

## Bibliography

- [1] A. L. Lehninger, D. L. Nelson, and M. M. Cox, editors. *Principles of Biochemistry*. Worth Publishers, 3rd edition, 2000
  
- [2] Harvey Lodish, Arnold Berk, Paul Matsudaira, *Molecular Cell Biology*, W.H. Freeman and Co, ISBN: 071676152, 5th Edition 2004
  
- [3] Philip Nelson, *Biological Physics: Energy, Information, Life*, Publisher: W H Freeman and Co, 2003
  
- [4] P. Nelson, *Biological physics*, W.H.Freeman, 2004
  
- [5] David Boal, *Mechanics of the Cell*, Cambridge University Press, 2002.
  
- [6] Roland Glaser, *Biophysics*, New York : Springer, 2001.

- 
- [7] Rodney Cotterill, *Biophysics : An introduction*, Chichester ; New York : Wiley, 2002
- [8] *Biology at the single molecule level*, edited by S.H. Leuba, and J. Zlatanova Publisher Amsterdam ; New York : Pergamon, 2001.
- [9] Michel Daune *Molecular biophysics : structures in motion*, Oxford ; New York : Oxford University Press, 1999
- [10] Howard Berg *Random Walks in Biology*, Princeton University Press, 1993.
- [11] Richard A.L. Jones, “Soft Condensed Matter”, Oxford University Press (2002).
- [12] Thomas A. Witten, “Structured Fluids: Polymers, Colloids, Surfactants”, OUP (2004).
- [13] Michael Rubinstein and Ralph H. Colby, “Polymer Physics”, OUP (2003).
- [14] Alexander Y. Grosberg, Alexei R. Khokhlov, “Statistical Physics of Macromolecules”, AIP Press (2002).

- 
- [15] Sam A. Safran, “Statistical Thermodynamics of Surfaces, Interfaces, and Membranes”, Perseus Books (2003).
- [16] Philip Nelson, Biological Physics”, W.H. Freeman and Company (2003).
- [17] Samuel A. Safran *Statistical Thermodynamics of Surfaces, Interfaces and Membranes*, Addison-Wesley, Reading, MA, 1994.
- [18] Malcolm N. Jones, Dennis Chapman *Micelles, monolayers, and biomembranes*, New York : Wiley-Liss, 1995.
- [19] D.Boal, *Mechanics of the Cell*, Cambridge University Press, 2002
- [20] P.J. Flory, *Statistical Mechanics of Chain Molecules*, Interscience, New York, 1969
- [21] Warner (1972)
- [22] G. Grest and K.Kremer (1986)
- [23] H. Yamakawa, *Modern Theory of Polymer Solutions* Harper and Row, New York, 1971

- [24] B. Derrida, (1981). Random-energy model: An exactly solvable model of disordered systems. *Phys. Rev. B* **24**, 2613-2626
- [25] J. Bryngelson and P. Wolynes (1987). Spin glasses and the statistical mechanics of protein folding. *Proc. Natl. Acad. Sci. USA* **84**, 7524-7528.
- [26] E. Shakhnovich and A. Gutin, (1989). Formation of unique structure in polypeptide chain. Theoretical investigation with the aid of a replica approach. *Biophys. Chem.* **34**, 187-199.
- [27] K. Binder, *Monte Carlo and Molecular Dynamics Simulations in Polymer Science* (Oxford University Press, Oxford, 1995).
- [28] J. Baschnagel, K. . Binger, and W. P. et al., *J. Chem. Phys.* **95**, 6014 (1991).
- [29] M. Bishop, M. H. Kalos, , and H. L. Frisch, *J. Chem. Phys.* **70**, 1299 (1979).
- [30] J. P. Ryckaert and A. Bellemans, *Chem. Phys. Lett.* **30**, 123 (1975).

- 
- [31] J. Kushnick and B. J. Berne, *J. Chem. Phys.* **64**, 1362 (1976).
- [32] J. G. Gay and B. J. Berne, *jchem* **74**, 3316 (1981).
- [33] K. M. Zimmer, A. Linke, and D. W. Heermann, *Macromol. Theory Simul.* **5**, 1065 (1996).
- [34] T. E. Creighton, *Proteins. Structure and Molecular Principles*, Freeman, New York 1984.
- [35] T. E. Creighton, Understanding protein folding pathways and mechanisms, in *Protein Folding*, L. M. Gierasch and J. King, eds., Amer. Ass. Adv. Sci., Washington 1990, pp. 157–170.
- [36] O. Kratky and G. Porod, *G. Recl. Trav. Chim.* **68**, 1106 (1949)
- [37] M. E. Fisher, *Am. J. Phys.* **32**, 342 (1964)
- [38] W. J. Orr, *Trans. Faraday Soc.* **43**, 12 (1947)
- [39] J. M. Hammersley and K. W. Morton, *J. Roy. Stat. Sot. B16*, 23 (1954)
- [40] P. G. de Gennes, *Scaling Concepts in Polymer Physics* (Cornell University Press Ithaca, New York, 1979).

