These minor flaws notwithstanding, the editors of *Mars* have put together a well-balanced and thoughtful collection that acknowledges the existence of many unresolved questions concerning the formation and evolution of the planet. The reference list alone is an astonishing accomplishment and a valuable resource in its own right. A few chapters, for example, those on gravity and topography, present the current state of knowledge well but will soon become obsolete. With the U.S. Mars Observer and MESUR and the Russian Mars 94 and 96 missions we are poised for a new decade of discovery. Equipped with this important source book of current knowledge, I am looking forward to continuing evolution—and revolution—in our understanding of Mars.

John F. Mustard
Department of Geological Sciences,
Brown University,
Providence, RI 02912

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Messier 31

The Andromeda Galaxy. PAUL HODGE. Kluwer, Norwell, MA, 1992. x, 358 pp., illus. $79. Astrophysics and Space Science Library, vol. 176.

Many fields of knowledge, biology for example, have been opened by surveys and morphological classification. In others, ancient Egyptian hieroglyphics for example, the detailed study of a single object provides the basis for a major fraction of future work. The Rosetta Stone of extragalactic astronomy is the Andromeda Galaxy. Andromeda, a.k.a. Messier 31 and NGC 224, is the most luminous of the three galaxies (other than our own Milky Way) visible to the naked eye, and the only one visible from the Northern Hemisphere. Andromeda is also nearly a duplicate of our own galaxy. Whereas our own galaxy is difficult to study as a whole because the solar system is deeply embedded in its gas and dust, Andromeda is arrayed before us in the full glory of a giant spiral. If the Milky Way is the *Queen Mary* of galaxies, Andromeda is the *QE II*.

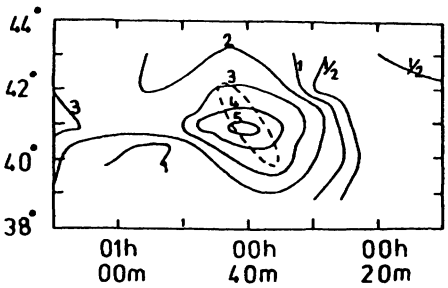
In *The Andromeda Galaxy* Paul Hodge presents a summary of almost all the work done on Andromeda since the beginning of written history. The first recorded mention of the nebula was made in the 10th century by al-Sufi. Although the nebula was observed and mentioned by numerous astronomers in the intervening years, serious work on it didn't begin until near the end of the 19th century. This attention was due to two events, the development of photography to record images through telescopes and the eruption of S Andromeda or SN1885a, the first extragalactic supernova observed by humankind. S Andromeda fueled both sides of the debate on the galactic or extragalactic nature of the nebulae. This debate finally was decided conclusively by Hubble's discovery of extragalactic Cepheids, also in the Andromeda galaxy, in the early 1920s.

Hodge collects and reviews work on Andromeda's dynamics, gas and dust content, stellar populations, and radio and x-ray observations. He is at his best describing the work on stellar populations in Andromeda, to which he has made many fundamental contributions. Particularly useful is the review of his own "population box" description of a galaxy's stellar content, which is the first quantitative conceptual attempt to view the stellar content of a galaxy as more than a one-parameter family.

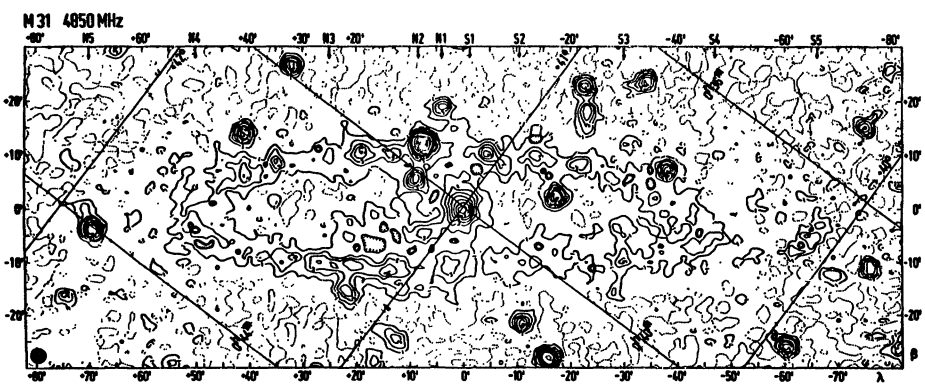
This book is an excellent reference for the serious student of galaxies. Every classic paper on Andromeda is cited, and all the important results are well described and summarized. Hodge takes particular pains to compare and contrast Andromeda with the Milky Way. However, in covering all the observational bases, he spends little time on the deeper astrophysical implications of the observations—the importance of Andromeda and its stellar constituents as one of the first rungs of the extragalactic distance ladder, the importance of the measurement of its neutral hydrogen rotation curve and halo of globular clusters in the dark-matter–missing-mass debate. If the reader is interested in a description of the detailed physical processes that describe a galaxy, especially its internal kinematics and dynamics, a better book would be *The Milky Way as a Galaxy*, edited by Buser and King (University Science Books), which is, in many ways, complementary to *The Andromeda Galaxy*.

This is not a book for the general reader. The presentation is very dry and only a little of the author's own spirit and incisive interpretation is in it. There are several minor references given in the text but missing from the reference list. On the other hand, I'm sure glad I now have the book on *my* reference shelf.

John Huchra
Harvard-Smithsonian Center for Astrophysics,
Cambridge, MA 02138



"The first radio continuum map of M31," made by R. Hanbury Brown and C. Hazard in 1950. M31 "was the first object that Hanbury Brown and Hazard turned to after getting the Jodrell Bank 218-foot transit telescope in final form for observing. . . . It took them 90 nights, working during the radio-quiet time around midnight, to map out the radio radiation" shown here. [Reproduced in *The Andromeda Galaxy* from W. Sullivan, Ed., *The Early Years of Radio Astronomy* (Cambridge University Press, 1984)]



"Contour map of M31 at 4850 MHz, clearly showing the 10 kpc ring structure. Arrows indicate positions of Baade's arms N5 to S5." [From *The Andromeda Galaxy*, E. Berkhuijsen *et al.*, *Astron. Astrophys.* **117**, 141 (1983)]

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Southerly Enterprises

A History of Antarctic Science. G. E. FOGG. Cambridge University Press, New York, 1992. xxii, 483 pp., illus. $89.95. Studies in Polar Research.

The canvas is vast—a continent of 13 million square kilometers averaging 1500 meters above sea level and covered over much of its area by more than a kilometer of ice and snow. Below its frozen surface the land is depressed hundreds of meters; where