

Contents

Foreword	vii
Preface	ix
Part 1: Quantum Hall Effect	
The Electron Gas Between Two and Three Dimensions <i>B.I. Halperin</i>	3
Chaos in the Lowest Landau Level <i>V.J. Emery</i>	16
Complex Dynamics of the Integer Quantum Hall Effect <i>S.A. Trugman and V.N. Nicopoulos</i>	25
Field Theory of the Fractional Quantum Hall Effect <i>E. Fradkin</i>	41
Numerical Approaches to the Integer Quantum Hall Effect <i>R. Bhatt</i>	65
A Cluster Exchange Theory of the Fractional Quantum Hall Effect <i>W.P. Su</i>	79
Low-Dimensional Organic Conductors in High Magnetic Fields <i>J.S. Brooks</i>	87

Contributed Papers

Edge States and Quasi Particles in the Fractional Quantum Hall Effect
M.D. Johnson and A.H. MacDonald 102

Current Flow in the Integer Quantum Hall Effect
 O. Heinonen 112

Electrons in Magnetic Fields: Dimensional Crossover and Dissipation
 I.D. Vagner 119

Part 2: Heavy-Fermion Systems

The Problem of Weak Antiferromagnetism in Heavy Fermions
 L.P. Gor'kov 133

Heavy Electron Metals and Insulators
 A.J. Millis 146

Heavy Fermions: Effective Hamiltonian from Local and Pair-Wise Interactions
 C. Varma 156

Heavy Fermion Phase Transitions and Quantum Critical Phenomena
 S. Doniach 164

Neutron Scattering and High Field Experiments on Kondo Metals and Insulators
G. Aeppli, E. Bucher, and T.E. Mason 175

The Use of (Large) Magnetic Fields in Spin-Glass and Heavy-Fermion Physics
 J.A. Mydosh 184

Heavy Fermion Materials at High Magnetic Fields
 Z. Fisk and J.D. Thompson 197

Contributed Papers

Magnetic Oscillations in UBe_{13}
G.M. Schmiedeshoff, Z. Fisk, and J.L. Smith 209

*Magnetic Field Response of U-based Heavy-Fermion
 Antiferromagnets: UCd_{11} and U_2Zn_{17}*
B. Andraka, G.R. Stewart, and Z. Fisk 214

Part 3: Superfluidity, Superconductivity and Cuprate
Related Problems

High Magnetic Fields and Ultralow Temperatures in
 Superfluid ^3He
A.J. Leggett 225

The Superfluid Transition in a Polarized Fermi-gas With
 Repulsion
A. Chubukov and M.Yu. Kagan 239

Functional Integral Approach to Strongly Interacting
 Fermions in High Magnetic Fields
W. Brenig, A. Kampf, H. Monien and J.R. Schrieffer 253

Calculation of the Spectral Weight Function for Interacting
 Electrons
J. Callaway, Qiming Li, and Lun Tan 264

The Derivation of Effective Spin Hamiltonians and the
 Origin of the Magnetic Field Induced Transition in
 Orthorhombic La_2CuO_4
D. Coffey 279

Thermodynamic and Transport Properties of
 Superconductors in Very High Magnetic Fields
M. Rasolt 292

Superconductivity at High Magnetic Fields: Fluctuations
 Near $H_{c2}(T)$
Z. Tešanović 311

Landau Quantization and Superconductivity at High
 Magnetic Fields
M.R. Norman, H. Aker, and A.H. MacDonald 326