- [41] D. S. McKenzie, *Phys. Rep.* C27, 35 (1976).
- [42] S. Safran, *Statistical Thermodynamics of Surfaces, Interfaces and Membranes*, Addison-Wesley, Reading, MA, 1994.
- [43] B. Alberts, D. Bray, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walter, *Molecular Biology of the Cell*, Garland Publishing, New York, 1998
- [44] H.E. Warriner, S.H.J. Idziak, N.L. Slack, P. Davidson, C.R. Safinya, *Science* **271**, 969 (1996).
- [45] Y. Yang, R. Prudhomme, K.M. McGrath, P. Richetti, C.M. Marques, *Phys. Rev. Lett.* **80**, 2729 (1998).
- [46] G. Bouglet, C. Ligoure, A.-M. Bellocq, E. Dufourc, G. Mosser, *Phys. Rev. E* **57**, 834 (1998).
- [47] R. Joannic, L. Auvray, D.D. Lasic, *Phys. Rev. Lett.* **78**, 3402 (1997).
- [48] E. Eisenriegler, *Polymers Near Surfaces*, World Scientific, Singapore, 1993).
- [49] P. G. de Gennes, *J. Phys. (France)* **1976**, 37, 1445.

- [50] P. G. de Gennes, *Macromolecules* **1980**, *13*, 1069.
- [51] S. Alexander, *J. Phys. (France)* **1977**, *38*, 983.
- [52] A. Halperin, M. Tirrell, and T. P. Lodge, *Adv. Polym. Sci.* **1991**, *100*, 31.
- [53] S. T. Milner, *Science* **1991**, *251*, 905.
- [54] T. Bickel, C. Marques, C. Jeppsen, *C. R. Acad. Sci. Paris, t. 1, Serie IV*, 661, (2000)
- [55] T. Bickel, C.M. Marques and C. Jeppesen *Euro. Phys. J. E* 2001
- [56] F. Bantignies, C. Grimaud, S. Lavrov, M. Gabut, G. Cavalli, *Inheritance of Polycomb-dependent chromosomal interactions in Drosophila*, *Genes Dev*, *17*, 2406-2420 (2003)
- [57] C. Rabl, *Morphologisches Jahrbuch* (ed. C. Gegenbauer), pp. 214-258 (1885).
- [58] J. Odenheimer, M. Brill and D.W. Heermann, *Forces by and on a Polymer Grafted to a Repulsive Wall*, *Int. J. Mod. Phys. C*, *16*, 10, 1577-1586 (2005)

- [59] D. Poland, H.A. Scheraga, Theory of Helix-Coil Transition in Biopolymers (Academic Press, New York, 1970)
- [60] C.R. Cantor, P.R. Schimmel, Biophysical Chemistry (Freeman, New York, 1980)
- [61] A.Y. Grosberg, A.R. Khokhlov, Statistical Physics of Macromolecules (AIP Press, New York 1994)
- [62] E. Ising, Z. Phys., 81, 253 (1923)
- [63] D. Poland, H.A. Scheraga, J. Chem. Phys. **45**, 1464 (1966)
- [64] Kittel
- [65] M. E. Fisher, J. Chem. Phys. **45**, 1469 (1966).
- [66] T. Bauxois, M. Peyrard and A.R. Bishop Phys. Rev E **47** 684 (1993)
- [67] P. Debye and E. Hückel, Z. Phys., 25, 185 (1923)
- [68] T. Odijk, J. Polym. Sci. Part B: Polym. Phys. **15**, 477 (1977)
- [69] J. Skolnick and M. Fixman, Macromolecules **10**, 944 1977



