

Michael Hinczewski

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Born: 3/8/1979 in Łódź, Poland  
Citizenship: U.S.A.

**Education:**

8/05: Ph.D. in Physics, Massachusetts Institute of Technology  
9/99 – 8/05: Massachusetts Institute of Technology, Physics Ph.D. studies  
in Condensed Matter Theory, with Prof. A. Nihat Berker  
5/99: Bachelor of Science (summa cum laude) in Physics, Yale University  
9/97 – 5/99: Undergraduate studies at Yale University  
9/95 – 5/97: Undergraduate studies at Simon's Rock College of Bard

**Positions:**

8/09 – present: Postdoctoral Researcher, University of Maryland  
9/08 – 7/09: Postdoctoral Researcher, Technical University of Munich  
9/05 – 8/08: Postdoctoral Researcher, TÜBITAK - Bosphorus University Feza Gürsey  
Institute  
9/99 – 8/05: Research / Teaching Assistant, Massachusetts Institute of Technology

**Awards:**

5/05: Goodwin Medal, Massachusetts Institute of Technology, presented to a  
"conspicuously effective young teacher who is also a graduate  
student"  
9/00: Buechner Teaching Prize, MIT Physics Department  
5/99: DeForest Pioneers Prize, Yale Physics Department, for research leading to  
senior thesis: "*A Numerical Model for Seismic Anisotropy in the Inner  
Core of the Earth*", under Prof. Neil Ribe of the Yale Geology and  
Geophysics Department  
1997: Barry M. Goldwater Scholarship for Math and Science  
1995: Simon's Rock College, Acceleration to Excellence Program

**Visiting Positions:**

**5/14 - 6/11/07:** Deutscher Akademischer Austausch Dienst (DAAD) Scholarship:  
"Research Stays for University Academics and Scientists"  
Bio Soft-Matter Theory group, Technical University of Munich  
collaboration with: Prof. Roland Netz

**10/2 - 10/29/07:** Tokyo Institute of Technology, Nishimori Statistical Physics Group  
collaboration with: Prof. Hidetoshi Nishimori

**Teaching Activities:**

**July 2008:** Recitation instructor, Phase Transitions and Renormalization-Group Theory,  
Feza Gürsey Institute

**July 2008:** Course lecturer, Statistical Field Theory of Biopolymers, International Advanced  
Research School, Institute of Theoretical and Applied Physics,  
Turunç, Turkey

**July 2007:** Invited lecturer and recitation instructor, Phase Transitions and  
Renormalization-Group Theory, Feza Gürsey Institute

**Fall 2006:** Course lecturer, Renormalization-Group Methods in Statistical Field  
Theory, Feza Gürsey Institute

**January 2005:** Recitation instructor, MIT course 8.334: Statistical Mechanics II

**Fall 2004:** Recitation instructor, MIT course 8.321: Quantum Theory I

**Summer 2004:** Head Physics Instructor, MIT Project Interphase

**Spring 2004:** Recitation instructor, MIT course 8.323: Quantum Field Theory I  
Writing tutor, MIT course 8.06: Quantum Mechanics III

**Fall 2003:** Lecturer, Istanbul Technical University: Modern Physics

**Spring 2003:** Lecturer, Istanbul Technical University: Modern Physics

**Fall 2002:** Recitation instructor, MIT course 8.022: Physics II

**Spring 2002:** Lecturer, Istanbul Technical University: Modern Physics

**Fall 2001:** Recitation instructor, MIT course 8.05: Quantum Mechanics II

**Summer 2001:** Recitation instructor, Phase Transitions and Renormalization-Group Theory,  
Feza Gürsey Institute

**Spring 2001:** Writing tutor, MIT course 8.059: Quantum Mechanics III

**Fall 2000:** Recitation instructor, MIT course 8.05: Quantum Mechanics II

**Spring 2000:** Recitation instructor, MIT course 8.02: Physics II

**Fall 1999:** Recitation instructor, MIT course 8.01: Physics I

**Articles:**

*In press and preprints:*

24. "How the diffusivity profile reduces the arbitrariness of protein folding free energies"  
M. Hinczewski, Y. von Hansen, J. Dzubiella, and R.R. Netz, J. Chem. Phys. in press, (2010).

