

Table of Contents

Foreword	vii
Authors' Introduction	xi
Acknowledgments	xv
How Annals of the Deep Sky is Organized	1
An Introduction to Basic Astronomy	7
The Celestial Sphere.....	8
Directions in the Sky.....	13
Right Ascension and Declination.....	14
Angular Measurement.....	16
Precession	19
The Stellar Visual Magnitude System.....	21
Absolute Magnitude	25
Distances	25
Descriptive Astrophysics	31
Astrophysical Milestones	31
Stars	37
The H-R Diagram: The Track of a Star's Life.....	43
Variable Stars.....	45
A Word about Light Curves	49
Types of Variable Stars	50
Eruptive.....	50
Pulsating.....	52
Rotating.....	56
Cataclysmic	57
Close Eclipsing Binary Systems.....	62
Double Star Systems	63
Some Double-Star Particulars	65
Deep-Sky Objects: Classification Schemes and Astrophysical Essentials	73
Open Clusters	74
Open Cluster Essentials	75
Globular Clusters	78
Globular Cluster Essentials.....	79
Nebulae: The Stuff of Stars	84

Bright Nebulae	85
Reflection Nebulae	85
Planetary Nebulae	88
Dark Nebulae	91
Supernova Remnants	94
Galaxy Classification	96
The Hubble-Sandage Sequence	96
The de Vaucouleurs Revision	106
Peculiar Galaxies	113
Peculiar Galaxies: The Modern View	117
Andromeda.	123
Notable Stars in Andromeda	131
Alpheratz, Alpha (α) Andromedae	131
Almach, Gamma (γ) Andromedae	136
Delta (δ) Andromedae	139
Upsilon (υ) Andromedae	140
Groombridge 34	141
Stephen Groombridge and His Star Catalog	145
36 Andromedae	146
R Andromedae	148
Z Andromedae	153
Williamina Fleming	154
Galactic Objects in Andromeda	160
NGC 752	160
NGC 7662	162
Extragalactic Objects in Andromeda	167
M31, the Andromeda Galaxy	167
M31's Stellar Content, Disk Structure, and Nucleus	176
M31's Satellite Galaxies	186
M32	187
NGC 147 and NGC 185	189
NGC 205 (M110)	193
M31's Plane of Orbiting Galaxies	194
Mayall II	195
NGC 404	199
NGC 891	201
Abell 262, A Cavity Cluster of Galaxies	204
The Third Dimension: Looking Toward Andromeda through the Milky Way	208
Looking Through Andromeda: The Extragalactic View	210

Antlia	215
Notable Stars in Antlia.....	219
Zeta (ζ)1 Antliae.....	219
S Antliae.....	220
Extragalactic Objects in Antlia.....	221
NGC 2997.....	221
NGC 3223.....	223
Antlia Galaxy Cluster.....	228
Apus	233
Notable Stars in Apus.....	238
Alpha (α) Apodis.....	238
Beta (β) Apodis.....	239
Gamma (γ) Apodis.....	241
Delta (δ) Apodis.....	241
Theta (θ) Apodis.....	244
Kappa (κ) 1 and 2 Apodis.....	245
S Apodis.....	245
Galactic Objects in Apus.....	248
NGC 6101.....	248
James Dunlop: Forgotten Pioneer of Southern Astronomy.....	250
IC 4499.....	253
Extragalactic Objects in Apus.....	256
IC 4633 and IC 4635.....	256
Aquarius	259
Notable Stars in Aquarius.....	266
Sadalmelik, Alpha (α) Aquarii.....	266
Sadalsuud, Beta (β) Aquarii.....	268
Zeta (ζ) Aquarii.....	269
Subcompanions to Zeta Aquarii?.....	271
R Aquarii.....	274
Galactic Objects in Aquarius.....	280
NGC 7293.....	280
M73.....	287
NGC 7009.....	291
M2.....	297
M72.....	301
Extragalactic Objects in Aquarius.....	304
NGC 7392.....	304

NGC 7252	306
Aquarius' Abell Galaxy Clusters and the Large-Scale Structure .	309
Source Material	315
The Problematic Nature of Star Names	318
Some Astronomy Symbols, Abbreviations, and Values	319
The Nature of Planetary Nebulae — A Brief History	323
Figure Acknowledgements — Volume 1	331
Index	335