



Contents

Part I	Large-Scale Magnetic Fields in Galaxies	
<hr/>		
Interstellar Magnetic Fields – Past, Present and Future By R. Beck (With 3 Figures) . . . . .		2
Dynamo Excitation in Very Large Scales By F. Krause (With 4 Figures) . . . . .		8
Magnetic Fields of Galaxies. By A. Ruzmaikin (With 5 Figures) . . .		16
Bisymmetric Spiral Magnetic Fields in Spiral Galaxies By M. Fujimoto (With 6 Figures) . . . . .		23
Global Structure of Magnetic Fields in Spiral Galaxies By Y. Sofue (With 3 Figures) . . . . .		30
Rotation Measures and Depolarization near the Minor Axis in M31. By E.M. Berkhuijsen, R. Beck, and R. Gräve (With 4 Figures) . . . .		38
High Resolution Polarization Observations of M31 By N. Loiseau, E. Hummel, R. Beck, and R. Wielebinski (With 2 Figures) . . . . .		42
The Magnetic Field in IC 342 By R. Gräve and R. Beck (With 4 Figures) . . . . .		47
High Resolution Observations of Linearly Polarized Emissions of IC 342. By M. Krause, E. Hummel, and R. Beck (With 1 Figure) . .		52
Magnetic Fields in M33 and NGC 6946 By U.R. Buczilowski (With 1 Figure) . . . . .		54
The Magnetic Field Structure in M81 By M. Krause, R. Beck, and E. Hummel (With 1 Figure) . . . . .		57
The Magnetic Field in the Anomalous Arms in NGC 4258 By E. Hummel, M. Krause, and R. Beck (With 1 Figure) . . . . .		61
Spiral Arms as Ejection Phenomena By H. Arp (With 4 Figures) . . . . .		65

Optical Polarisation Studies of Galaxies. By S.M. Scarrott, D.W. Ward-Thompson, and R.F. Warren-Smith (With 3 Figures) . .	71
Nonthermal Radio Emission from Dwarf Galaxies: Do They Host Large-Scale Magnetic Fields? By U. Klein and R. Gräve (With 2 Figures) . . . . .	76
Scale Properties of the Turbulent Magnetic Field in the Large Magellanic Cloud. By J. Spicker and J.V. Feitzinger (With 2 Figures) . . . . .	82
Magnetic Fields and Faraday-Active Clouds out to the Distances of Quasars. By P.P. Kronberg (With 6 Figures) . . . . .	86

---

<b>Part II</b>	<b>Large-Scale Magnetic Fields in Our Galaxy</b>
----------------	--

---

Magnetic Fields in the Galaxy. By R. Wielebinski . . . . .	96
Interstellar Polarization and Magnetic Fields By P. Cugnon (With 1 Figure) . . . . .	100
The Local Magnetic Field as Determined by Pulsar Rotation Measures. By W. Sieber (With 3 Figures) . . . . .	110
Extended Polarized Emission at 2695 MHz in the Galactic Plane By N. Junkes, E. Fürst, and W. Reich (With 2 Figures) . . . . .	115
The Radio Continuum Brightness Minimum near Polaris: A Hole in the Interstellar Magnetic Field? By K. Reif (With 4 Figures) . . . . .	119
Vertical Expansion of the Galactic Gas Disk Behind the Spiral Shock Waves. By M. Tosa (With 2 Figures) . . . . .	123
Magnetic Field Effects in Galactic Disks By M.L. Sánchez-Saavedra and E. Battaner (With 2 Figures) . . . . .	128
Magnetic Field Structure of the Galaxy and the Formation of Galactic Winds By D. Breitschwerdt, J.F. McKenzie, and H.J. Völk (With 5 Figures) . . . . .	131
Galaxy Magnetic Fields and Hidden Matter in Galaxies By A.H. Nelson (With 2 Figures) . . . . .	142
Observations of Linear Polarization in the Galactic Centre Region By W. Reich, Y. Sofue, M. Inoue, and J.H. Seiradakis (With 3 Figures) . . . . .	146
The Magnetic Field in the Galactic Center Region By Y. Sofue and W. Reich (With 2 Figures) . . . . .	150

---

<b>Part III</b>	<b>Magnetic Fields in Star-Forming Regions and Supernova Remnants</b>
-----------------	---

---

The Strength of the Interstellar Magnetic Fields and Its Possible Role in HI Cloud Dynamics. By G.L. Verschuur (With 4 Figures) . . . . .	154
Optical Polarisation Studies of Star Formation Regions By S.M. Scarrott, T.M. Gledhill, and R.F. Warren-Smith (With 2 Figures) . . . . .	161
Observation of Magnetic Field Structure Around Newly Formed Stars By R.F. Warren-Smith, P.W. Draper, and S.M. Scarrott (With 2 Figures) . . . . .	166
Stochastic Star Formation, Magnetic Fields and the Fine Structure of Spiral Arms. By J.V. Feitzinger and J. Spicker (With 5 Figures) . . .	171
Magnetic Fields in Supernova Remnants - Results from Radio Continuum Observations. By E. Fürst (With 3 Figures) . . . . .	179
Magnetic Fields in Supernovae and Supernova Shells By W. Kundt (With 3 Figures) . . . . .	185

---

<b>Part IV</b>	<b>Magnetic Fields in Accretion Disks and Jets</b>
----------------	--

---

Magnetic Fields, Black Holes and Accretion Disks By E. Asseo (With 5 Figures) . . . . .	194
The Influence of External Magnetic Fields on the Structure of Thin Accretion Disks By U. Anzer, G. Börner, and E. Meyer-Hofmeister (With 2 Figures)	203
Stellar and Extragalactic Jets: An Introduction. By W. Hillebrandt	208
Magnetic Vortex Tubes and Charge Acceleration. By P.F. Browne	211
Collimation of Supersonic Gas Flows by Toroidal Magnetic Fields By D. Kössl (With 4 Figures) . . . . .	222
Jet Formation in Rapidly Rotating Magnetospheres By M. Camenzind (With 4 Figures) . . . . .	229

---

<b>Part V</b>	<b>Theoretical Aspects Related to Cosmical Magnetic Fields</b>
---------------	--

---

Evolving Magnetostatic Equilibria. By J.J. Aly . . . . .	240
Avoiding Magnetic Monopoles in Numerical MHD Calculations By M. Schmidt-Voigt (With 3 Figures) . . . . .	251
Stochastic Particle Acceleration at Magnetohydrodynamic Shock Waves. By W. Dröge (With 2 Figures) . . . . .	255

Synchrotron Radiation in a Plasma with Random Magnetic Fields By A. Crusius . . . . .	260
A Few Summarizing Remarks. By W. Hillebrandt (With 7 Figures)	264
Conference Summary. By R. Wielebinski . . . . .	269
<b>List of Participants</b> . . . . .	<b>271</b>
<b>Index of Contributors</b> . . . . .	<b>273</b>

