

## How To Polar Align Your Nexstar 8i Telescope

Total Solar Eclipses and How to Observe Them Springer Science & Business Media

Amateur astronomers who want to enhance their capabilities to contribute to science need look no farther than this guide to using remote observatories. The contributors cover how to build your own remote observatory as well as the existing infrastructure of commercial networks of remote observatories that are available to the amateur. They provide specific advice on which programs to use based on your project objectives and offer practical project suggestions. Remotely controlled observatories have many advantages—the most obvious that the observer does not have to be physically present to carry out observations. Such an observatory can also be used more fully because its time can be scheduled and usefully shared among several astronomers working on different observing projects. More and more professional-level observatories are open to use by amateurs in this way via the Internet, and more advanced amateur astronomers can even build their own remote observatories for sharing among members of a society or interest group. Endorsements: “Remote Observatories for Amateur Astronomers Using High-Powered Telescopes from Home, by Jerry Hubbell, Rich Williams, and Linda Billard, is a unique contribution centering on computer-controlled private observatories owned by amateur astronomers and commercialized professional–amateur observatories where observing time to collect data can be purchased. Before this book, trying to piece together all of the necessary elements and processes that make up a remotely operated observatory was daunting. The authors and contributors have provided, in this single publication, a wealth of information gained from years of experience that will save you considerable money and countless hours in trying to develop such an observatory. If you follow the methods and processes laid out in this book and choose to build your own remotely operated observatory or decide to become a regular user of one of the commercial networks, you will not only join an elite group of advanced astronomers who make regular submissions to science, but you will become a member of an ancient fraternity. Your high-technology observatory will contain a “high-powered telescope” no matter how large it is, and from the comfort of home, you can actively contribute to the work that started in pre-history to help uncover the secrets of the cosmos.” Scott Roberts Founder and President, Explore Scientific, LLC. “In the past three and a half decades, since I first became involved with remote observatories, the use of remote, unmanned telescopes at fully automated observatories has advanced from a very rare approach for making astronomical observations to an increasingly dominant mode for observation among both professional and amateur astronomers. I am very pleased to see this timely book being published on the topic. I highly recommend this book to readers because it not only covers the knowledge needed to become an informed user of existing remote observatories, but also describes what you need to know to develop your own remote observatory. It draws on more than two decades of remote observatory operation and networking by coauthor Rich Williams as he developed the Sierra Stars Observatory Network (SSON) into the world-class network it is today. This book is the ideal follow-on to coauthor Jerry Hubbell’s book Scientific Astrophotography (Springer 2012). Remote observatories have a bright future, opening up astronomy to a new and much larger generation of professional, amateur, and student observers. Machines and humans can and do work well together. I hope you enjoy reading this book as much as I have and will take advantage of the developments over the past several decades by the many pioneers of remote observatories.” Russ Genet, PhD. California Polytechnic State University Observing Saturn for the first time is a memory that stays with us for the rest of our lives, and for many it is the start of an odyssey—an odyssey into observational astronomy. Remote Observatories for Amateur Astronomers is a book written for observers, beginners, and old hands alike, providing detailed advice to those wishing to improve their observing skills. Many will want to build and operate a remotely controlled observatory, and for those, Part I of this book is an invaluable source of information. If, like me, you choose to avoid the capital outlay of owning your own facility, Part II describes how you can use one of the many professionally run large scopes where, for a few dollars, you can capture spectacular color images of nebulae, galaxies, and comets. My own scientific interest in short period eclipsing binaries has been made possible through the availability of remote telescopes such as those operated by the Sierra Stars Observatory Network (SSON). Whichever route you take, this book is essential reading for all who aspire to serious observing. David Pulley The Local Group (UK) You too can follow in the steps of the great astronomers such as Hipparchus, Galileo, Kepler and Hubble, who all contributed so much to our modern understanding of the cosmos. This book gives the student or amateur astronomer the following tools to replicate some of these seminal observations from their own homes: With your own eyes: Use your own observations and measurements to discover and confirm the phenomena of the seasons, the analemma and the equation of time, the logic behind celestial coordinates, and even the precession of the equinoxes. With a consumer-grade digital camera: Record the changing brightness of an eclipsing binary star and show that a pulsating star changes color as it brightens and dims. Add an inexpensive diffraction grating to your camera and see the variety of spectral features in the stars, and demonstrate that the Sun’s spectrum is similar to one particular type of stellar spectrum. With a backyard telescope: Add a CCD imager and you can measure the scale of the Solar System and the distance to a nearby star. You could even measure the distance to another galaxy and observe the cosmological redshift of the expanding universe. Astronomical Discoveries You Can Make, Too! doesn’t just tell you about the development of astronomy; it shows you how to discover for yourself the essential features of the universe.

