

Contents

1	Introduction	1
	References	3

Part I Model Systems in Statistical Physics

2	Ising-type Antiferromagnets:	
	Model Systems in Statistical Physics	7
2.1	Uniaxially Anisotropic Antiferromagnets with Localized Moments.....	7
2.2	Lee–Yang Theorem	9
2.3	Lee–Yang Zeros and Thermodynamics	12
2.4	Experimental Access to the Density of Lee–Yang Zeros	17
2.5	Yang–Lee Edge Singularities	25
2.6	Modern Approaches Beyond the Lee–Yang Theory.....	30
	2.6.1 Fisher Zeros	30
	2.6.2 Zeros of the Partition Function in the Case of First-Order Phase Transitions	32
	References	37

Part II Exchange-Bias

3	Ferromagnetic Thin Films for Perpendicular and Planar Exchange-bias Systems	43
3.1	Anisotropy	43
3.2	Thin-film Growth on Antiferromagnetic Single Crystals.....	47
	References	53
4	Exchange Bias in Magnetic Heterosystems	55
4.1	A Generalized Meiklejohn–Bean Approach	55
4.2	Perpendicular Anisotropic Heterostructures with Uncompensated Interfaces	64

4.2.1	Influence of the Pinning Layer Susceptibility	64
4.2.2	Exchange Bias in $\text{FeF}_2(001)/\text{CoPt}$	66
4.2.3	Domain-state Susceptibility in $\text{FeCl}_2/\text{CoPt}$ -Heterostructures	79
4.3	Heterostructures with Planar Anisotropy and Compensated Interfaces	88
4.3.1	Piezomagnetic Origin of Exchange Bias	88
4.3.2	Dilution Controlled Temperature Dependence of Exchange Bias	97
4.3.3	Training Effect	102
	References	109
5	Summary	113
	Index	115