CURRICULUM VITAE
JAN TOBOCHNIK

Dow Distinguished Professor in the Natural Sciences

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Professional Employment

2000 –	Professor of Physics and Computer Science, Kalamazoo College
2001 – 2011	Editor, *American Journal of Physics*
2007 – 2008	Interim Provost (on leave as Editor of AJP)
1996 – 2007	Chair, Department of Physics, Kalamazoo College
1991 – 2000	Associate Professor of Physics and Computer Science, Kalamazoo College
1991 – 1992	Visiting Professor, Department of Physics, McGill University
1985 – 1991	Assistant Professor of Physics and Computer Science, Kalamazoo College
Fall 1988, 1989	Visiting Scholar, Center for Fundamental Materials Research, Michigan State University
1985 – 1986	Visiting Scholar, Polymer Center, Boston University
Spring 1985	Visiting Assistant Professor, Clark University
1982 – 1983	Assistant Professor, Worcester Polytechnic Institute
Summer 1981	Visiting Scientist, IBM, Yorktown Heights, NY
1980 – 1982	Research Associate, Rutgers University

Education

Ph.D., Physics, Cornell University, June 1980.
B. A. Summa Cum Laude, Physics, Amherst College, Amherst, MA, June 1975.

Honors and Professional Activities

- Editor of *American Journal of Physics*, 2001– 2011 Ex officio member of the Executive Committee of the American Association of Physics Teachers (AAPT). Member of Publications Committee of AAPT.
- Divisional Associate Editor, *Physical Review Letters*, 2001-2006.
- Member of the Committee on Publishing Policy of the American Institute of Physics, 2006–2012.
- Fellow of the American Physical Society, elected 1999.
- Named as one of the inaugural group of 534 Outstanding Referees by the American Physical Society, 2008.
- Computer Simulations Department co-editor for the journals *Computers in Physics* 1989–1998 and *Computing in Science and Engineering* 1999–2001.

- Elected member of the executive committee of the Division of Computational Physics of the American Physical Society, term of office 1997–99.
- Awarded Lucasse Fellowship for excellence in scholarship at Kalamazoo College, 1995–96.
- Co-Chair of the Gordon Research Conference on Physics Research and Education: Thermal and Statistical Physics, June 2000. Co-founder of the series on Physics Research and Education.
- Guest co-editor of the first ever theme issue of the *American Journal of Physics* on Statistical and Thermal Physics, December 1999.
- Member of American Physical Society, American Association of Physics Teachers and its Michigan branch, American Association of University Professors (President of Kalamazoo College chapter 1996-1998, Treasurer 2003–), and Phi Beta Kappa (President of Kalamazoo College chapter 1997–98, President of the Southwest Michigan Association 2005–2010).

Research

Theoretical condensed matter physics with a focus on computer simulations in statistical physics. Work has included studies of networks, structural glass transitions, granular matter, phospholipid phase transitions, quenching of binary alloys, transport through random media, quantum Monte Carlo, percolation, Monte Carlo Renormalization Group methods, and two dimensional phase transitions. Currently working on models of social networks in particular friendship networks and patent citation networks.

Teaching

Physics: Introductory Mechanics, Electricity and Magnetism, Modern Physics, Atomic and Nuclear Physics, Computer Programming and Simulation, Thermal Physics, Electrodynamics, Quantum Mechanics, Classical Mechanics, Medical Physics, Chaos.

Computer Science: Introductory Computer Science, Computer Science for non-science majors, Models and Simulation, Digital Electronics, Programming Languages.

Publications: Books

- *Statistical and Thermal Physics With Computer Applications*, Harvey Gould and Jan Tobochnik, Princeton University Press, Princeton (2010).
- *Solutions Manual to Statistical and Thermal Physics With Computer Applications*, Jan Tobochnik and Harvey Gould, Princeton University Press, Princeton (2010).

- *An Introduction to Computer Simulation Methods: Applications to Physical Systems*, third edition, Harvey Gould, Jan Tobochnik and Wolfgang Christian, Addison-Wesley, Reading MA (2007).