- [70] C. B. Anfinsen, E. Haber, and F. H. White. *The kinetics of the formation of native ribonuclease during oxidation of the reduced polypeptide domain*. Proceedings of the National Academy of Science, USA, 47:1309-1314 (1961)
- [71] Levinthal J. Chem. Phys. Vol. 65, pp. 44-55 (1968)
- [72] N. G. van Kampen, Stochastic Processes in Physics and Chemistry, North Holland, Amsterdam 1981.
- [73] C. W. Gardiner, Handbook of Stochastic Methods, Springer, Berlin 1985.
- [74] B. R. Brooks, R. E. Bruccoleri, B. D. Olafson, D. J. States, S. Swaminathan, and M. Karplus. CHARMM: A program for macromolecular energy minimization and dynamics calculations. J. Comp. Chem., 4:187–217, 1983.
- [75] A. D. MacKerell Jr., B. Brooks, C. L. Brooks III, L. Nilsson, B. Roux, Y. Won, and M. Karplus. CHARMM: The energy function and its parametrization with an overview of the program. In P. v. R. Schleyer, editor, The Encyclopedia of

- Computational Chemistry, volume 1, pages 271-277. John Wiley and Sons: Chichester, 1998.
- [76] B.J. Alder, T.E. Wainwright: *J. Chem. Phys.* **27**, 1208 (1957)
- [77] T.E. Wainwright, B.J. Alder. *Nuovo cimento* **9**, Suppl. Sec. 116 (1958)
- [78] B.J. Alder, T.E. Wainwright *J. Chem. Phys.* **31**, 456 (1959)
- [79] B.J. Alder, T.E. Wainwright *J. Chem. Phys.* **33**, 1439 (1960)
- [80] J.R. Beeler, Jr.: In *Physics of Many-Particle Systems*, ed. by C. Meeron (Gordon and Breach, New York 1964)
- [81] A. Rahman: *Phys. Rev.* **136**, A405 (1964)
- [82] L. Verlet: *Phys. Rev.* **159**, 98 (1967)
- [83] Y. B. Suris, *Comput. Math. Phys.*, **27**, pp. 149–156 (1987)
- [84] B. Gladman, M. Duncan, and J. Candy, Symplectic integrators for long-term integrations in celestial

- mechanics, *Celestial Mech. Dynam. Astronom.*, 52, pp. 221–240, (1991)
- [85] J. M. Sanz-Serna and M. P. Calvo, *Numerical Hamiltonian Problems*, Chapman and Hall, London, 1994
- [86] S. Duane, A. D. Kennedy, B. J. Pendleton and D. Roweth, *Phys. Lett. B* **195**, 216 (1987)
- [87] S. Duane, A.D. Kennedy, B.J. Pendelton, D. Roweth: *Phys. Rev. Lett.* 2, 195 (1987)
- [88] Mehlig, Heermann *Phys Rev B*
- [89] M. Creutz, *Phys. Rev. D* **38**, 1228 (1988)
- [90] A. D. Kennedy, *Nucl. Phys. (Proc. Suppl.)* **4**, 576 (1988)
- [91] A. D. Kennedy, *Nucl. Phys. (Proc. Suppl.)* **9**, 457 (1989)
- [92] S. Gupta, A. Irbäck, F. Karsch and B. Petersson, *Phys. Lett. B* **242**, 437 (1990)
- [93] R. Gupta, G. W. Kilcup and S. R. Sharpe, *Phys. Rev. D* **38**, 1278 (1988)

- 
- [94] A. D. Kennedy and B. J. Pendleton, Edinburgh preprint 90/498 (1990)
- [95] D.W. Heermann, P. Nielaba and M. Rovere, *Comput. Phys. Commun.* **60**, 311 (1990)
- [96] B. J. Pendleton (private communication)
- [97] D. W. Heermann, *Computer Simulation Methods in Theoretical Physics*, Springer-Verlag, Heidelberg 1990
- [98] K. Binder and D. W. Heermann, *Monte Carlo Simulation in Statistical Physics*, Springer-Verlag, Heidelberg 1988
- [99] K. Kremer, In: *Computersimulation in der Physik*, KFA Jülich, Jülich 1989
- [100] J. J. Nicolas, K. E. Gubbins, W. B. Streett and D. J. Tildesley, *Mol. Phys. A* **5**, (1978) 1429
- [101] M. Creutz and A. Goksch, *Phys. Rev. Lett.* **63**, 9 (1989)
- [102] M.P. Allen and D.J. Tildesley, *Computer Simulations of Liquids*, Clarendon Press, Oxford 1987

