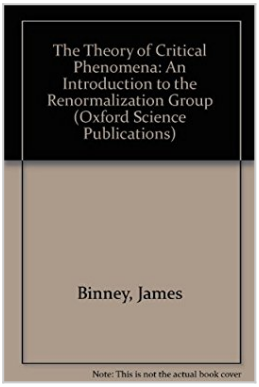

The Theory of Critical Phenomena: An Introduction to the Renormalization Group (Oxford Science Publications)

By J. J. Binney, N. J. Dowrick, A. J. Fisher, M. E. J. Newman

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The successful calculation of critical exponents for continuous phase transitions is one of the main achievements of theoretical physics over the last quarter-century. This was achieved through the use of scaling and field-theoretic techniques which have since become standard equipment in many areas of physics, especially quantum field theory. This book provides an introduction to these techniques. Continuous phase transitions are introduced, then the necessary statistical mechanics is summarized, followed by standard models, some exact solutions and techniques for numerical simulations. The real-space renormalization group and mean-field theory are then explained and illustrated. The final chapters cover the Landau-Ginzburg model, from physical motivation, through diagrammatic perturbation theory and renormalization to the renormalization group and the calculation of critical exponents above and below the critical temperature.

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Editorial Review

Review

"Provides a thorough introduction to the use of scaling and field-theoretic techniques that have become standard equipment in many areas of physics, especially quantum field theory. Intended for beginning graduates students, especially those with background in physics but no knowledge of quantum field theory (jargon is kept to a minimum)." --*SciTech Book News*

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"The book is written very clearly and simply, which makes it accessible to anyone who passed the principle undergraduate physics courses."--*Journal of Statistical Physics*

About the Author
J. J. Binney is at Oxford University.

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