- *An Introduction to Computer Simulation Methods: Applications to Physical Systems*, second edition, H. Gould and J. Tobochnik, Addison-Wesley, Reading MA (1996). Translated into Japanese.

- *Thermal and Statistical Physics: Consortium for Upper-level Physics Software*, H. Gould, L. Spornick, and J. Tobochnik, John Wiley and Sons, New York (1995). Translated into Japanese.

- *An Introduction to Computer Simulation Methods: Applications to Physical Systems, Parts 1 and 2*, H. Gould and J. Tobochnik, Addison-Wesley, Reading MA (1988). Translated into Russian.

Publications: Refereed Articles

- "Patent Citation Networks Revisited: Signs of a Twenty-First Century Change?" Katherine J. Strandburg, Gábor Csárdi, Jan Tobochnik, Péter Érdi and László Zalányi, North Carolina Law Review **87**(5), 1657–1698 (2009).

- "Teaching statistical physics by thinking about models and algorithms," Jan Tobochnik and Harvey Gould, Am. J. Phys. **76**, 353–359 (2008); physics/0712.3488.

- "Modeling innovation by a kinetic description of the patent citation system," Gábor Csárdi, Katherine J. Strandburg, László Zalányi, Jan Tobochnik, and Péter Érdi, Physica A **374**(2), 783–793 (2007); physics/0508132.

- "Network Science and Law: A Sales Pitch and a Sample," Katherine J. Strandburg, Gábor Csárdi, Péter Érdi, László Zalányi, and Jan Tobochnik, Berkeley Technology Law Journal **21**(4), 1293–1362 (2006).

- "Understanding the temperature and the chemical potential through computer simulations," Jan Tobochnik, Harvey Gould and Jonathan Machta, Am. J. Phys. **73**(8), 708–716 (2005), physics/0411161.

- "Properties of a random attachment growing network," László Zalányi, Gábor Csárdi, Tamás Kiss, Máté Lengyel, Rebecca Warner, Jan Tobochnik and Péter Érdi, Phys. Rev. E. **68**, 066104 (2003), cond-mat/0305299.

- "Teaching Computational Physics to Undergraduates," J. Tobochnik and H. Gould, in *Annual Reviews of Computational Physics IX*, D. Stauffer, ed. World, Scientific, Singapore (2001).

- "Resource Letter CPPPT-1: Critical point phenomena and phase transitions," Jan Tobochnik, Am. J. Phys. **69**, 255 (2001);

- "Clusters and Fluctuations at Mean-Field Critical Points and Spinodals," W. Klein, Harvey Gould, J. Tobochnik, F. J. Alexander, M. Anghel, and Gregory Johnson, Phys. Rev. Lett. **85**, 1270 (2000), cond-mat/0001230.

- "Granular collapse as a percolation transition," J. Tobochnik, Phys. Rev. E **60**, 7137 (1999), cond-mat/9905254.

- "Simulation of hydrogen bonding and hydration in pure lipid bilayers," J. Tobochnik, M. J. Zuckermann, and Z. Zhang, Phys. Rev. E **51**, 6204 (1995).

- "Universal conductivity in the two-dimensional boson Hubbard model," G. G. Batrouni, B. Larson, R. T. Scalettar, J. Tobochnik, and J. Wang, Phys. Rev. B **48**, 9628 (1993), cond-mat/9302037.

- "Lattice model for hydrogen bonding and hydration in pure lipid bilayers," Z. Zhang, J. Tobochnik, M. J. Zuckermann, and J. Silvius, Phys. Rev. E **47**, 3721 (1993).

- "Random-walk Simulation of the Dielectric Constant of a Composite Material," R. I. Cukier, S.Y. Sheu, and J. Tobochnik, Phys. Rev. B **42**, 5342 (1990).

- "Random Walk Calculation of Conductivity in Continuum Percolation," J. Tobochnik, D. Laing, and G. Wilson, Phys. Rev. A **41**, 3052 (1990).

- "Efficient random walk algorithm for computing conductivity in continuum percolation systems," *Comput. Phys.*, J. Tobochnik **4**(2), 181 (1990).

