Committee: 2020–21.

Chair, Theory Recruiting Committee (TRC), School of Computer Science, 2019–2020.

AI Task Force, 2019–2021

Executive Vice President for Research search committee, 2018.

Machine Learning Center Internal Advisory Council, 2017–present.

Health Analytics Council, 2017–present.

Strategic Energy Institute Faculty Council, 2016–present.

Emerging Leadership Program steering committee, 2016–present.

Interdisciplinary Programs Council, 2016–present.

Co-chair, Coda HPC Building Faculty Shepherding Committee, 2015–present.

Co-chair, Faculty Council for Data Science and Engineering, 2014–17.

Task Force on Promotion and Tenure, Institute Committee, 2013.

Chair, College of Computing Reappointment, Promotion and Tenure committee, 2012–14.

ADVANCE Professor of Computing, 2011–present, Chair 2012–14, 2017.

Algorithms and Randomness Center graduate fellowship selection committee, 2011–12.

Chair, Search Committee for the Chair of the School of Interactive Computing, College of Computing, 2011.

Vice President for Institute Diversity search committee, 2010.

Coordinating the mentoring program for junior faculty, School of Computer Science, 2009–present.

Faculty Status and Grievance Committee, Institute Committee, 2007–2010.

Theory Area Coordinator, School of Computer Science, 2007–2012.

Women’s Resource Center Advisory Board, Institute Committee, 2006–2011.

Steering Committee for the Algorithms, Combinatorics, and Optimization (ACO) program, 2003–present.

Dean’s Five Year Review, Provost Appointed Committee, 2007–2008.

Chair, Search Committee for ACO Director, 2006.

Women’s Recruitment Advisory Board (WRAB), Institute Committee, 2004–2006.

Steering Committee for the Core Computing Division, 2003–2005.

ADVANCE Committee for RPT Assessment, Institute Committee, 2002–2003.

Graduate Student Recruiting, Committee Chair, College of Computing, 2002–2003.

Undergraduate Curriculum Committee, College of Computing, 2001–2002.

Faculty advisor to the Georgia Tech juggling club, 2001–2005.

Graduate Faculty Assembly, College of Computing, 2001–2002.

Chair Search Committee for the School of Mathematics, 2000–2002.

Graduate Committee, College of Computing, 1999–2000.

Stelson Lecturer Committee, School of Mathematics, 1998–2001 (Chair 2000–2001).

Undergraduate Research Opportunities in Computing (UROC) Committee, College of Computing, 1998–1999.

Elections Committee, School of Mathematics, 1998–1999.

Graduate Committee, School of Mathematics, 1997–1999.

E. Additional Honors and Awards

Mentoring Award, College of Computing, 2017.

Dean’s Award, College of Computing, 2012 and 2016.

Outstanding Service Award, Georgia Tech, 2013.

Outstanding Senior Faculty Research Award, College of Computing, Georgia Tech, 2006.

University of California Presidential Dissertation Year Fellowship, 1993–1994.

IV. INVITED TALKS AND ACTIVITIES

A. Talks at Meetings and Symposia

“Emergent phenomena in equilibrium and nonequilibrium collectives.” 2nd Workshop on Stochastic Thermodynamics and Computer Science, June 2025, Santa Fe Institute, Santa Fe, NM.

“Emergent Computation in Equilibrium and Nonequilibrium Collectives.” American Physics Society (APS) Global Physics Summit, March 2025.

“Emergent Computation in Equilibrium and Nonequilibrium Collectives.” Workshop on Frontiers of Statistical Physics and Theoretical Computer Science, Banff, AB, Canada, August 2024.

“Emergent Computation and Foundations of Programmable Matter.” 30th workshop for Women in Probability, Chapel Hill, NC, August 2024.

Plenary Talk. ACM-SIAM Symposium on Discrete Algorithms (SODA), January 2024, Alexandria, VA.

“Inspiration Talk” at the Research Spotlight Workshop at the 55th ACM Symposium on Theory of Computing (STOC), June 2023, Orlando, FL.

“Phase Transitions and Emergent Phenomena in Algorithms and Applications.” Workshop on From Local to Global Information, Honolulu, HI, February 2020.

Plenary Talk. 37th Symposium on Theoretical Aspects of Computing (STACS), Montpellier, France, March 2020 (cancelled due to COVID-19).

“Phase Transitions and Emergent Phenomena in Algorithms and Applications,” Three Decades of DIMACS: the Journey Continues, November 2019.

Birnbaum Lecture, Pacific Northwest Probability Meeting, September 2019.

Plenary Talk. 25th International Conference on DNA Computing and Molecular Programming (DNA), Seattle, WA August 2019.

Plenary Talk. 30th International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA), Luminy, France, June 2019.