- [103] A. M. Ferrenberg and R. H. Swendsen, Phys. Rev. Lett. **61**, 2635 (1988)
- [104] A. M. Ferrenberg and R. H. Swendsen, Phys. Rev. Lett. **63**, 1195 (1989)
- [105] M. Falcioni, E. Marinari, M. L. Paciello, G. Parisi and B. Taglienti, Phys. Lett. B **108**, 331 (1982)
- [106] P. Peczak, A. M. Ferrenberg and D. P. Landau, University of Georgia preprint (1991)
- [107] E. Brézin, J. C. Le Guillou and J. Zinn-Justin, In: *Phase Transitions and Critical Phenomena* **6**, Academic Press, London 1976
- [108] K. A. Dill. *Theory for the folding and stability of globular proteins*. Biochemistry, 24:1501, (1985)
- [109] B. Berger and T. Leighton. *Protein folding in the hydrophobic-hydrophilic (HP) model is NP-complete*. Journal of Computational Biology, 5(1):27-40 (1998)
- [110] P. Crescenzi, D. Goldman, C. Papadimitriou, A. Piccolboni, and M. Yannakakis. *On the complexity*

- of protein folding*. Journal of Computational Biology, 5(3):423-465 (1998)
- [111] H. Li, R. Helling, C. Tang, and N. Wingreen, Science **273**, 666 (1996)
- [112] N. Madras and A.D Sokal, *The pivot algorithm: a highly efficient Monte Carlo method for the self-avoiding walk*, J. Stat. Phys. 50: 109-186, (1988)
- [113] Khrapunov, S. N., A.I. Dragan, A.V. Sivolob and A.M. Zagariya. 1997. Biochim. Biophys. Acta. 1351:213-222.
- [114] Luger et al. 1997. Nature. 389:251-260.
- [115] Bednar et al. 1998. Proc. Natl. Acad. Sci. USA. 95:14173-14178.
- [116] Dustin, I., P. Furrer, A. Stasiak, J. Dubochet, J. Langowski & E. Egelman. 1991. J. Struct. Biol. 107: 15-21
- [117] Stasiak, A., A. Adrian, J. Bednar, P. Furrer, B. ten Heggeler Bordier, W. Wahli & J. Dubochet. 1992. Basel, Experientia 48, A79.

- [118] van Holde, K. E. 1989. Chromatin. Springer Verlag, New York.
- [119] Widom, J. 1989. Annu. Rev. Biophys. Chem. 18:365-395.
- [120] van Holde and Zlatanova. 1995. J. Biol. Chem. 93:8373-8378. 1996. Proc. Natl. Acad. Sci. 93:10548-10555.
- [121] Finch, Klug. 1976. Proc. Natl. Acad. Sci. USA. 73:1897-1901.
- [122] Thoma, F., Th. Koller and A. Klug. J. Cell. Biol. 83:403-427.
- [123] Woodcock, C. L., Grigoryev, S. A., Horowitz, R. A., and Whitaker, N. 1993 : Proc. Natl. Acad. Sci. USA. 90:9021-9025.
- [124] Horowitz et al. 1994. J. Cell. Biol. 125:1-10.
- [125] Leuba et. al. 1994. Proc. Natl. Acad. Sci. USA 91:11621-11625.
- [126] Woodcock, C. L., Grigoryev, S. A., Horowitz, R. A., and Whitaker, N. 1993 : Proc. Natl. Acad. Sci. USA. 90:9021-9025.

- [127] H. Schiessel, W. M. Gelbart, and Robijn Bruinsma, *Biophys J*, April 2001, p. 1940-1956, Vol. 80, No. 4
- [128] G.S. Manning, *J.chem.Phys.*,51,924,934,3249 (1969)
- [129] C.-Y. Shew and A. Yethiraj , *J.chem.Phys.* **106**, 5706 (1997)
- [130] C.-Y. Shew and A. Yethiraj , *J.chem.Phys.*,**113**, 8841 (2000)
- [131] M. Dymitrowska and L. Belloni, *J.chem. Phys.* **109**, 4659 (1998)
- [132] *J.chem.Phys.* **111**, 6633 (1999)
- [133] L. Harnau and P. Reineker, *J.chem.Phys.*,**112**, 437 (2000)
- [134] T.J. Byers and D. Branton *Visualization of the protein associations in the erythrocyte membrane skeleton*. *Proc. Natl. Acad. Sci. USA.* 82:6153-6157 (1985)
- [135] A. Polyakov, *Physics Letters* **103B**, 207 (1981).



