Themen

(in der ursprünglichen Reihenfolge)

1. Landau Theorie
[1, Kap. 10, S. 167-172], [2, Kap. 4, S. 236-254], [3, Kap. XIV, Par. 138, S. 429-433], [4, Kap. 2.3, S. 25-28], [5, Kap. 14.d, S. 318-323]

2. Klassisches Ising- und Heisenberg-Modell in $D = 1$
[6, Kap. 5.II, S.181-205], [1, Kap. 8.2, S. 115-124], [1, Kap. 8.5, S. 131-133], [2, Kap. 3, S. 218-221], [7, Kap. 14.6, S. 361-363], [8, Kap. 2, S. 32-38]

3. Ising-Modell in $D = 2$: Peierls Argument und Kramers-Wannier-Dualität
[9, Kap. III, S. 250-255], [10, Kap. 2.V.A, S. 59-65], [11], [7, Kap. 14.3, S. 349-352], [12, Kap. 7.II.A, S. 271-278], [7, Kap.14, S. 365-367], [13, Kap. 8.6, S. 229-241]

4. Ising-Modell in $D = 2$: Exakte Lösung
[1, Anh. B, S. 265-271], [3, Kap. XIV, Par. 141, S. 447-454], [7, Kap. 15, S. 368-391],

5. Berlin-Kac-Modell
[14], [15, Kap. 10.II, S. 379-387], [1, Kap. 8.4, S. 128-131], [16], [17, Kap. 30, S. 290-302]

6. Quantenmechanisches XY- und Heisenbergmodell in $D = 1$
[6, Kap. III, S. 205-225], [18], [19]

7. Dimer-Problem
[20, Kap. 5, S. 230-248] [21, Kap. VI, S. 295-301], [22], [23], [24], [25], [27]

8. ϕ^4-Modell I: Störungsrechnung und Hopping-Parameter-Entwicklung
[28, Kap. 1.4, S. 16-26], [28, Kap. 1.5.1, S. 26-29], [28, Kap. 2.1, S. 54-58], [28, Kap. 2.3, S. 74-77]

9. ϕ^4-Modell II: Zufallspfadentwicklung
[29, Kap. 2.3, S. 32-37], [30, Kap. 6, S. 101-115], [31]

10. Perkolation und Anwendungen
[32], [33]

11. Heisenbergmodell und Infrarotschranke
[29, Kap. 2.2.3, S. 27-31]

12. Selbstorganisierte Kritikalität und Sandhaufen
[34], [35], [36], [37], [38]

13. Korrelationsungleichungen
[29, Kap. 2.1.5, S. 23-25], [39, Kap. 4, S. 57-65]

14. Bose-Einstein-Kondensation
[13, Kap. 6.7.2, S. 150-156] [41]

Literatur

[1] H. E. Stanley, Introduction to Phase Transitions and Critical Phenomena, Oxford Science Publications 1971, Hb124

[2] M. R. H. Khajehpour, Introductory Lectures on Critical Phenomena, Lahore Konferenz 1987, Path Integral Method, Lattice Gauge Theory and Critical Phenomena, World Scientific, Editor A. Shaukat, DESY Bibliothek 11732

[3] L. D. Landau, E. M. Lifschitz, Statistical Physics, Pergamon Press 1968, Ab17V3

[4] P. Pfeuty, G. Toulouse, Introduction to the Renormalization Group and to Critical Phenomena, John Wiley 1977, Hb85

[5] W. Weidlich, Thermodynamik und Statistische Mechanik, Akademische Verlagsgesellschaft 1976, Hb93

[6] C. J. Thompson, One-dimensional Models - Short Range Forces, Phase Transitions and Critical Phenomena, Vol. 1, ed. C. Domb, M. S. Green, , Academic Press 1972, 22 Dom/1 1972

[7] K. Huang, Statistical Mechanics, John Wiley 1987

[8] R. J. Baxter, Exactly Solved Models in Statistical Mechanics, Academic Press 1982

[9] R. B. Griffiths, Phase Transitions, Les Houches Summerschool of Theoretical Physics 1970, Statistical Mechanics and Quantum Field Theory, ed. C. De Witt, R. Stora, Gordon and Breach Science Publishers 1971, Lc176

[10] R. B. Griffiths, Rigorous Results and Theorems, Phase Transitions and Critical Phenomena, Vol. 1, ed. C. Domb, M. S. Green, , Academic Press 1972, 22 Dom/1 1972

[11] R. B. Griffiths, Peierls Proof of Spontaneous Magnetization in a Two-Dimensional Ising Ferromagnet, Phys. Rev. Vol. 136, No. 2A, 1964, 437-439

[12] I. Syozi, Transformation of Ising Models, Phase Transitions and Critical Phenomena, Vol. 1, ed. C. Domb, M. S. Green, , Academic Press 1972, 22 Dom/1 1972