“Phase transitions in programmable active matter.” Workshop on Emergent Algorithms and Network Dynamics (WENDY), Paris, France, October 2018.

AMS Invited (Keynote) Address. Joint Mathematics Meetings, San Diego, CA, January 2018.

“Sampling Algorithms for Generating Random Tilings.” A 5 hour short course at the summer school on *Transverse Aspects of Tilings*, Île d’Oléron, France, June 2016.

“Uniformly generating integer partitions with Markov chains.” Approximate Counting, Markov Chains and Phase Transitions, February 2016.

“Phase transitions in random tilings.” 12th Triangle Lectures in Combinatorics, October 2015.

“Slow mixing and non-uniqueness for the hard-core model on \mathbf{Z}^2 .” SIAM Discrete Mathematics Minisymposium on Combinatorics and Statistical Mechanics, June 2014.

“Sampling biased permutations and lattice structures.” Workshop on phase transitions in discrete structures and computational problems, Warwick, UK, May 2014.

“Slow mixing for the hard-core model on \mathbf{Z}^2 .” Workshop on Performance Analysis of Monte Carlo Methods, November 2012.

“Colloids, lattice gasses, and other models with hard constraints.” Workshop on Percolation and Interacting Systems, February 2012.

“Sampling and counting in lattices: the Computer Science Perspective.” Invited tutorial in the Connections for Women: Discrete Lattice Models in Mathematics, Physics and Computing Workshop, MSRI, Berkeley, CA, January 2012.

“Discrete models of colloids.” SIAM annual meeting, Probabilistic Combinatorics and Algorithms Minisymposium, Pittsburgh, PA, July 2010.

“Algorithms for sampling: learning from physics and computing.” Women in Theory 2010, Princeton, NJ, June 2010.

“Random Sampling, Random Surfaces and Self-assembly.” ARC2: Georgia Tech Algorithms and Randomness Center Second Anniversary Meeting, Atlanta, GA, October 2009.

“Mixing times of local Markov chains on biased lattice configurations.” 100th Statistical Mechanics Conference, Rutgers, NJ, December 2008.

“Slow Mixing of Local Markov Chains via Topological Obstructions,” International Conference on Interdisciplinary Mathematical and Statistical Techniques, Memphis, TN, May 2008.

“Proving Slow Mixing with Fault Lines and Fat Contours,” Workshop on Markov Chain Monte Carlo Methods, Newton Institute for Mathematical Sciences, Cambridge, UK, March 2008.

“Slow Mixing of Glauber Dynamics and Simulated Tempering Algorithms,” DIMACS workshop on “Markov Chain Monte Carlo: Synthesizing Theory and Practice,” Rutgers, June 2007.

“Slow Mixing of Glauber Dynamics via Topological Obstructions,” *69th Annual Meeting of the Institute of Mathematical Statistics*, Rio de Janeiro, Brazil, August 2006.

“Slow Mixing of Local Dynamics via Topological Obstructions,” DIMACS / DIMATIA / Renyi Combinatorial Challenges Meeting, Rutgers, April 2006.

“Slow Mixing of Markov Chains via Topological Obstructions,” *21st Annual Discrete Mathematics Workshop*, Clemson University, Clemson, SC, October 2005.

“Slow Mixing of Markov Chains via Topological Obstructions,” *Workshop on New Perspectives on Complex Systems*, Santa Fe Institute, Santa Fe, NM, July 2005.

“Mixing Points on an Interval,” *ARCC Workshop on Sharp Thresholds for Mixing Times*, Palo Alto, CA, December 2004.

“Two Results on Slow Mixing,” *Workshop on Finite Markov Chains and Random Algorithms*, Cornell University, Ithaca, NY, May 2004.

“Random Dyadic Tilings of the Unit Square,” *Workshop on Randomized Algorithms*, Newton Institute, Cambridge, England, August 2002.

“Simulated Tempering: Fast or Slow,” *Workshop on Randomized Graphs and Algorithms*, Bertinoro, Italy, May 2002.

“Simulated Tempering: Fast or Slow,” *AMS Southeastern Section Meeting*, Georgia Tech, Atlanta, March 2002.

“Random Dyadic Tilings of the Unit Square,” *Probability Conference in Honor of David Blackwell and Lester Dubins*, U.C Berkeley, February 2002.

“Simulated Tempering: Fast or slow,” *AMS National Meeting*, San Diego, January 2002.

“Decomposition, swapping and mean-field models,” *Dagstuhl seminar on Design and Analysis of Randomized and Approximation Algorithms*, Dagstuhl, Germany, June 2001.

“Glauber dynamics in one dimension,” *17th International Symposium on Mathematical Programming (ISMP 2000)*, Atlanta, GA, August 2000.