Quantum Interference in Superconducting Wire Networks and Josephson Junction Arrays in Magnetic Fields <i>F. Nori and Q. Niu</i>	334
Contributed Papers	
<i>Quasi-particle Spectrum and the Effect of Spin Paramagnetism in Very High Field Superconductivity</i> <i>V.N. Nicopoulos and P. Kumar</i>	353
<i>Hole Motion in a Quantum Antiferromagnet Under the Influence of the Zeeman Interaction</i> <i>E. Manousakis</i>	358
<i>Single-hole State in the 2D t-J Model in a Transverse Magnetic Field</i> <i>C.F. Lo, E. Manousakis, and Y.L. Wang</i>	366
<i>The Electronic Structure of High-T_c Cuprates Close to E_F: Experimental and Theoretical Indications</i> <i>J. Ashkenazi</i>	373
<i>Application of Muon Spin Relaxation Experiments to Mixed State Superconductors</i> <i>M. Inui and D.R. Harshman</i>	380
<i>Universality of the Irreversibility Line</i> <i>S.P. Obukhov and M. Rubinstein</i>	384
<i>Flux Dynamics in a Single Crystal of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_x$</i> <i>D. Shi, X.S. Ling, and J.I. Budnick</i>	389
<i>Low Temperature Flux Creep in High-T_c Superconductors</i> <i>V.M. Vinokur, M.V. Feigel'man, V.B. Geshkenbein, A. Umezawa, Ming Xu, and G.W. Crabtree</i>	395
<i>Determination of the Upper and Lower Critical Fields of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ from the Logarithmic Field Dependence of the Magnetization</i> <i>U. Welp, S. Fleshler, W.K. Kwok, K.G. Vandervoort, J. Downey, B. Veal, and G.W. Crabtree</i>	403

deHaas-vanAlphen and Fermi Surface Studies of Organic Superconductors (ET)₂X
J. Wosnitza, G.W. Crabtree, H.H. Wang, K.D. Carlson, and J.M. Williams 411

Polarization of ³He-⁴He Mixtures by the Castaing-Nozières Effect
L.P. Roobol, S.C. Steel, R. Jochemsen and G. Frossati 421

The Interplay Between Superconductivity and Landau Quantization
T. Maniv, A.I. Rom, R.S. Markiewicz, I.D. Vagner and P. Wyder 425

Part 4: Molecular and Biological Systems

Radical Pair Reaction Dynamics in Large Magnetic Fields: Application to the Initial Intermediate in Photosynthesis
Steven Boxer 437

Time Reversal Symmetry Breaking in Biological Molecules
S. Doniach, A. Kapitulnik, P. Frank, M.M. Fejer, S. Spielman, and J.S. Dodge 452

Complex Fluids and Biological Suspensions in High Magnetic Fields
G. Maret 458

Contributed Papers

Alignment of Lyotropic Liquid Crystalline Phases of DNA Using High Magnetic Fields
D.H. VanWinkle, M.W. Davidson, and R.L. Rill 469

Part 5: Itinerant and Spin Magnetism

One-Dimensional Correlated Electrons and Magnetic Field Effects
H. Shiba, T. Sugiyama, and M. Ogata 481

Contributed Papers

<i>Current-Density Functional Theory of Electronic Systems at High Magnetic Field</i> <i>G. Vignale, P. Skudlarski and M. Rasolt</i>	495
<i>Some Universal Properties of One-Dimensional Systems With $SU(N)$-Symmetry</i> <i>P. Schlottmann</i>	502
<i>(1+1)-Dimensional $O(3)$ Nonlinear Sigma Model in a Magnetic Field: Magnetization and Effective Potential</i> <i>N. Nicopoulos and <u>A.M. Tselik</u></i>	508
<i>Requirements for the Observation of Fermi Surfaces in Disordered Alloys</i> <i><u>J.S. Faulkner</u> and G.M. Stocks</i>	518
<i>Linked Cluster Expansion</i> <i><u>Yung-Li Wang</u>, Kok-Kwei Pan, and C.D. Wentworth</i>	526
<i>The Ising Model in $1 < d \leq 2$</i> <i>M.A. Novotny</i>	533

Part 6: High Magnetic Field Facilities

<i>The Amsterdam High Field Facility: Research and Future Plans</i> <i><u>J.J.M. Franse</u>, F.R. de Boer, P.H. Frings, R. Gersdorf, W.C.M. Mattens, and L.W. Roeland</i>	539
<i>High Field Facilities at Grenoble: Research Areas in Condensed Matter Physics</i> <i>G. Martinez</i>	567
<i>The National High Magnet Field Laboratory: The Pulsed Magnetic Field Facility at Los Alamos National Laboratory</i> <i>F. Mueller</i>	579

Solid State Physics in Pulsed High and Ultra-high Magnetic Fields <i>N. Miura</i>	589
Present Status of the High Field Laboratory at Sendai: Facilities and Highlights of Research <i>Y. Nakagawa</i>	604
Part 7: Summary	
Physical Phenomena at High Magnetic Fields: Conference Summary <i>E. Abrahams</i>	621
List of Speakers and Poster Contributors	627

In the case of papers with multiple authorship, the underlined author presented the paper at the Conference.