



Nanomagnetism

Edited by

A. Hernando

NATO ASI Series

Series E: Applied Sciences - Vol. 247

2-530-113-1

2-530-113-1

Nanomagnetism

2010-010A 0001

2010-010A 0001

2010-010A 0001
2010-010A 0001

2010-010A 0001
2010-010A 0001

2010-010A 0001
2010-010A 0001

2010-010A 0001
2010-010A 0001

2010-010A 0001
2010-010A 0001
2010-010A 0001

2010-010A 0001
2010-010A 0001



2010-010A 0001

CONTENTS

Preface

xi

I. INTRODUCTION TO NANOMAGNETIC DEVICES

C. E. Yeack-Skranton <i>"Desiderata of Storage Devices"</i>	1
J. Miltat and A. Thiaville <i>"Bloch-Line Storage Potential"</i>	7
E. Meier, A. Vaterlaus, J.C. Gröbli and D. Guarisco <i>"Time-Resolved Experiments in Magnetism"</i>	19
O.V. Nielsen, B. Hernando, G. Herzer and P. Spisak <i>"Nanocrystalline Materials as the Magnetic Core in High-Performance Fluxgate Sensors"</i>	27

II. THIN FILMS

B. Heinrich, Z. Celinski and J.F. Cochran <i>"FMR and Smoke Studies of Bilinear and Biquadratic Exchange Coupling in BCC Fe/Cu, Ag/Fe Trilayers. The effect of in-plane four-fold anisotropies on Magnetization reversal"</i>	33
N. García and A. Hernando <i>"The Ruderman-Kittel-Kasuya-Yosida Spin Polarization in Finite Systems: Long Range Antiferromagnetic Polarization"</i>	49
P.A. Grünberg, A. Fuß, Q. Leng, R. Schreiber and J.A. Wolf <i>"Interlayer Coupling and its Dependence on Growth and Structure"</i>	59
A.S. Arrott <i>"Origins of Hysteresis in Ultra Thin Films"</i>	73

III. SMALL PARTICLES, CLUSTERS AND NANOCRYSTAL

A. Berkowitz, R. Kodama, S. Slade and F. Spada <i>"Fine Particle Synthesis by Spark Erosion"</i>	87
S. Morup <i>"Studies of Superparamagnetism in Samples of Ultrafine Particles"</i>	93
S. Gangopadhyay, A. Tsoukatos, G.C. Hadjipanayis, C.M. Sorensen, K.J. Klabunde <i>"Magnetism on Nanocrystalline Materials"</i>	101
G. Herzer <i>"Nanocrystalline Soft Magnetic Materials"</i>	111
H. Kronmüller and T. Schrefl <i>"Basic Magnetic Properties of Nanocrystalline Particles and Particle Ensembles"</i>	127
A. Slawska-Waniewska, M. Gutowski, M. Kuzminski, H. Lachowicz, T. Kulik. <i>"Variety of Magnetic Phases in Nanocrystalline Fe-based Metallic Glasses"</i>	145

IV. TUNNELING EFFECTS

L. Gunther <i>"Quantum Tunneling of Magnetization"</i>	153
J. I. Arnaudas, A. Del Moral, C. de la Fuente <i>"Mesoscopic Quantum Tunneling in Amorphous Magnets with Strom Random-Axis Anisotropy"</i>	167

V. MAGNETOSTRICTION

M.R.J. Gibbs

"Effect of Domain Structure on Magnetostrictive Response in Amorphous Ferromagnets"

179

L. Lannote

"Co-P Layers and Multilayers Produced by Electrolytical Deposition: Structure, Magnetic and Magnetoelastic Properties"

185

E. Hristoforou and D. Niarchos

"Sensors Based on Amorphous Alloys"

201

K. Zaveta and Z. Kalva

"Permeability and Domain Structures in Soft Nanocrystalline Materials"

207

R. Grössinger and R. Sato Turtelli

"Characterisation of the Amorphous State of Fe_{73.5}Cu₁Nb₃Si_{13.5}B₉"

215

Index

225