- [136] J. Fendler and P. Tundo, *Acc.Chem.Res.* **17**, 3 (1984).
- [137] F. Larche, J. Apell, P. Bassereau, and J. Marignan, *Phys.Rev.Lett.* **56**, 1700 (1986).
- [138] Y. Kantor and D. Nelson, *Phys.Rev.Lett.* **58**, 2774 (1987).
- [139] J. Ambjørn, B. Durhuus, and J. Fröhlich, *Nucl.Phys.* **B257**, 433 (1985).
- [140] F. David, *Nucl.Phys.* **B257**, 543 (1985).
- [141] D. Boulatov, V. Kazakov, I. Kostov, and A. Migdal, *Nuclear Physics* **B275**, 641 (1986).
- [142] R. Renken and R. Kogut, *Nuclear Physics* **B354**, 328 (1991).
- [143] R. Renken and J. Kogut, *Nuclear Physics* **B350**, 554 (1991).
- [144] R. Renken and J. Kogut, *Nuclear Physics* **B342**, 753 (1990).
- [145] T. Onogi, *Physics Letters* **B255**, 209 (1991).

- 
- [146] R. Harnish and J. Wheeler, Nuclear Physics **B350**, 861 (1991).
- [147] M. Baig, D. Espriu, and J. Wheeler, Nuclear Physics **B314**, 587 (1989).
- [148] C. Baillie, R. Williams, S. Catteral, and D. Johnston, Nuclear Physics **B348**, 543 (1991).
- [149] C. Baillie, D. Johnston, and R. Williams, Nuclear Physics **B335**, 469 (1990).
- [150] S. Catteral, Physics Letters **B243**, 121 (1990).
- [151] S. Catteral, Physics Letters **B220**, 207 (1989).
- [152] J. Ambjørn, B. Durhuus, and T. Jonsson, Nuclear Physics **B316**, 526 (1989).
- [153] L. Peliti and S. Leibler, Phys.Rev.Lett. **54**, 1690 (1985).
- [154] W. Helfrich, J.Physique **46**, 1263 (1985).
- [155] D. Förster, Physics Letters **114A**, 115 (1986).
- [156] A. Polyakov, Nucl.Phys. **268B**, 406 (1986).
- [157] J. Ambjørn and B. Durhuus, Phys.Lett. **B188**, 253 (1987).

- [158] J. Ambjørn, B. Durhuus, and T. Jonsson, *Phys.Rev.Lett.* **58**, 2619 (1987).
- [159] J. Ambjørn, B. Durhuus, J. Fröhlich, and T. Jonsson, *Nuclear Physics* **B290**, 480 (1987).
- [160] D. Espriu, *Physics Letters* **194B**, 271 (1987).
- [161] P. Rouse, *J.Chem.Phys.* **21**, 1272 (1953).
- [162] M. Doi and S. Edwards, *The Theory of Polymer Dynamics*, Clarendon Press, Oxford, 1986.
- [163] M. Kalos and P. Whitlock, *Monte Carlo Methods*, volume 1, Wiley, New York, 1986.
- [164] D. Heermann, *Computer Simulation Methods in Theoretical Physics, 2nd ed.*, Springer Verlag, Heidelberg, 1990.
- [165] K. Binder and D. Heermann, *Monte Carlo Simulation in Statistical Physics, Second edition*, Springer-Verlag Heidelberg, 1992.
- [166] C. Munkel and D. Heermann, *J.Physique I* **2**, 2181 (1992).
- [167] M. Challa, D. Landau, and K. Binder, *J.Phys.II* **1**, 37 (1986).

- 
- [168] K. Binder and D. Landau, *Phys.Rev.* **30B**, 1477 (1984).
- [169] P. Peczak and D. Landau, *Phys.Rev.* **39B**, 11932 (1988).
- [170] A. Ferrenberg and R. Swendsen, *Phys.Rev.Let.* **63**, 1195 (1989).
- [171] A. Ferrenberg and R. Swendsen, *Phys.Rev.Let.* **61**, 2635 (1988).
- [172] S. Catteral, D. Eisenstein, J. Kogut, and R. Renken, *Nuclear Physics* **B366**, 647 (1991).
- [173] R. Renken and R. Kogut, *Nuclear Physics* **B348**, 580 (1991).
- [174] M. Fisher, The theory of critical point singularities, in *Proceedings of the International School of Physics 'Enrico Fermi'*, 1971.
- [175] F. Abraham and M. Kardar, *Science* **252**, 419 (1991).
- [176] F. Abraham and D. Nelson, *J.Phys. France* **51**, 2653 (1990).

