

TABLE OF CONTENTS

Preface	ix
Acknowledgements	xi

PART 1

SECTION I: THE MILKY WAY AS A GALAXY

M. JURA / The Milky Way as a Galaxy	3
-------------------------------------	---

SECTION II: OBSERVATIONS OF COMPONENTS OF THE INTERSTELLAR MEDIUM

N. Z. SCOVILLE and D. B. SANDERS / H ₂ in the Galaxy	21
P. F. GOLDSMITH / Molecular Clouds: An Overview	51
P. C. MYERS / Observations of Molecular Cloud Structure and Internal Motions	71
S. R. KULKARNI and C. HEILES / The Atomic Component	87
B. D. SAVAGE / Hot Interstellar Gas in the Galactic Disk and Halo	123
H. BLOEMEN / The High-Energy Component of the ISM—Cosmic-Ray Phenomena	143

SECTION III: INTERSTELLAR MAGNETIC PROPERTIES

C. HEILES / Interstellar Magnetic Fields	171
E. G. ZWEIBEL / The Theory of the Galactic Magnetic Field	195

SECTION IV: INTERSTELLAR PROCESSES ON A GALACTIC SCALE	
J. M. SHULL / Panel Discussion: Phases of the Interstellar Medium	225
L. L. COWIE / Mass and Energy Balance in the Interstellar Medium: How to Model the Disk Gas in our Galaxy	245
B. G. ELMEGREEN / Cloud Formation and Destruction	259
 SECTION V: DYNAMICAL PROCESSES IN INTERSTELLAR CLOUDS	
J. M. SHULL and B. T. DRAINE / The Physics of Interstellar Shock Waves	283
A. P. BOSS / Theory of Collapse and Protostar Formation	321
J. M. SCALO / Theoretical Approaches to Interstellar Turbulence	349
 PART 2	
 SECTION I: INTERSTELLAR DUST GRAINS	
A. G. G. M. TIELENS and L. J. ALLAMANDOLA / Composition, Structure, and Chemistry of Interstellar Dust	397
L. J. ALLAMANDOLA, A. G. G. M. TIELENS and J. R. BARKER / Infrared Absorption and Emission Characteristics of Interstellar PAHs	471
C. G. SEAB / Grain Destruction, Formation, and Evolution	491
D. E. BROWNLEE / Interstellar Grains in the Solar System	513
 SECTION II: INTERSTELLAR CHEMICAL PROCESSES	
E. B. JENKINS / Element Abundances in the Interstellar Atomic Material	533
W. M. IRVINE, P. F. GOLDSMITH and Å. HJALMARSON / Chemical Abundances in Molecular Clouds	561
E. HERBST / Gas Phase Chemical Processes in Molecular Clouds	611

S. S. PRASAD, S. P. TARAFDAR, K. R. VILLERE, and W. T. HUNTRESS, Jr. / Chemical Evolution of Molecular Clouds	631
S. TORRES-PEIMBERT and M. PEIMBERT / Chemical Evolution of Galaxies	667
B. L. LUTZ / The Solar System/Interstellar Medium Connection: Gas Phase Abundances	679
SECTION III: HEATING, COOLING AND RADIATIVE PROCESSES	
T. G. PHILLIPS / Observations of the Cooling of the Interstellar Gas	707
J. H. BLACK / Heating and Cooling of the Interstellar Gas	731
D. R. FLOWER / Atomic and Molecular Physics of Interstellar Heating and Cooling	745
M. ELITZUR / Masers in the Interstellar Medium	763
Subject Index	781