- "The Conductance of a Plane Containing Random Cuts," J. Tobochnik, M. A. Dubson, M. L. Wilson, and M. F. Thorpe, Phys. Rev. A **40**, 5377 (1989).

- "Monte Carlo Simulation of Hard Spheres Near Random Closest Packing using Spherical Boundary Conditions," J. Tobochnik and P. M. Chapin, J. Chem. Phys. **88**, 5824 (1988).

- "Early Time Instabilities in a Dynamic Percolation Model" J. Tobochnik, H. Gould and W. Klein, Phys. Rev. B **33**, 377 (1986).

- "Some Developments in the Theory of Modulated Order: II. Deformable Lattice Models and the ANNNI Model as a Random Magnet," T. DeSimone, R. M. Stratt, and J. Tobochnik, Phys. Rev. B **32**, 1549 (1985).

- "Kinetics of a First Order Phase Transition: Computer Simulations and Theory," O. Penrose, J. Lebowitz, J. Marro, M. Kalos, J. Tobochnik, J. Stat. Phys. **34**, 399 (1984).

- "Long-Range Orientational Order in Two Dimensional Liquid Crystals," J. Tobochnik and G. V. Chester, Phys. Rev. A **27**, 1221 (1983).

- "Properties of the q-State Clock Model for $q = 4$, 5, and 6," J. Tobochnik, Phys. Rev. B **26**, 6201 (1982).
- "Properties of Two Dimensional Polymers," J. Tobochnik, I. Webman, J. L. Lebowitz, and M. H. Kalos, Macromolecules **15**, 549 (1982).
- "Calculation of the Dynamical Exponent z for the Three-State Potts Model," J. Tobochnik and C. Jayaprakash, Phys. Rev. B **25**, 4893 (1982).
- "Monte Carlo Renormalization Group Analysis of the Antiferromagnetic Three-State Potts Model on a Square Lattice," J. Tobochnik and C. Jayaprakash, Phys. Rev. B **25**, 4890 (1982).
- "Monte Carlo Study of Melting in Two Dimensions," J. Tobochnik and G. V. Chester, Phys. Rev. B **26**, 6778 (1982).
- "Physics of the Dynamical Critical Exponent in One Dimension," R. Cordery, S. Sarker, and J. Tobochnik, Phys. Rev. B **24**, 5402 (1981).
- "Dynamic Monte Carlo Renormalization Group," J. Tobochnik, S. Sarker and R. Cordery, Phys. Rev. Lett. **46**, 1417 (1981).
- "Monte Carlo Renormalization Group Analysis of the Classical Heisenberg Model in Two Dimensions," S. H. Shenker and J. Tobochnik, Phys. Rev. B **22**, 4462 (1980).
- "Monte Carlo Study of the Planar Spin Model," J. Tobochnik and G. V. Chester, Phys. Rev. B **20**, 3761 (1979).

Publications: Columns in *Computers in Physics*

- "Entropy Driven Phase Transitions," Harvey Gould, Jan Tobochnik, and Louis Colonna-Romano, **11**(2), 157 (1997).
- "Lattice Simulations of Biological Membranes," Jan Tobochnik and Harvey Gould, **10**(6), 542 (1996).
- "Fortran Compilers for Personal Computers," Neal Tobochnik and Jan Tobochnik, **7**(6), 672 (1993).
- "Quantum Monte Carlo on a Lattice," George Batrouni, J. Tobochnik, and H. Gould, **6**(6), 673 (1992).
- "Dynamics of the Classical Heisenberg Chain," Zoran Slanic, H. Gould, and J. Tobochnik, **5**(6), 630 (1991).
- "Diffusion Quantum Monte Carlo," P. J. Reynolds, J. Tobochnik and H. Gould, **4**(6), 662 (1990).
- "An Introduction to Quantum Monte Carlo," J. Tobochnik, H. Gould and K. Mulder, **4**(4), 431 (1990).

- "More on Fractals and Chaos: Multifractals," H. Gould and J. Tobochnik, **4**(2), 202 (1990).
- "Quantifying Chaos," J. Tobochnik and H. Gould, **3**(6), 86 (1989).
- "Overcoming Critical Slowing Down," H. Gould and J. Tobochnik, bf 3(4), 82 (1989).

