

# Contents

Contributors .. .. .	v
General Preface .. .. .	vii
Preface to Volume 7 .. .. .	ix

## 1. Defect-mediated Phase Transitions

D. R. NELSON

I. Introduction .. .. .	2
II. The XY Model and Superfluidity in Two Dimensions .. .. .	11
III. Dynamic Scaling and Third Sound in Helium Films .. .. .	31
IV. Statistical Mechanics of Two-dimensional Melting .. .. .	40
V. Melting Dynamics .. .. .	66
VI. Anisotropic Melting .. .. .	74
VII. Line Singularities in Three Dimensions .. .. .	83
Acknowledgements .. .. .	93
References .. .. .	93

## 2. Conformational Phase Transitions in a Macromolecule: Exactly Solvable Models

F. W. WIEGEL

I. Introduction .. .. .	101
II. Adsorption to a Surface .. .. .	104
III. Helix-Coil Transitions .. .. .	109
IV. Crystallization by Folding .. .. .	121
V. Entanglements .. .. .	131
Acknowledgements .. .. .	147
References .. .. .	147

## 3. Dilute Magnetism

R. B. STINCHCOMBE

I. Introduction .. .. .	152
II. Qualitative Features .. .. .	154
III. Exact Results and Exactly Soluble Models .. .. .	174

IV. Monte Carlo and Simulation Results .. .. .	202
V. Closed Form Approximations .. .. .	210
VI. Series Expansion Investigations .. .. .	223
VII. Scaling and Renormalization Group Methods for Dilute Magnets ..	232
VIII. Selected Experimental Results and Comparison with Theory ..	262
References .. .. .	270
Author Index .. .. .	281
Subject Index .. .. .	290