THE ANDROMEDA GALAXY

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THE ANDROMEDA GALAXY

by

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PREFACE

This book began about 10 years ago as a review paper. At that time the idea of a single article on M31 was not unthinkable. Soon, however, the situation changed. Perhaps it was just the general growth of astronomy, or perhaps the change was caused more directly by the increased numbers of large, well-equipped telescopes. Whatever the cause, it soon became the case that the amount of new material on the Andromeda Galaxy was growing faster than I was writing. It was gaining on me. Soon it overtook me and I realized that a single review paper would be far too limiting.

Fortunately, the good people at what was then Reidel (now Kluwer), especially N. M. Pols-v.d. Heijden were not averse to the idea of a monograph on M31. These same good people, especially Gerrit Kiers, have shown a remarkable amount of patience over the years in which I have tried to catch up with the advancing tide of material on M31. Although there was no sign that the tide might be changing, I decided at the end of 1991 that I would stop running with it. The result is on the following pages.

I have tried to include information on all major aspects of M31 research and citations to all major published papers through 1991. Experience tells me that I have not succeeded; surely some seminal papers, ones that I no doubt read and admired when they were published, became lost in the clutter of my desk and mind. I apologize to the authors of these papers and to the readers who will have to find them for themselves.

M31 represents a very special topic for study. It has many attractions (its proximity, its spiral arms, its kinematics) and provides certain difficulties (it is nearly edge-on); both have challenged our instruments and our ingenuity and, no doubt, will continue to for many years to come.

Table i, adapted from Hodge (1981) and van den Bergh (1991), summarizes some basic data on the Andromeda Galaxy, taken from the recent literature. Sources for the data and arguments for and against these choices will be found in the various chapters of the book.

TABLE i. Basic Properties of M31

Position (1950)	
Right Ascension	$00^h40^m00^s.3$
Declination	$+41°00'03''$
Angular diameter (optical)	$240'$
Apparent magnitude (V)	3.58
Color (B-V) and (U-B)	+0.91, +0.50
Distance modulus, apparent	24.5
Foreground reddening, E(B-V)	0.08
Distance modulus, true	24.3
Distance, kpc	725
Absolute magnitude, M_V	−21.0
Diameter, kpc	51
Angle of plane to line of sight	12°.5
Position angle of major axis	37°.7
Radial velocity (wrt sun), km/sec	−310
Mass (total, solar masses)	$> 4.1 \times 10^{11}$
Mass (neutral hydrogen, solar masses)	3.9×10^9

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Many people helped with this volume. Scores of astronomers and observatories generously let me use published diagrams and images and I list these on the next page. Many astronomers sent me preprints and reprints. Three specialists in the study of M31 – Sidney van den Bergh, Elias Brinks and René Walterbos – read much of the manuscript in an attempt to uncover its many mistakes and shortcomings.

Local help was both generous and competent. Sandi Larsen typed many of the first versions of the manuscript and Karen Fisher produced the final version of the text, utilizing her mastery of the latest techniques in word processing. Jeffrey Goldader, Loren Kelley, Debbie Yun and Grace Lee spent several weeks chasing down figures and references; their help was vital.

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