

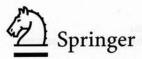


The New Amateur Astronomer



Martin Mobberley

With 124 Figures



<u>Cover illustration:</u> Background: The Theophilus region of the Moon imaged by Mike Brown of York, England (see Chapter 6).

British Library Cataloguing in Publication Data
Mobberley, Martin, 1958–
The new amateur astronomer.–(Patrick Moore's practical
astronomy series)
1. Astronomy–Amateurs' manuals 2. Astronomical instruments
–Amateurs' manuals 3. Astronomers
I. Title
520
ISBN 1852336633

Library of Congress Cataloging-in-Publication Data Mobberley, Martin, 1958–

The new amateur astronomer / Martin Mobberley.
p. cm. – (Patrick Moore's practical astronomy series, ISSN 1617-7185)
Includes bibliographical references and index.
ISBN 1-85233-663-3 (pbk.: alk. paper)

1. Astronomy-Amateur's manuals. I. Title. II. Series.

QB63.M595 2004

520-dc22

2004041728

Apart from any fair dealing for the purposes of research or private study, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the publishers, or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency. Enquiries concerning reproduction outside those terms should be sent to the publishers.

Patrick Moore's Practical Astronomy Series ISSN 1617-7185 ISBN 1-85233-663-3 Springer-Verlag London Berlin Heidelberg Springer-Verlag is part of Springer Science+Business Media springeronline.com

© Springer-Verlag London Limited 2004 Printed in the United States of America

The use of registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant laws and regulations and therefore free for general use.

The publisher makes no representation, express or implied, with regard to the accuracy of the information contained in this book and cannot accept any legal responsibility or liability for any errors or omissions that may be made. Observing the Sun, along with a few other aspects of astronomy, can be dangerous. Neither the publisher nor the author accepts any legal responsibility or liability for personal loss or injury caused, or alleged to have been caused, by any information or recommendation contained in this book.

Typeset by EXPO Holdings, Malaysia 58/3830-543210 Printed on acid-free paper SPIN 10880729

Preface

It was a book that initially inspired me to observe the night sky: Patrick Moore's *Observer's Book of Astronomy* (1968 edition). The things that really caught my eye in that book were the superb planetary paintings by the late Leslie Ball and pictures of 1960s amateur telescopes: Henry Brinton's $12\frac{1}{2}$ -inch reflector, Patrick's $12\frac{1}{2}$ -inch reflector and run-off shed, and J. Hedley Robinson's observatory at Teignmouth.

I was ten at the time, but I knew that one day I wanted to get planetary images like those sketched by Leslie Ball, wanted to own a good telescope, and wanted to write a few books like Patrick. Thirty-five years on, my ambitions have not changed at all, but technology has moved on. Amateurs are now achieving what professionals achieved in 1968, both in terms of limiting magnitude, resolution, and discoveries! The "new" amateur astronomer still strives for the best telescope in his or her backyard, but can now observe in the warm, using CCDs and robotic telescopes. My feelings about that first astronomy book have stayed with me, and I firmly believe that amateurs are still principally inspired by spectacular planetary, cometary, and deep-sky images. I also believe that pictures of observers and their equipment are essential in any book about observing the night sky. There are plenty such images here.

The biggest challenge for any writer in this field is to decide at what level to pitch the book. The other problem is what to leave out; publishing, like everything else, is governed by economic constraints. I hope I've got the balance right because, above all, this book is intended to inspire determined beginners and experienced observers alike. I have split the book into two parts, dealing with the basics and equipment first and then moving on to the observers and their techniques.

Complete beginners will want to read Chapters 1 to 3, but the experienced observer has my permission to start at Chapter 4!

Above all, I want this book to encourage and lead the potential new amateur astronomer on a voyage of discovery, ultimately emulating the remarkable people discussed in Part II.

Good luck on your voyage.

Martin Mobberley Suffolk, United Kingdom July 2004



Acknowledgments

I am indebted to many fellow astronomers who have freely donated images to this book. It is a policy I have always adopted myself; if anyone wants to use my images, they can have them – just drop me a line; I'm flattered that others want my images! To be honest, most amateur astronomy books would not be commercially viable if not for the generosity of amateurs in this way. But, even though I knew how generous my fellow astronomers were, I was staggered by the speed and enthusiasm with which they flooded me with their pictures!

I am indebted to the following astronomers:

Ron Arbour; Mark Armstrong; Tom Boles; Mike Brown; Denis Buczynski; Ron Dantowitz; Brad Ehrhorn; Andrew Elliott; Ray Emery; Nigel Evans; Steve Evans; Sheldon Faworski; Maurice Gavin; Ed Grafton; Karen Holland; Guy Hurst; Nick James; Chris Kitchin; Brian Knight; Weidong Li; Jan Manek; Pepe Manteca; Hazel McGee; Michael Oates; Arto Oksanen; Donald Parker; Damian Peach; Terry Platt; Gary Poyner; Tim Puckett; Gordon Rogers; Michael Schwartz; Greg Terrance; Roy Tucker; and James Young.

Many thanks also to the following companies and organizations:

Starlight Xpress; Meade Instruments Corporation; Celestron International; RC Optical Systems; Astrophysics; Scopetronix; IOTA-ES; SBIG; JPL/NASA; ESA; Apogee; Finger Lakes Instruments; and Lick Observatory.

I must also thank my parents for their support: in particular, my father's help in all my astronomical endeavors.

Finally, my thanks must also go to John Watson (London) and Louise Farkas (New York) and their respective teams at Springer, without whom this book would not exist at all!

Martin Mobberley Suffolk, United Kingdom July 2004



Contents

Inti	oduction – Why Amateur Astronomy?
Po	art I – The Equipment
1	Optical Fundamentals5
2	Buying a Commercial Telescope
3	Navigating the Rotating Spherical Sky
4	"Go To" Telescopes and Mountings
5	Digicams and Video Astronomy55
6	Cooled CCD Cameras
7	Image-Processing Software
Po	art II – The People
8	CCD Planetary Imagers
9	Supernova Discoverers
10	Deep-Sky Perfectionists
11	Cataclysmic-Variable Observers and Gamma Ray Burster Hunters 185
12	Saving the World: Near-Earth Object Chasers
13	Armchair Comet Hunters
14	Backyard Spectroscopists
App	pendix: Useful Web Page URLs and Equipment Suppliers221
Ind	ex