- [177] F. Abraham and D. Nelson, *Science* **249**, 393 (1990).
- [178] J. Bouchaud and E. Bouchaud, *Phys.Rev.Lett.* **61**, 2625 (1988).
- [179] E. Guitter, F. David, S. Leibler, and L. Peliti, *Phys.Rev.Let.* **61**, 2949 (1988).
- [180] M. Paczuski, M. Kardar, and D. Nelson, *Phys.Rev.Letters* **60**, 2638 (1988).
- [181] Y. Kantor and D. Nelson, *Phys.Rev.* **A36**, 4020 (1987).
- [182] For a review see *Jerusalem Winter School for Theoretical Physics: Statistical Mechanics of Membranes and Surfaces*, edited by D. Nelson, Piran.T., and S. Weinberg (World Scientific, 1989).
- [183] F.F. Abraham and D.R. Nelson, *J. Physique*, **51**, 2653 (1990); *Science*, **249**, 393 (1990)
- [184] M.S. Spector, E. Naranjo, S. Chiruvolu, and J.A. Zasadzinski, *Phys. Rev. Lett.*, **73** (21), 2867 (1994)
- [185] M. Mutz, D. Bensimon, and M.J. Brienne, *Phys. Rev. Lett.*, **67** (7), 923 (1991)

- [186] Y. Kantor, M. Kardar, and D.R. Nelson, Phys. Rev. Lett., **57**, 791 (1986); Phys. Rev. A, **35**, 3056 (1987)
- [187] C. Munkel and D.W. Heermann, J. Physique I, **3**, 1359 (1993); J. Physique I, **2**, 2818 (1992), and references there
- [188] M. Kardar, and D.R. Nelson, Phys. Rev. A, **38**, 966 (1988); J.A. Aronovitz and T.C. Lubensky, Europhys. Lett., **4**, 395 (1987)
- [189] Y. Kantor and D.R. Nelson, Phys. Rev. Lett., **58**, 2744 (1987); Phys. Rev. A, **36**, 4020 (1987).
- [190] F.F. Abraham, W.E. Rudge, and M. Plischke, Phys. Rev. Lett., **62** (15), 1757 (1989).
- [191] J.-S. Ho and A. Baumgärtner, Phys. Rev. Lett., **63**, 1324 (1989)
- [192] M. Plischke and D. Boal, Phys. Rev. A, **38**, 4943 (1988)
- [193] F.F. Abraham and M. Kardar, Science, **252**, 419 (1991).
- [194] B. Mehlig, D.W. Heermann, and B.M. Forrest, Phys. Rev. B, **45** (2), 679 (1992).

- [195] S. Duane, A.D. Kennedy, B.J. Pendleton, and D. Roweth, *Phys. Let. B*, **195** (2), 216 (1987).
- [196] P. Peczak and D.P. Landau, *Phys. Rev. B*, **39** (16), 11932 (1988).
- [197] M.S.S. Challa, D.P. Landau, and K. Binder, *J. Physique II*, **1**, 37 (1986).
- [198] K. Binder and D.P. Landau, *Phys. Rev. B*, **30** (3), 1477 (1984).
- [199] V. Privman, *Finite Size Scaling and Numerical Simulation of Statistical Systems*, (World Scientific, Singapore, 1990).
- [200] M.N. Barber, in *Phase Transitions and Critical Phenomena, Vol.8*, (Academic Press London, 1983).
- [201] E. Brezin, *J. Physique*, **43**, 15 (1982).
- [202] M.E. Fisher and M.N. Barber, *Phys. Rev. Lett.*, **28** (23), 1516 (1972).
- [203] S. Kappler and C. Borgs, *Int. J. of Mod. Phys. C*, **3** (5), 1099 (1992).

- [204] C. Borgs and Kotecký, Phys. Rev. Lett., **68**, 1734 (1992).
- [205] C. Borgs and Kotecký, J. Stat. Phys., **61**, 79 (1990).
- [206] J. Lee and J.M. Kosterlitz, Phys. Rev. Lett., **65** (2), 137 (1990).
- [207] A.M. Ferrenberg and R.H. Swendsen, Phys. Rev. Lett., **63** (12), 1195 (1989).
- [208] P. DiFrancesco and Gutter E, Phys. Rev. E., **50**, 4418 (1994).
- [209] S. Grothans and R. Lipowsky, Phys. Rev. A, **41** (8), 4574 (1990).
- [210] P. E. Rouse, A theory of the linear viscoelastic properties of dilute solutions of coiling polymers, J. Chem. Phys. **21**, 1272 (1953)
- [211] M. Doi and S. F. Edwards, *Theory of Polymer Dynamics* (Wiley, New York, Oxford, 1987).
- [212] K. Kremer and G. S. Grest, J. Chem. Phys. **92**, 5057 (1990).