23. "Dynamics of DNA: Experimental controversies and theoretical insights"  
M. Hinczewski and R.R. Netz, Physica A in press, Proceedings of the Nihat Berker 60th Birthday Symposium (2010).

22. "The tensor renormalization group for pure and disordered two-dimensional lattice systems"  
C. Güven and M. Hinczewski, Physica A in press, Proceedings of the Nihat Berker 60th Birthday Symposium (2010).

21. "Anisotropic Mean-Field Theory for Semiflexible Polymer Dynamics under Tension"  
M. Hinczewski and R.R. Netz, preprint, arXiv:0908.0376 (2009).

*Published:*

20. "DNA-protein binding rates: Bending fluctuation and hydrodynamic coupling effects"  
Y. von Hansen, R.R. Netz, and M. Hinczewski, J. Chem. Phys. 132, 135103 (2010).

19. "Global cross-over dynamics of single semiflexible polymers"  
M. Hinczewski and R.R. Netz, EPL 88, 18001, 1-6 (2009).

18. "Critical percolation phase and thermal Berezinskii-Kosterlitz-Thouless transition in a scale-free network with short-range and long-range random bonds"  
A.N. Berker, M. Hinczewski, and R.R. Netz, Phys. Rev. B 80, 041118, 1-4 (2009).

17. "Infinitely Robust Order and Local Order-Parameter Tulips in Apollonian Networks with Quenched Disorder"  
C. Nadir Kaplan, M. Hinczewski and A.N. Berker, Phys. Rev. E 79, 061120, 1-5 (2009).

16. "End-Monomer Dynamics in Semiflexible Polymers"  
M. Hinczewski, X. Schlagberger, M. Rubinstein, O. Krichevsky, and R.R. Netz, Macromolecules 42, 860-875 (2009).

15. "Frustrated further-neighbor antiferromagnetic and electron-hopping interactions in the  $d=3$   $t$ - $J$  model: Finite-temperature global phase diagrams from renormalization group theory"  
C. Nadir Kaplan, A.N. Berker, and M. Hinczewski, Phys. Rev. B 80, 214529, 1-11 (2009).

14. "Finite-temperature phase diagram of nonmagnetic impurities in high-temperature superconductors using a  $d=3$   $t$ - $J$  model with quenched disorder"  
M. Hinczewski and A.N. Berker, Phys. Rev. B 78, 064507, 1-5 (2008).