Digital SLR cameras have made it easier than ever before to photograph the night sky. Whether you're a beginner, nature photographer, or serious astronomer, this is the definitive handbook to capturing the heavens. Starting with simple projects for beginners such as cameras on tripods, it then moves onto more advanced projects including telescope photography and methods of astronomical research. With 80% revised and updated material, this new edition covers nightscapes, eclipses, using cameras with sky trackers and telescopes, and tools for identifying celestial objects and investigating them scientifically. Image processing is discussed in detail, with worked examples from three popular

software packages - Nebulosity, MaxIm DL, and PixInsight. Rather than taking a recipe-book approach, Covington explains how your equipment works as well as offering advice on many practical considerations, such as choice of set-up and the testing of lenses, making this a comprehensive guide for anyone involved in astrophotography.

Provide the reader with everything he needs to know about what to observe, and using some of today's state-of-the-art technique and commercial equipment, how to get superb views of faint and distant astronomical objects. Only guide to live observation of deep space, utilizing modern image enhancement techniques (image intensifiers and CCD video monitors) Detailed information supplied on the image intensifiers and CCD video monitors Explains how to select and prepare sites for live viewing.

This book covers the "why," "how," and "what" of astronomy under light-polluted skies. The prospective city-based observer is told why to observe from home (there are hundreds of spectacular objects to be seen from the average urban site), how to observe the city sky (telescopes, accessories, and moderns techniques), and what to observe. About half of the book is devoted to describing "tours" of the sky, with physical and observational descriptions, at-the-eyepiece drawings, and photographs.

This guide is specifically aimed at those who are using—or want to use—Sequence Generator Pro. SGP is a “session management” software package that controls the telescope, mount, camera, and ancillary equipment to target and secure images during a night of imaging astronomical objects. The book begins with a special tutorial to get up and running with SGP. With a comprehensive reference section, it takes the user in detail through the various aspects of user and equipment profiles, equipment definitions, the sequencer, and other essential elements of SGP. Finally, it focuses on how to get the most out of the ancillary programs—target databases, autoguiders, plate solvers, planetarium software, and other applications. Oftentimes, technical guides can end up being far denser than the processes they intend to explain. Many of the insights provided by SGP expert Alex McConahay are beyond what can be found in the official program documentation. In this book, the reader will find in-depth, yet straightforward practical advice on how to automate nightly astroimaging sessions with Sequence Generator Pro.

The investment in our love of space and skygazing can be high. All too often, we are led to believe that we did not have enough equipment, or have the wrong equipment or we are not doing things right. Telescope Rx is intended to provide solid and practical advice on everything from setting up a telescope, eyepieces, important accessories and even computer or smart phone programs to run the telescope, then turning that telescope into a nightly research tool with projects for every night you wish to pursue. This is your directory to properly outfit your telescope without spending lots of money; what the functions of astronomical telescope are, pitfalls to avoid in purchasing, and ultimately your guide to pursue some serious scientific studies with your telescope after you have had your long look around. The sky is out there for all of us to study and enjoy. Through your proper understanding of how to set up a telescope and do those studies, you mind, spirit and enthusiasm will grow.