- [213] W. Paul, K. Binder, D. W. Heermann, and K. Kremer, *J. Chem. Phys.* **95**, 7726 (1991).
- [214] W. Paul, K. Binder, D.W. Heermann, and K. Kremer, *J. Phys. II* **1**, 37 (1991).
- [215] W. Paul, K. Binder, K. Kremer, and D.W. Heermann *Macromolecules* **24**, 6332 (1991).
- [216] W. Paul, K. Binder, D.W. Heermann, and K. Kremer, *J. Chem. Phys.* **95** 10, 7726 (1991).
- [217] D. Rigby and R. J. Roe, *J. Chem. Phys.* **87**, 7285 (1987).
- [218] K.M. Zimmer, A. Linke, D.W. Heermann, J. Bachtoulis, and Th. Bürger, *submitted to Makromol. Chem., Theory Simul.* (1996).
- [219] M. Doi and S.F. Edwards, *Theory of Polymer Dynamics* Wiley, New York, 1987).
- [220] P.E. Rouse, *J. Chem. Phys.* **21**, 1272 (1953).
- [221] G. Schöppe, K.M. Zimmer, and D.W. Heermann *to be published 1996*.
- [222] E. Macho, A. Allegria, and J. Colmenero, *Polym. Eng. Sci.* **27**, 810 (1987).

- [223] K. Kremer, G.S. Grest, and I. Carmesin, *Phys. Rev. Lett.* **61**, 566 (1988).
- [224] K. Kremer and G.S. Grest, *J. Chem. Phys.* **92**, 5057 (1990).
- [225] J. Wittmer, W. Paul, and K. Binder, *Macromolecules* **25**, 7211 (1992).
- [226] M. Bishop et. al. (1979)M. Bishop, M.H. Kalos, and H.L. Frisch (1979): *J. Chem. Phys.* **70**, 1299
- [227] P. G. de Gennes (1979)P. G. de Gennes (1979): *Scaling Concepts in Polymer Physics* Cornell University Press, London
- [228] P.J.Flory, in Principles of Polymer Chemistry, Cornell Univ. Press, Ithaca 1953
- [229] M.Gordon and G.R.Scantlebury, *J.Polym.Sci.* C16, 3933 (1968)
- [230] D.R.Miller and C.W.Macosko, *Macromolecules* 13, 1063 (1980)
- [231] M. Rubinstein, *Phys. Rev. Lett.* **59**, 1946 (1987)
- [232] M. Widom I. Al-Lehyani (1997)

- [233] S.A. Kauffman, The large scale structure and dynamics of genetic control circuits: an ensemble approach. *Journal of Theoretical Biology*, 44, 167-190 (1974)
- [234] S.A. Kauffman, The origins of order: Self-organization and selection in evolution. Oxford University Press, New York (1993)
- [235] S. Low, D. Lapsley, Optimization flow control, i: Basic algorithm and convergence, *IEEE/ACM Transactions on Networking*, 1999
- [236] R. Thomas, ed., *Kinetic Logic: A Boolean approach to the analysis of complex regulatory systems*, Lecture Notes in Biomathematics, Springer Verlag, 29 (1979).
- [237] Y. Kanada, The effects of randomness in asynchronous 1D cellular automata, *Proceedings of ALIFE IV*, 1994.
- [238] I. Harvey, T. Bossomaier, Time out of joint: attractors in asynchronous random Boolean networks, *Proceedings of the Fourth European Conference on*

Artificial Life (ECAL97), MIT Press, 1997, p. 65-75.