13. "Reentrant and Forward Phase Diagrams of the Anisotropic Three-Dimensional Ising Spin Glass"  
C. Güven, A.N. Berker, M. Hinczewski, and H. Nishimori, *Phys. Rev. E* **77**, 061110, 1-6 (2008).
12. "Excitation Spectrum Gap and Spin-Wave Velocity of XXZ Heisenberg Chains: Global Renormalization-Group Calculation"  
O.S. Sariyer, A.N. Berker, and M. Hinczewski, *Phys. Rev. B* **77**, 134413, 1-10 (2008).
11. "Modeling the Optical Properties of  $\text{WO}_3$  and  $\text{WO}_3$ - $\text{SiO}_2$  Thin Films"  
D. Saygin-Hinczewski, M. Hinczewski, I. Sorar, F.Z. Tepehan, and G.G. Tepehan, *Solar Energy Mater. Solar Cells* **92**, 821-829 (2008).
10. "High-Precision Thermodynamic and Critical Properties from Tensor Renormalization-Group Flows"  
M. Hinczewski and A.N. Berker, *Phys. Rev. E* **77**, 011104, 1-6 (2008).
9. "Griffiths Singularities and Algebraic Order in the Exact Solution of an Ising Model on a Fractal Modular Network"  
M. Hinczewski, *Phys. Rev. E* **75**, 061104, 1-6 (2007).
8. "Optical and Structural Properties of  $\text{Ta}_2\text{O}_5$ - $\text{CeO}_2$  Thin Films"  
D. Saygin-Hinczewski, K. Koc, I. Sorar, M. Hinczewski, F.Z. Tepehan, and G.G. Tepehan, *Solar Energy Mater. Solar Cells* **91**, 1726-1732 (2007).
7. "d=3 Anisotropic and d=2 tJ Models: Phase Diagrams, Thermodynamic Properties, and Chemical Potential Shift"  
M. Hinczewski and A.N. Berker, *Eur. Phys. J. B* **51**, 461-472 (2006).
6. "Inverted Berezinskii-Kosterlitz-Thouless Singularity and High-Temperature Algebraic Order in an Ising Model on a Scale-Free Hierarchical-Lattice Small-World Network"  
M. Hinczewski and A.N. Berker, *Phys. Rev. E* **73**, 066126, 1-22 (2006).
5. "Two Superconducting Phases in the d=3 Hubbard Model: Phase Diagram and Specific Heat from Renormalization-Group Calculations"  
M. Hinczewski and A.N. Berker, *Eur. Phys. J. B* **48**, 1-17 (2005).
4. "Multicritical Point Relations in Three Dual Pairs of Hierarchical-Lattice Ising Spin-Glasses"  
M. Hinczewski and A.N. Berker, *Phys. Rev. B* **72**, 144402, 1-6 (2005).
3. "Optical Filters from  $\text{SiO}_2$  and  $\text{TiO}_2$  Multilayers Using Sol-Gel Spin Coating Method"  
D. Saygin Hinczewski, M. Hinczewski, F.Z. Tepehan, and G.G. Tepehan, *Solar Energy Mater. Solar Cells* **87**, 181-196 (2005).
2. "Elastic and Attenuation Anisotropy in Directionally Solidified (hcp) Zinc, and the Seismic Anisotropy in the Earth's Inner Core"  
M.I. Bergman, L. Giersch, M. Hinczewski, and V. Izzo, *Phys. Earth Planet. Int.* **117**, 139-151 (2000).

1. "The Response of a Damped Pendulum to a Large Driving Force"  
M. Hinczewski and J.C.W. Rogers, Eur. J. Appl. Math. **9**, 105-127 (1998).

**Talks:**

*Invited University Seminars:*

"Dynamics of DNA: experimental controversies and theoretical insights"  
Forschungszentrum Jülich (19 May 2009)

"Hydrodynamic effects on the kinetics of DNA: experimental controversies and theoretical insights"  
Johannes Gutenberg-Universität Mainz (12 May 2009)

"Unusual Phase Transitions in Complex Networks: Algebraic Order and Griffiths Singularities in Small-world, Fractal Hierarchical Lattices"  
Tokyo Institute of Technology (4 October 2007)

"Unusual Phase Transitions in Complex Networks: Algebraic Order and Griffiths Singularities in Small-world, Fractal Hierarchical Lattices"  
Technische Universität München (5 June 2007)

"Unusual Phase Transitions in Complex Networks: Berezinskii-Kosterlitz-Thouless Singularities in Scale-Free, Small-World and Modular Hierarchical Lattices"  
University of Michigan (12 December 2006)

"Statistical Mechanics on Complex Networks: Unusual Magnetic Orderings on a Scale-Free, Small-World Hierarchical Lattice"  
Koç University (5 October 2006)

"Inverted Berezinskii-Kosterlitz-Thouless Singularity and High-Temperature Algebraic Order in an Ising Model on a Scale-Free Hierarchical-Lattice Small-World Network"  
Service de Physique Theorique de Saclay (22 May 2006)

"New Phases, Superfluid Weights, and Free Carrier Densities: Renormalization-Group Theory of Electronic Models"  
Rutgers University (23 March 2006)

"New Phases, Superfluid Weights, and Free Carrier Densities: Renormalization-Group Theory of Electronic Models"  
ETH Zürich (8 December 2005)

"The Ising Model on a Scale-Free, Small-World Hierarchical Lattice Network"  
Technische Universität München (7 December 2005)

“The Ising Model on a Scale-Free, Small-World Hierarchical Lattice Network”