[13] H. Römer, T. Filk, Statistische Mechanik, VCH Verlag 1994, Hb135

[14] T. H. Berlin, M. Kac, The Spherical Model of a Ferromagnet, Phys. Rev. Vol. 86, No. 6, 1952, 821-835

[15] G. S. Joyce, Critical Properties of the Spherical Model, Phase Transitions and Critical Phenomena, Vol. 2, ed. C. Domb, M. S. Green, , Academic Press 1972, 22 Dom/2 1972

[16] H. E. Stanley, Spherical Model as the Limit of Infinite Spin Dimensionality, Phys. Rev. Vol. 176, No.2, 1968, 718-722

[17] L. S. Schulman, Techniques and Applications of Path Integration, John Wiley, 1981

[18] E. Lieb, T. Schultz, D. Mattis, Two Soluble Models of an Antiferromagnetic Chain, Ann. Phys. 16, 407-466 (1961)

[19] E. Lieb, D. Mattis, Mathematical Physics in One Dimension, Academic Press 1966, La114

[20] E. W. Montroll, Lectures on the Ising Model of Phase Transitions, Brandeis Lectures on Statistical Physics, Phase Transitions, and Superfludidity, Vol. 2 (1966) Gordon and Breach Science Publishers, M. Chrétien, E. P. Gross, and S. Deser ed., Ag 2 VII 2

[21] E. Lieb, Models in Statistical Mechanics, Statistical Mechanics and Quantum Field Theory, ed. C. De Witt, R. Stora, Gordon and Breach Science Publishers 1971, Lc176

[22] E. Lieb, Solution of the Dimer Problem by the Transfer Matrix Method, Jour. Math. Phys. Vol. 8, No. 12, 1967, 2339-2341

[23] P. W. Kasteleyn, Dimer Statistics and Phase Transitions, Jour. Math. Phys. Vol. 4, No. 2, 1963, 287-293

[24] M. E. Fischer, Statistical Mechanics of Dimers on a Plane Lattice, Phys. Rev. Vol. 124, No. 6, 1961, 1664-1672

[25] M. E. Fischer, On the Dimer Solution of Planar Ising Models, Jour. Math. Phys. Vol. 7, No. 10, 1966, 1776-1781

[26] A. E. Ferdinand and M. E. Fisher, Bounded and Inhomogeneous Ising Models. I. Specific Heat Anomaly of a Finite Lattice, Phys. Rev. Vol. 185, No. 2 (1969) 832-846

[27] I. Pessando, The Dimer Partition Function, HEP-LAT/9303015

[28] I. Montvay, G. Münster, Quantum Fields on a Lattice, Cambridge Monographs on Mathematical Physics 1994

[29] H. Grosse, Models in Statistical Physics and Quantum Field Theory, Trieste Notes in Physics, Springer 1988

[30] R. Fernandez, J. Fröhlich, A. D. Sokal, Random Walks, Critical Phenomena, and Triviality in Quantum Field Theory, Texts and Monographs in Physics, Springer 1992

[31] D. C. Brydges, J. Fröhlich, A. D. Sokal, The Random Walk Representation of Classical Spin Systems and Correlation Inequalities, Commun. Math. Phys. 91, 1983, 117-139

[32] D. Stauffer, A. Aharony, Introduction to Percolation Theory, Taylor and Francis 94

[33] J. W. Essam, Percolation and Cluster Size, Phase Transitions and Critical Phenomena, Vol. 2, ed. C. Domb, M. S. Green, , Academic Press 1972, 22 Dom/2 1972

[34] P. Bak, M. Creutz, Fractals and Self-Organized Criticality, Fractals in Science, ed. A. Bunde, S. Havlin, Springer 1994

[35] D. Dhar, Self-Organized State of Sandpile Automaton Models, Phys. Rev. Let. Vol. 64, No. 14, 1990, 1613-1616

[36] K. Chen, P. Bak, Self-Organized Criticality in a Crack-Propagation Model of Earthquakes, Phys. Rev. A, Vol. 43, No. 2, 1991, 625-630

[37] P. Bak, C. Tang, K. Wiesenfeld, Self-Organized Criticality: An Explanation of $1/f$ Noise, Phys. Rev. Let. Vol. 59, No. 4, 1987, 381-384

[38] P. Bak, C. Tang, K. Wiesenfeld, Self-Organized Criticality, Phys. Rev. A, Vol. 38, No. 1, 1988, 364-374

[39] J. Glimm, A. Jaffe, Quantum Physics, A Functional Point of View, Springer 1987

[40] W. Gebhard, U. Krey, Phasenübergänge und kritische Phänomene, Vieweg 1980, Ha52

[41] M. H. Anderson et al., Observation of Bose-Einstein-Kondensation, Science 269 (1995) 198