[239] S. Wolfram, A new kind of science, Wolfram Media, Champaign, 2002, p. 51-114

# Index

- $\nu$ , critical exponent, 19
- theta*-temperature, 56
- binodal, 55
- polymerization index, 210
- additive functions, Boolean network, 224
- alpha-helix, 71
- alternating copolymer, 13
- AMBER, 98
- amino acid, 11
- annealed model, Boolean network, 222
- ARBN, asynchronous random boolean networks, 222
- Arrhenius law, 103
- asynchronous random boolean networks, 222
- attractor, 222, 230
- basin of attraction, 222, 230
- Bayesian parameter estimation, 219
- Bayesian network, 218
- bending modulus, 27
- beta distribution, 220
- binomial distribution, 219
- Bjerrum length, 65
- blob, 137
- block copolymer, 13
- bond angle, 15
- Boolean network, 221
- carbohydrate, 11
- Cayley-tree, 207
- chain length, 14
- CHARMM, 98
- closed dynamically trian-

- gulated random surfaces, 161
- co-polymer, 42
- coexistence curve, 55
- conformation, 14
- connectivity constant, 35
- contour length, 14
- copolymer, alternating, 13
- copolymer, block, 13
- copolymer, graft, 13
- copolymer, random, 13
- copolymers, 12
- critical concentration, 55
- critical temperature, 55
- curvature, 30
- cycle of steady states, 222
- cytoskeletal network, 95
  
- Debye length, 89
- degree of polymerization, 14
- designability, 113
- detailed balance, 104, 262
  
- dice, 219
- dielectric constant, 64
- dielectric screening, 65
- diffusion matrix, 103
- dipole moment, 66
- divalent ions, 64
- DNA melting, 78
  
- edge extrinsic curvature, 161
- Edwards-Hamiltonian, 184
- effective number of repeat units, 19
- electrolyte, 85
- electronic charge, 85
- electrostatic blob size, 90
- end-to-end distance, 17
- equal weight ensemble, Boolean network, 224
  
- Flory-Huggins parameter, 52
- Flory-Huggins theory, 48
- forcing functions, Boolean network, 224

- 
- freely jointed chain model,  
17
- Gaussian curvature, 155
- gel point, 210
- gel-electrophoresis, 213
- glucose, 11
- glycosidic bond, 11
- graft copolymer, 13
- GROMOS, 98
- Hamming distance, 225
- helix-coil transition, 71
- heteropolymer, 42
- homopolymer, 42
- homopolymers, 12
- HP Model, 110
- Hybrid Monte-Carlo, 106
- importance sampling, 262
- Ising model, 52
- Kuhn length, 19
- L-S-Model, 118
- Langevin Dynamics, 102
- Langevin equation, 103
- Langevin function, 28, 137
- Langevin-Gleichung, 181
- limit cycles, 230
- Liouville theorem, 100
- macromolecule, 9
- magnetization biased, Boolean  
network, 224
- Manning parameter, 89
- Markov chain, 119, 259
- Markov-Prozess, 182
- Mastergleichung, 179
- mathematical curve, 30
- maximum likelihood method,  
220
- metastable, 55
- microscopic reversibility,  
262
- mobility matrix, 185
- Molecular Dynamics, 99
- Molecular Dynamics (MD),  
99

- monkey saddle, 157  
monomer, 9  
monosaccharide, 11  
native conformation, 91  
network, cytoskeletal, 95  
normal curvatures, 155  
nucleic acids, 12  
Nucleotides, 11  
NVT Monte-Carlo Algorithm, 265  
one-phase region, 53  
Oseen tensor, 185  
osmotic pressure, 55  
parameter estimation, Bayesian, 219  
permittivity of free space, 65  
persistence length, 19  
Peyrard-Bishop model, 85  
pivot algorithm, 119  
Poisson-Boltzmann equation, 88  
Poland-Scheraga-model, 79  
polyelectrolyte, 85  
Polyhydroxyalkanoate (PHA), 12  
polypeptide, 11  
principal curvatures, 155  
probit, 239  
protein, 91  
quenched model, Boolean network, 222  
radius of gyration, 20  
random copolymer, 13  
random energy model, 42  
Reibung, 181  
REM, random energy model, 42  
repeating unit, 9  
repton model, 213  
Riemann Zeta-function, 229  
rotamer, 91  
Rouse dynamics, 186  
self-avoiding random walk,



- 119
- self-organisation, 237
- spectrin network, 159
- Spektraldichte einer Zufallsvari-  
ablen, 181
- spinodal, 53
- steady state, 222
- stochastische Kraft, 181
- symplectic, 99
- symplectic, 101
- Taylor expansion, 101
- torsion, 30
- transition probabilities, 104
- transition probability, 259,  
262
- triad, 30
- univalent ions, 64
- valency, 85
- Van der Waals interactions,  
68
- Verlet algorithm, 102
- Wiener process, 103
- worm-like chain model, 25
- Yamakawa, 19
- zipper-model, 81