This book provides a thorough introduction to and exploration of deep sky astrophotography for the digital photographer. With over 280 images, graphs, and tables, this introductory book uses a progressive and practical style to teach readers how to image the night sky using existing, affordable equipment. The book opens with a brief astronomy primer, followed by chapters that build progressively to explain the challenges, offer solutions, and provide invaluable information on equipment choice through image capture, calibration, and processing in affordable software. The book's focus ranges from how to image sweeping vistas and star trails using only a camera body, lens and tripod, to more advanced methods suitable for imaging galaxies, clusters, nebulae, and stars. Other features of the book include: Real-world assignments showing how and when to use certain tools and how to overcome challenges and setbacks Practical construction projects Evaluations of the most recent developments in affordable hardware and software Exploration on how sensor performance and light pollution relate to image quality and exposure planning Ground-breaking practical chapters on lucky imaging and choosing and using the latest CMOS cameras Written in an accessible, easy to follow format, this comprehensive guide equips readers with all the necessary skills to progress from photographer to astrophotographer.

Light pollution has spread so much in the last few decades that it often compromises our view of the stars. It is becoming more and more difficult to find an observing site with clear, dark skies away from light and industrial pollution. However, with patience, some simple equipment, and by choosing the right targets to observe, amateur astronomers can still find observing from towns and cities a rewarding hobby. The result of thirty years of observing the night sky from within a city, Denis Berthier's practical guide will help amateur astronomers to enjoy their hobby without having to travel to distant sites, and without using complicated equipment or difficult techniques, enabling them to observe and photograph stars and planets as well as many other celestial objects.

Amateur astronomy is becoming increasingly popular, mostly because of the availability of relatively low-cost astronomical telescopes such as the Schmidt-Cassegrain and Maksutovs. The author describes what these instruments will do, how to use them, and which are the best - he draws on 25-years of experience with telescopes. There are sections on accessories, observing techniques, and hints and tips on: cleaning, collimating, maintaining the telescope, mounting, using the telescope in various conditions, computer control, and imaging (wet, digital and CCD). This is the perfect book for amateur astronomers who are about to invest in a new Schmidt-Cassegrain or Maksutov telescope, or for those who already have one and want to get the most out of it.

Catadioptric telescopes (CATs) such as the Schmidt Cassegrains remain popular among amateur astronomers for their ability to reveal thousands of beautiful deep-space wonders. Additionally, their computer-assisted capabilities allow them to automatically point to and track celestial objects, making astronomy accessible to more people than ever before. However, selecting the right one and learning how to use it can be difficult for stargazers both old and new. That's where this book comes in. The first edition, published in 2009, has remained the standard reference for mastering these popular instruments. This revised edition brings the material completely up to date, with several extensively rewritten chapters covering the most recent developments in telescope and camera equipment as well as computer software. Through the author's 45 years of experience with catadioptric telescopes, readers will learn to decide which catadioptric telescope is right for them, to choose a specific make and model, and finally, to use the telescope in the field. Covered in other chapters are: Solar System and deep-sky observations; astrophotography and computer control of CATs; and troubleshooting and maintaining your equipment. If you dream of owning a telescope or are frustrated by the telescope you already own, this is the book for you!

Scientific Astrophotography is intended for those amateur astronomers who are looking for new challenges, once they have mastered visual observing and the basic imaging of various astronomical objects. It will also be a useful reference for scientifically inclined observers who want to learn the fundamentals of astrophotography with a firm emphasis on the discipline of scientific imaging. This books is not about

making beautiful astronomical images; it is about recording astronomical images that are scientifically rigorous and from which accurate data can be extracted. This book is unique in that it gives readers the skills necessary for obtaining excellent images for scientific purposes in a concise and procedurally oriented manner. This not only gets the reader used to a disciplined approach to imaging to maximize quality, but also to maximize the success (and minimize the frustration!) inherent in the pursuit of astrophotography. The knowledge and skills imparted to the reader of this handbook also provide an excellent basis for "beautiful picture" astrophotography! There is a wealth of information in this book – a distillation of ideas and data presented by a diverse set of sources and based on the most recent techniques, equipment, and data available to the amateur astronomer. There are also numerous practical exercises. Scientific Astrophotography is perfect for any amateur astronomer who wants to go beyond just astrophotography and actually contribute to the science of astronomy.

This book offers a comprehensive introductory guide to "choosing and using" a series LXD55 or LXD75 computer-controlled ("goto") telescope, containing a wealth of useful information for both beginners and more advanced practical amateur astronomers. The manufacturer's manuals are not nearly detailed enough to be of real help to beginners. No other book offers advanced techniques for more experienced LXD series users.