Ludwig-Maximilians-Universität München (6 December 2005)

“Phase Diagrams of Electronic Systems in 3D: Effects of Spatial Anisotropy and Quenched Impurities”

Feza Gürsey Institute (1 December 2005)

*Invited Conference Talks:*

“Connection between Geometry and Thermal Correlations: Small-World and Community Effects in Scale-Free Hierarchical Networks”

3<sup>rd</sup> Bilateral Workshop on Novel Materials, Koç University (20 May 2008)

“Renormalization-Group Theory of Electronic Models: Finite-Temperature Phase Diagrams and the Effects of Spatial Anisotropy and Quenched Disorder”

6<sup>th</sup> International Conference of the Balkan Physical Union, Istanbul University (25 August 2006)

“Finite-Temperature Phase Diagram of the Hubbard Model in  $d=3$  from Renormalization-Group Theory”

10<sup>th</sup> International Statistical Physics Days, Istanbul Technical University (3 July 2003)

*Contributed Conference Talks:*

“DNA as dynamic force transducer for protein folding studies ”

M. Hinczewski and R.R. Netz, Physics of DNA Assembly and Applications, École de Physique Les Houches (4-8 May 2009)

“End-Monomer Dynamics in Semiflexible Polymers”

M. Hinczewski, X. Schlaberger, M. Rubinstein, O. Krichevsky, and R.R. Netz, Deutsche Physikalische Gesellschaft Spring Meeting, Dresden (23-27 March 2009)

“End-Monomer Dynamics in Semiflexible Polymers”

M. Hinczewski, X. Schlaberger, M. Rubinstein, O. Krichevsky, and R.R. Netz, March Meeting of the American Physical Society, Pittsburgh (16-20 March 2009)

“End-Monomer Dynamics in Semiflexible Polymers”

M. Hinczewski, X. Schlaberger, M. Rubinstein, O. Krichevsky, and R.R. Netz, 100th Statistical Mechanics Conference, Rutgers University (13-18 December 2008)

“High-Precision Thermodynamic and Critical Properties from Tensor Renormalization-Group Flows”

March Meeting of the American Physical Society, New Orleans (10-14 March 2008)

“High-Precision Thermodynamic and Critical Properties from Tensor Renormalization-Group Flows”

M. Hinczewski and A.N. Berker, 98th Statistical Mechanics Conference, Rutgers University (16-18 December 2007)

“Unusual Phase Transitions in Scale-Free Networks: Algebraic Order and Griffiths Singularities in Small-world and Fractal Hierarchical Lattices”

23rd IUPAP International Conference on Statistical Physics, Genova (9-13 July 2007)

“Griffiths singularities and algebraic order in the exact solution of an Ising model on a modular network”

March Meeting of the American Physical Society, Denver (5-9 March 2007)

“Inverted Berezinskii-Kosterlitz-Thouless Singularity and High-Temperature Algebraic Order in an Ising Model on a Scale-Free Hierarchical-Lattice Small-World Network”

M. Hinczewski and A.N. Berker, 96th Statistical Mechanics Conference, Rutgers University (17-19 December 2006)

“Inverted Berezinskii-Kosterlitz-Thouless Behavior on a Scale-Free Hierarchical-Lattice Small-World Network”

M. Hinczewski and A.N. Berker, March Meeting of the American Physical Society, Baltimore (13-17 March 2006)

“New Phases, Superfluid Weights, Free Carrier Densities: RG Theory of Hubbard, tJ Models”

A.N. Berker and M. Hinczewski, March Meeting of the American Physical Society, Baltimore (13-17 March 2006)

“The Ising Model on a Scale-Free, Small-World Hierarchical Lattice Network”

M. Hinczewski and A.N. Berker, Journées de Physique Statistique 2006, Ecole Supérieure de Physique et Chimie de Paris (26 January 2006)

“Phase Diagrams of Electronic Systems in 3d: Effects of Spatial Anisotropy and Quenched Impurities”

M. Hinczewski and A.N. Berker, 94th Statistical Mechanics Conference, Rutgers University (19 December 2005)