Publications: Articles in Conference Proceedings

- "The Inverse Problem of Evolving Networks with Application to Social Nets," Gábor Csárdi, Katherine J. Strandburg, Jan Tobochnik, and Péter Érdi in *Handbook of Large-Scale Random Networks Series: Bolyai Society Mathematical Studies*, Vol. **18**, Béla Bollobás, Robert Kozma and Dezsö Miklós, Eds. (2009).
- "Teaching students to write computer simulations in Java," J. Tobochnik, Comp. Phys. Comm. **121-122**, 562 (1999).
- "Big and Little Uses of the Computer in a Statistical Mechanics Course," J. Tobochnik, *Computing in Advanced Undergraduate Physics*, edited by David M. Cook, Lawrence University, 59 (1990)
- "The Melting of Two Dimensional Solids," J. Tobochnik and G.V. Chester, *Ordering in Two Dimensions*, Amsterdam, Netherlands, North Holland, 339 (1981).

Book Reviews

- *A First Course in Computational Physics and Object-Oriented programming with C++*, David Yevick, Cambridge U. Press (2005) reviewed by J. Tobochnik, *Physics Today* **59**(3), 63–64 (2006).
- *Computational Physics*, Rubin H. Landau and Manuel Páez, Wiley (1997); *An Introduction to Computational Physics*, Tao Pang, Cambridge U.P. (1997); *Stochastic Simulation in Physics*, P. Kevin MacKeown, Springer (1998); reviewed by H. Gould and J. Tobochnik, *Am. J. Phys.*,**67**(1), 94 (1999).
- *Understanding Molecular Simulation*, Daan Frenkel and Berend Smit, Academic Press (1996) reviewed by J. Tobochnik, *Comput. Phys.* **11**(4), 351 (1997).

External Funding

- "OPTIC: Open Physics Technology for Interactive Curricula," with Wolfgang Christian, Anne J. Cox, Harvey A. Gould, and Mario J. Belloni, National Science Foundation, $450,000, 2005–2010.
- "U.S.- Hungary Research on Social Networks as Evolving Complex Networks," with Péter Érdi, National Science Foundation, $16,050, 2004–2005.
- "Model Studies of the Glass Transition," Petroleum Research Fund, $30,000, 1999–2001.
- "New Curricular Materials for Upper Level Undergraduate Courses on Thermal and Statistical Physics," National Science Foundation $293,885, 1998–2003, with Clark University.
- "Dynamics of Hydrogen Bond Networks," Petroleum Research Fund, $25,000, 1996–99.
- "Development of Curricular Materials for an Introductory Level Computer Simulation Laboratory in Physics," National Science Foundation ILI, $99,960, 1993–95, with Clark University.
- "Development of Curricular Materials and Software for the Incorporation of Computational Physics into Upper Level Undergraduate Physics Courses," National Science Foundation $182,936, 1993–97, with Clark University.
- "Lattice Models for Hydrogen Bonding in Lipid Bilayers," Petroleum Research Fund, $25,000, 1993–96.
- "Diffusion in Porous Media," Petroleum Research Fund, $20,000, 1990–93.
- "Computer Simulation Laboratory for Undergraduate Thermal Physics and Introductory Physics," National Science Foundation ILI, $13,750 1988–90.
- "A Community Science and Mathematics Educational Software Resource and Development Center," Kalamazoo Foundation, with David Winch, $30,000, 1988–91.
- Grant of computer equipment from Apple Computer, $19,116, 1988.
- "Cooperative Science Educational Software Development Center," Kalamazoo Consortium for Higher Education, with David Winch, $13,400, 1987–89.
- "Computer Simulation and Theoretical Studies of Transport in Inhomogenous Media," Petroleum Research Fund, $19,200, 1986–89.

- "Computer Simulation of Quenched Binary Fluids," Research Corporation, $9,400, 1986–88.
- "Transport in Inhomogeneous Media," Cornell Supercomputer Center, $20,000 of computer time, 1986.