A complete 2004 how-to guide, packed with advice on the most popular telescope in the world.

This is the ultimate, easy-to-read guide for "eclipse-chasers" which includes everything an eclipse chaser needs. There are some important eclipses coming up in the years ahead and the technology available to amateur astronomers is improving fast. The book provides "eclipse virgins" with a good feeling for what a trip abroad to an eclipse is like – including a humorous look at all the things that can and have gone wrong. Travel details are included, essential in these days of high-security. And of course the first part of the book contains a wealth of information about solar eclipses and what can be observed only during a total eclipse.

Arditti's approachable work covers the all the details of design, siting and construction – once a basic type has been decided upon. It is written in a way that is equally applicable to the USA and UK (where there are slightly different building regulations) and deals with matters that are basic to building and commissioning any amateur observatory. Uniquely, David Arditti also considers the aesthetics of amateur observatories – fitting them in with family and neighbors, and maybe disguising them as more common garden buildings if necessary. Every amateur astronomer who wants a purpose-built observatory (and let's face it, which one of them doesn't?) will find this book invaluable. The first handbook that describes how to start observing the sky with a computerized telescope.

Discover the wonders of the Universe with this complete introduction to observing and understanding the night sky. This practical guide explains and demystifies stargazing, teaching you to recognize different kinds of objects and showing you how they move through the sky over the course of the night and the year. It shows you how to understand and enjoy the cosmos, building your practical astronomy skills from the basics to more advanced techniques. Beginning with an explanation of the Universe itself - how big is it, what shape is it, how old is it, and will it end? - it then takes you on a tour around the night sky, building up your knowledge in simple stages. Practical advice begins with naked-eye observations, then illustrated step-by-step instructions show you how to set up and use binoculars and telescopes and how to take your own pictures of the night sky. It also lets you take a closer look at the different objects you can view in the night sky, telling you how to train your eye to recognize basic patterns of stars (constellations) and how to tell planets apart from other celestial bodies, showing you how to observe them in an innovative step-by-step way. An atlas of the night sky is also included, with charts that can be used in both the northern and southern hemispheres throughout the year. Accessible, inspirational, and authoritative, The Practical Astronomer will enthuse and inform anyone who wants to expand their knowledge of the night sky.

Demystifying Astronomy is an absolute beginner's guide to choosing binoculars, telescopes, eyepieces and accessories for visual astronomy. Based on the author's own journey and extensive research in the subject, it provides everything you need to know to get started in this fascinating and hugely popular hobby. Discusses the differences between telescope types, what you should consider when making your choice, and what you can expect to see. Also explains focal length, collimation, and much technical terminology, as well as eyepieces, accessories, troubleshooting and maintenance.

Here are clear explanations of how to make superb astronomical deep-sky images using only a DSLR or webcam and an astronomical telescope – no expensive dedicated CCD cameras needed! The book is written for amateur astronomers interested in budget astrophotography – the deep sky, not just the Moon and planets – and for those who want to improve their imaging skills using DSLR and webcams. It is even possible to use existing (non-specialist astronomical) equipment for scientific applications such as high resolution planetary and lunar photography, astrometry, photometry, and spectroscopy. The introduction of the CCD revolutionized astrophotography. The availability of this technology to the amateur astronomy community has allowed advanced science and imaging techniques to become available to almost anyone willing to take the time to learn a few, simple techniques. Specialized cooled-chip CCD imagers are capable of superb results in the right hands – but they are all very expensive. If budget is important, the reader is advised on using a standard camera instead. Jensen provides techniques useful in acquiring beautiful high-quality images and high level scientific data in one accessible and easy-to-read book. It introduces techniques that will allow the reader to use more economical DSLR cameras – that are of course also used for day-to-day photography – to produce images and data of high quality, without a large cash investment.