“Sampling adsorbing staircase walks using a new decomposition method,” *Workshop on Probability Theory, Phase Transitions and Computational Complexity*, Cortona, Italy, June 2000.

“Sampling lattice structures on regions with free and periodic boundary conditions,” *1999 SIAM Annual Meeting*, Atlanta GA, May 1999.

“Random three-dimensional tilings: an extension of domino tilings,” *AMS 1999 Southeastern section meeting*, Charlotte NC, September 1999.

“Sampling problems from Statistical Physics,” *DIMACS-CMU-Georgia Tech Workshop on Large Scale Discrete Optimization*, Rutgers University, May 1998.

“Two-dimensional tilings in two and three dimensions,” *Combinatorialists of New England (CoNE)*, Northampton, MA, February 1998.

“Guarantees for efficiently sampling lattice configurations,” *DIMACS/IAS Workshop on Microsurveys in Discrete Probability*, Institute for Advanced Study, Princeton, NJ, June 1997.

“Markov chain algorithms for planar lattice structures,” *12th Annual Discrete Mathematics Workshop*, Clemson University, Clemson, SC, October 1996.

“Markov chains for generating combinatorial structures,” *Workshop on Randomness and Computation*, Berkeley, CA, December 1995.

“Generating colorings by decomposing Markov chains,” *Workshop on Discrete Isoperimetric Inequalities*, Institute for Advanced Study, Princeton, NJ, November 1995.

“Generating self-avoiding walks,” *Edinburgh Workshop on Randomness and Computation*, University of Edinburgh, Edinburgh, Scotland, July 1993.

B. Invited Seminars and Colloquia (partial list)

Computer Science Colloquia:

Purdue University, 2015, Microsoft Research New England, 2013, Santa Fe Institute, 2008, University of Virginia, 2001, U.T. Austin, 1997, MIT, 1994, Princeton, 1994.

Mathematics Colloquia:

Texas A& M, 2022, University of Delaware, 2012, U.C. Berkeley / MSRI, 2012, Northwestern University, 2005, IBM Watson Research Center, 1998, University of Michigan, 1996, AT&T Bell Laboratories, 1994.

Theoretical Computer Science Seminars:

U.T. Austin, 2022, North Carolina State University, 2015, Harvard University, 2005, 1994, University of Pennsylvania, 2003, University of Washington, 2001, 1997, Microsoft Research, Redmond, 2001, 2000, 1998, Princeton University, 1996, University of Maryland, 1996, Freie University, Berlin, Germany, 1995, Ecole Normale Supérieure, Paris, France, 1995, University Paris-Sud, Orsay, France, 1995, Cornell University, 1995, NYU, 1994, Columbia University, 1994, U.C. San Diego, 1994, University of Toronto, 1994, Brown University, 1994, MIT, 1994.

Probability Seminars:

U.C. Berkeley, 2025, U.C. Davis, 2025. U.Penn, 2024, Oxford University, 2020 (remote), Duke University, 2015, MIT, 2013, Stanford University, 2012, York University, 1995.

Combinatorics Seminars:

U.C. Davis, 2002, University of Pennsylvania, 1995, MIT, 1995, DIMACS / Rutgers, 1995.

Mathematical Physics Seminars:

Georgia Tech, 2025.

C. Special Activities

Keynote talk at the “Math Prize for Girls” annual competition, 2020.

Panelist, Joint Committee on Women in the Mathematical Sciences, on “Effective self-promotion to advance your career in mathematics,” Joint Mathematics Meetings, San Antonio, 2015.

Participant in the Computing Community Consortium (CCC) Leadership in Science Policy

Institute (LiSPI) November, 2011.

Panelist for OurCS Opportunities for Undergraduate Research in Computer Science, CMU, Pittsburgh, PA, 2007.

Plenary Talk at Yellow Pigs Math Days: celebrating 34 years of Hampshire College Summer Studies in Mathematics, Amherst, MA, July 2006.

Computer science representative at an interdisciplinary science roundtable for the W. M. Keck Foundation, New York, NY, May 2006.

National Academy of Sciences *Annual Japanese-American Frontiers of Science Symposium*, Invited participant, Irvine, CA, 2004; Planning Committee, Shonan Villiage, Japan, 2005; Co-chair of the Planning Committee, Irvine, CA, 2006.

Invited lectures on Markov Chains, Mathematics REU Program for undergraduates, Clemson University, June 2005.

National Academy of Sciences *Annual Frontiers of Science Symposium*, Invited participant, Irvine, CA, 1997.

Invited colloquium at the *Summer Institute for the Mathematical Sciences* (SIMS program for undergraduate women), May 1996.

DIMACS Young Scholars Program in Discrete Mathematics, March 1995.