

Touring the Universe through Binoculars

A Complete Astronomer's Guidebook



PHILIP S. HARRINGTON

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Three generations of love and encouragement

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Preface

Star-gazing was never more popular than it is now. In every civilized country many excellent telescopes are owned and used, often to very good purpose, by persons who are not practical astronomers, but who wish to see for themselves the marvels of the sky. . . . And with the aid of an opera-glass most interesting, gratifying and, in some instances, scientifically valuable observations may be made of the heavens.

So wrote Garrett P. Serviss in the opening of his classic 1888 work, *Astronomy with an Opera-Glass*, the first book written about observing the universe through binoculars. It is fascinating how, a century after its publication, we may repeat his message with equal validity. With the recent launch of the Hubble Space Telescope, the promise of a rekindled U.S. space program, and an increased awareness of celestial events, public interest in astronomy has never been greater. Many people now realize that there is a lot going on over their heads.

Astronomy may be the oldest science, but it is anything but static. Today, our picture of the universe is so radically different from those earlier times, that Mr. Serviss and his contemporaries could not even begin to imagine it. A century ago, astronomers spoke of canals on Mars and the possibility of a "Planet X" beyond Neptune and another within the orbit of Mercury. They were perplexed by the strange spiral-shaped clouds that were seen across the sky. Many were found, but their origin and significance were not understood.

These riddles have been solved over the past hundred years. The Martian canals and the mysterious innermost planet are both dismissed as misinterpreted observations. The enigma of Planet X was answered in 1930 with the discovery of Pluto. Finally, with

the application of photography to astronomy, those odd pinwheel nebulae were resolved into distant galaxies. Each was found to be a complete star system in itself, much like the Milky Way galaxy.

Today, other questions have replaced those of our forebears. We yearn to find out more about pulsars, quasars, and black holes. Did the universe originate from a colossal explosion 18 billion years ago? Will it continue to expand forever, or will it stop and reverse direction?

Like children, we have just started to take our first unsteady steps off of our own world and out into the Solar System. As space probes answer our questions about our celestial neighborhood, they raise others we never even thought to ask. Some will have to wait for future missions to answer them; the remainder will have to wait for future generations. There is still so much to learn.

Large telescopes and space probes are not needed to discover the heavens. Even the simplest binoculars will begin to reveal sights that were unsuspected or unrecognized in the days of Garrett Serviss.

Touring the Universe through Binoculars is intended to be the most thorough examination of the binocular sky ever compiled. Throughout its pages, you will find a wealth of objects and projects for amateurs who, like me, have made a conscious choice to use binoculars. To tell you the truth, I really wrote this book for myself! There is an abundance (dare I say, overabundance) of books on the market today that sing the praises of large-aperture, sophisticated instruments. Most of these books are quite good, but their intent is not for binocular observers.

Beginning with the Moon, we tour the Solar System and then escape the realm of our Sun to visit the stars. Over 1,100 deep sky objects visible through binoculars are listed. Of these, the appearance of more than 400 have been described in detail. Now, I am not saying that all are seen better through binoculars than through a telescope; that simply is not the case. Still, many are best viewed using low power and a wide field of view, and some cannot even be seen at all through the restrictive eyes of telescopes.

I welcome your comments, especially if you should find any errors (Gadzooks)! Just write to me in care of the publisher, John Wiley & Sons, Inc. I shall endeavor to answer all letters, but in case I miss yours, thank you in advance!

Gaze skyward on the next clear evening. The universe awaits.

Acknowledgments

While the book that you hold before you is the product of one pen, I wish to take a moment to thank the many individuals who have contributed to its ultimate success. Throughout the book, you will find what I judge to be some magnificent astrophotographs. These marvelous pictures were taken by Jim Barclay, Lee Coombs, Dennis diCicco, James Fakatselis, Martin Germano, Johnny Horne, Jeffrey Jones, Brian Kennedy, Jack Newton, George Viscome, Bernard Volz, and Kim Zussman. Take it from me, they are among the best amateur astrophotographers around today, and I thank them for their input.

I also wish to thank Jerry Burns, John Riggs, Pearson Menoher, Norman Butler, and Lee Cain. They constructed the unique binoculars and binocular mounting systems which you will find detailed in Appendix B.

I wish to extend my sincere appreciation to my proofreaders Richard Sanderson, Jack Megas, and Edward Pascuzzi, who read the manuscript over and over again and so eloquently passed on suggestions while dealing with my fragile ego. Aiding me in many different ways "behind the scenes" were Eric Hilton, John Kamon, David Eicher, Frederick Bump, and Louis Renzulli. Many thanks also to David Sobel and Frank Grazioli of John Wiley & Sons, and to Laura Cleveland of WordCrafters, for their patient guidance and help to this virgin book author.

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Contents

1	Why Binoculars?	1
2	The Moon	3
3	The Planets	25
4	Minor Members of the Solar System	37
5	The Sun	47
6	Stellar Happenings	55
7	A Survey of the Night Sky	81

Appendices

A	Caveat Emptor! (Let the Buyer Beware!)	263
B	Mounting Concerns	269
C	Care, Maintenance, and Other Tidbits	276
D	Binocular Manufacturers	279
E	Converting Universal Time to Local Time	281
F	For Further Information . . .	283
G	Bibliography	285

Index	287
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