No longer are heavy, sturdy, expensive mounts and tripods required to photograph deep space. With today's advances in technology, all that is required is an entry-DSLR and an entry level GoTo telescope. Here is all of the information needed to start photographing the night sky without buying expensive tracking mounts. By using multiple short exposures and combining them with mostly 'freeware' computer programs, the effect of image rotation can be minimized to a point where it is undetectable in normal astrophotography, even for a deep-sky object such as a galaxy or nebula. All the processes, techniques, and equipment needed to use inexpensive, lightweight altazimuth and equatorial mounts and very short exposures photography to image deep space objects are explained, step-by-step, in full detail, supported by clear, easy to understand graphics and photographs. Currently available lightweight mounts and tripods are identified and examined from an economic versus capability perspective to help users determine what camera, telescope, and mount is the best fit for them. A similar analysis is presented for entry-level telescopes and mounts sold as bundled packages by the telescope manufacturers. This book lifts the veil of mystery from the creation of deep space photographs and makes astrophotography affordable and accessible to most amateur astronomers. Unlock the mysteries of the night sky with this comprehensive guide to astronomy. The Practical Astronomer explains and demystifies stargazing and teaches you how to observe and navigate the night sky. Learn how to set up your binoculars and telescopes and find out how to spot different celestial bodies, such as stars, planets, nebulae, and galaxies. Train your telescope into the sky and learn astrophotography with your smartphone camera or digital camera. Hop from one star to another to locate the different constellations or other deep space objects. The book contains sky maps charting all the 88 constellations in both the northern and southern hemisphere, helping you map the star patterns, from Ursa Major and Orion to Pavo and Aquarius. The Practical Astronomer also contains monthly star charts that follow the changing positions of stars in the night sky through the year. Discover the solar system and know about other objects, such as satellites and space stations, that light up the sky. A reference section at the back of the book provides handy information about every planet and includes information about eclipses. Become an accomplished amateur astronomer with this practical guide.

Marvel at the wonders of the universe, from stars and planets to black holes and nebulae, in this exploration of our solar system and beyond. Universe opens with a look at astronomy and the history of the Universe, using 3D artworks to provide a comprehensive grounding in the fundamental concepts of astronomy, including the basic techniques of practical astronomy. The core of the book is a tour of the cosmos

covering the Solar System, the Milky Way, and galaxies beyond our own. Explanatory pages introduce different celestial phenomena, such as galaxies, and are followed by catalogs that profile the most interesting and important examples. A comprehensive star atlas completes the picture, with entries on each of the 88 constellations and a monthly sky guide showing the night sky as it appears throughout the year as viewed from both the northern and southern hemispheres.

Covering both homemade and commercial products, this book provides the reader with simple and straightforward information about the modeling, building, and use of binoscopes. Binoscopes can be thought of as binoculars enlarged to the size of telescopes - essentially, a combination of the two. Constructing a binoscope is easier than most people think, but it still demands attention to detail and proper background knowledge. The author goes on to provide additional information about the products currently on the market, should the reader choose to purchase one instead of building it. Lastly, the book also compares binoscopes with telescopes in great detail, outlining the differences the reader can expect to see in the night sky from using both. The celestial views obtained with a binoscope, compared to a single telescope of the same aperture, are a very different experience. The new edition emphasizes the obvious advantages of viewing celestial objects through a binoscope. There are also many new photos and additional information on the latest equipment and some very special and rare equipment a collector might be interested in. Newly added cartoons and additional images of beautiful deep sky objects in each of the chapters makes reading the book a more enjoyable experience. Finally, there is a new comet discovery form and guide to follow for such discoveries, and a complete list of Messier objects for those interested in searching for these.

For all but the simplest star-trail pictures, photographing the night sky involves machinery to track the stars, and the task becomes even more complicated when photographing very small or very faint objects that require high magnification or very long exposure times. Astrophotography for Amateurs presents equipment and techniques, features practical hints and tips from the experts, including coverage of traditional "wet" photography, CCD imaging, and computerized image enhancement. There are sections on photographing different classes of astronomical object from the moon to faint nebulae, as well as a detailed look at the equipment needed.

The Meade ETX range of telescopes is one of the most successful ever made. It is low-cost, has sold in its tens of thousands, and is available in almost every country. Here, ETX expert Mike Weasner reveals everything any amateur astronomer ever wanted to know about the telescope. First book dedicated entirely to the ETX. Written by an acknowledged world authority. Describes the "best" 100 objects to begin observing. Contains detailed hints and tips aimed at getting the best out of the ETX. Features imaging (photographic and digital) as well as visual observing.

For anyone who's ever looked at the night sky and wanted to know more about the galaxy around them, The Practical Astronomer offers a comprehensive guide to discovering and understanding the mysteries of the solar system and beyond. Illustrated with specially commissioned photography and artwork, and using clear, easy-to-follow text, The Practical Astronomer takes you on a step-by-step journey from the basics of what can be seen with the naked eye from your own backyard, to how you can view more distant objects such as the planets of the solar system, and even galaxies far, far away. The book opens with an explanation of the fundamentals of astronomy, detailing when, where, and how to look at the night sky. It goes on to cover the necessary equipment and clothing that the amateur astronomer needs, reviewing optical equipment such as binoculars and telescopes, how they work and how to use them. A special section focuses on photography and covers the "how-to's" of capturing beautiful images of what you see. The Practical Astronomer aims to foster an awareness and understanding of what you're looking at-be it a planet, star, or asteroid. Different sections are devoted to looking at how the night sky changes, whether that's because it's viewed from a different place in the world or at a different time of year. Star charts and detailed maps of the night sky are included to aid budding astronomers in their quest to know more about this fascinating subject.

All new text, some photography re-use, although no disclaimer will be needed. This is a new, fresh series of Nature Guides with all-new content. With a clean, modern design, these books are perfect for the beginner naturalist and family reference. From trees to rocks and minerals, and birds to stars and planets, each volume provides a thorough introduction and detailed, clearly illustrated profiles of hundreds of examples from within that subject area. Each book is packed with stunning photography, and key information is provided by expert contributors. The books are carefully structured, with catalog entries organized into easily understood groups that the newcomer will have no difficulty in navigating and the more experienced reader will appreciate. Each profile centers on a high-impact commissioned image of the subject, allowing instant identification, and is accompanied by concise, authoritative text. Additional images provide context, while a data panel summarizes key facts about each example. Each title opens with an introductory section that explains each subject in detail. This is followed by a comprehensive illustrated catalog. A glossary of key terms and a detailed index complete each volume. About the Imprimatur: The Smithsonian Institution is the largest museum complex in the world and a research center for research dedicated to public education and scholarship in the arts, sciences, and history.

Star charts, step-by-step projects, photos, and more: "The Total Skywatcher's Manual is a fun book, but more importantly, it's a useful book." —Sky & Telescope With fully illustrated star charts, gorgeous astrophotography, and step-by-step project instruction, this is the only guide you need to navigate the night (and day) sky. Learn about the phases of the moon, how to conduct your own deep-sky observations, how the universe is expanding, our search for life on other planets, meteors vs. meteorites, sunspots and solar flares, best eclipse-viewing techniques—everything you need to know to appreciate the wonder of our universe. The Total Skywatcher's Manual will help stargazers, comet-spotters, and planet-seekers: Choose the best telescope Identify constellations and objects in the night sky Search for extraterrestrial phenomena Plan star parties Capture beautiful space imagery and much more For well over a century, the Astronomical Society of the Pacific has provided resources, tools, and information to astronomy enthusiasts, including amateur astronomers, families, and science educators. Now they draw on their wide-ranging expertise to guide you through the skies.

This book is based around the author's beautiful and sometimes awe-inspiring color images and mosaics of deep-sky objects. The book describes how similar "Hubble class" images can be created by amateur astronomers in their back garden using commercially available telescopes and CCD cameras. Subsequent processing and image enhancement in the "electronic darkroom" is covered in detail as well. A range of telescopes and equipment is considered, from the author's 11-inch with Hyperstar camera, down to more affordable instruments. Appendices provide links to free software – not available from a single source – and are themselves an invaluable resource.

Learn how to photograph the total solar eclipse of August 21, 2017, with a wide range of techniques and camera gear: Simple

point-and-shoot and mobile phone cameras DSLR and Mirrorless still cameras Video cameras Wide-angle lenses and long telephotos Telescopes, both tracking the sky and untracked In this 290-page ebook, you'll learn: What to expect to see and what to shoot. How to shoot simple grab shots and eclipse "selfies." What types of cameras are best. What tripod features are best. What filters to use and when to remove them. How to shoot wide-angle still images. How to set up time-lapse sequences. How to frame scenes for time-lapses and composites. How to plan great shots above scenic landmarks. How to shoot close-ups of totality. What focal lengths are best for framing the Sun. What types of telescopes and mounts are best. How to align tracking mounts in the daytime. How to focus and avoid image blurring from sky motion. What the best exposures will be. When to shoot on auto exposure vs. manual. How to plan shoots with single or multiple cameras. How to automate a camera. Tips on last-minute moves to avoid clouds. What can go wrong and how to avoid the common mistakes. How to capture the eclipse and still see it! And finally ... How to process your eclipse photos, from simple wide-angle scenes to complex multi-exposure stacks and composites The book contains:

- Dozens of sky charts made specifically for the 2017 eclipse, and for both the eastern and western United States, to show how to frame the scene with a range of focal lengths, and for planning your shoot.
- Active links to websites for equipment suppliers and for detailed eclipse maps and times for your site.
- Step-by-step tutorials take you through processing, from basic developing of Raw files, to assembling time-lapse movies, and stacking images for composites, plus blending of multiple exposures with luminosity masks.

What's in the book — Chapter 1: Introduction A summary of the techniques the book explains. Chapter 2: The Eclipse Experience What you will see and experience during the eclipse, with the naked eye and through optics. Eclipse etiquette. Chapter 3: Where to Go Where you need to be in the path of totality. Plan B options. Chapter 4: Eclipse Photo Fundamentals Choosing filters. Shooting partial phases vs. totality. Chapter 5: Shooting Wide-Angle Stills Choosing cameras (from simple to complex) and lenses. Choosing exposures and other settings. Framing options, for capturing easy but dramatic wide-angle scenes and panoramas. Chapter 6: Shooting Close-Up Stills Choosing cameras, lenses, and telescopes for detailed close-ups. Tracking mounts vs. untracked tripods. Setting up a tracking telescope. Focusing tips. Recommended exposure sequences. Framing the corona. Practice tips for shooting the Moon. Chapter 7: Shooting Time-Lapses Setting up wide-angle and close-up time-lapses. Framing the motion of the Sun. Tracking the Sun. Controlling the camera. Chapter 8: Shooting Video Video camera and lens options. Setting exposures. Chapter 9: Shooting Composites Planning a multiple exposure composite. Framing the scene. Wide-angle vs. close-up sequences. Chapter 10: What Can Go Wrong? Common equipment and user malfunctions! Checklists. Operating multiple cameras and shooting plans. Automating a camera. Cloudy options. Contingency plans. Chapter 11: Processing Eclipse Images Workflows. Photoshop basics. Developing Raw images. Processing wide-angle scenes and close-ups of the corona. Processing time-lapse sequences. Stacking composites. Stacking and merging multi-exposure blends with HDR and luminosity masks. Chapter 12: Conclusion Advice for eclipse newbies. Future eclipses. Where to learn more – for detailed maps and information on your site.

This book shows amateur astronomers how to use one-shot CCD cameras, and how to get the best out of equipment that exposes all three color images at once. Because this book is specifically devoted to one-shot imaging, "One-Shot Color Astronomical Imaging" begins by looking at all the basics - what equipment will be needed, how color imaging is done, and most importantly, what specific steps need to be followed after the one-shot color images are taken. What is one-shot color imaging? Typically, astronomical cooled-chip CCD cameras record only one color at a time - rather like old-fashioned black & white cameras fitted with color filters. Three images are taken in sequence - in red, blue, and green light - and these are then merged by software in a PC to form a color image. Each of the three images must be taken separately through a suitable color filter, which means that the total exposure time for every object is more than tripled. When exposure times can run into tens of minutes or even hours for each of the three colors, this can be a major drawback for the time-pressed amateur. "One-Shot Color Astronomical Imaging" describes the most cost-effective and time-efficient way for any amateur astronomer to begin to photograph the deep-sky.

Computers and Astronomy Perhaps every generation of astronomers believes that their telescopes are the best that have ever been. They are surely all correct! The great leap of our time is that computer-designed and machined parts have led to more accurately made components that give the astronomer ever better views. The manual skills of the craftsman mirror grinder have been transformed into the new-age skills of the programmer and the machine maker. (The new products did not end the work of craftsman telescope makers, though. Many highly skilled amateur/professional opticians continued to produce good-quality mirrors that are still seen today. ) Amateur-priced telescopes are now capable of highly accurate tracking and computer control that were once only the province of professionals. This has greatly increased the possibilities of serious astronomy projects for which tailor-made software has been developed. Add a CCD camera to these improved telescopes (see Chap. 3), and you bring a whole new dimension to your astronomy (see Fig. 1. 1). Look Before You Leap! But first, a word of caution. Unless you are already familiar with astronomy and basic telescopes, it is not wise to start spending large amounts of money on a well-featured telescope. Such an instrument might otherwise be subsequently abandoned due to a perceived overcomplexity coupled with a waning interest. Here is a one-volume guide to just about everything computer-related for amateur astronomers! Today's amateur astronomy is inextricably linked to personal computers. Computer-controlled "go-to" telescopes are inexpensive. CCD and webcam imaging make intensive use of the technology for capturing and processing images. Planetarium software provides information and an easy interface for telescopes. The Internet offers links to other astronomers, information, and software. The list goes on and on. Find out here how to choose the best planetarium program: are commercial versions really better than freeware? Learn how to optimise a go-to telescope, or connect it to a lap-top. Discover how to choose the best webcam and use it with your telescope. Create a mosaic of the Moon, or high-resolution images of the planets... Astronomy with a Home Computer is designed for every amateur astronomer who owns a home computer, whether it is running Microsoft Windows, Mac O/S or Linux. It doesn't matter what kind of telescope you own either - a small refractor is just as useful as a big "go-to" SCT for most of the projects in this book. Viewing and Imaging the Solar System: A Guide for Amateur Astronomers is for those who want to develop their ability to observe and image Solar System objects, including the planets and moons, the Sun, and comets and asteroids. They might be beginners, or they may have already owned and used an astronomical telescope for a year or more. Newcomers are almost always wowed by sights such as the rings of Saturn and the moons of Jupiter, but have little idea how to find these objects for themselves (with the obvious exceptions of the Sun and Moon). They also need guidance about what equipment, besides a telescope, they will need. This book is written by an expert on the Solar System, who has had a lot of experience with outreach programs, which teach others how to make the most of relatively simple and low-cost equipment. That does not mean that this book is not for serious amateurs. On the contrary, it is designed to show amateur astronomers, in a relatively light-hearted—and math-free way—how to

become serious.

Any amateur astronomer who is interested in astrophotography, particularly if just getting started, needs to know what objects are best for imaging in each month of the year. These are not necessarily the same objects that are the most spectacular or intriguing visually. The camera reveals different things and has different requirements. What objects in the sky tonight are large enough, bright enough, and high enough to be photographed? This book reveals, for each month of the year, the choicest celestial treasures within the reach of a commercial CCD camera. Helpful hints and advice on framing, exposures, and filters are included. Each deep sky object is explained in beautiful detail, so that observers will gain a richer understanding of these astronomical objects. This is not a book that dwells on the technology of CCD, Webcam, wet, or other types of astrophotography. Neither is it a book about in-depth computer processing of the images (although this topic is included). Detailed discussions of these topics can be found in other publications. This book focuses on what northern latitude objects to image at any given time of the year to get the most spectacular results.

Philip's Stargazing With Mark Thompson provides the perfect introduction to the fascinating hobby of astronomy for beginners, written by TV's favourite astronomer. With 30 years' experience in observational astronomy and helping hundreds of newcomers get started in their new hobby, Mark Thompson takes everything he has learned and leads his readers skilfully through their early stargazing experiences in this brand-new book - Philip's Stargazing With Mark Thompson. He provides a wealth of knowledge, with valuable hints and tips to aid beginners in their first steps in astronomy. Not only does Mark demonstrate great observational techniques and how to find the brighter objects in the sky, but he guides his readers through the important steps of choosing and using a telescope. This is a book that will not only act as a guide to the novice astronomer but, by drawing on Mark's own experiences, will be a companion to share in the wonders of the night sky.

In The Art of Astrophotography, astronomer and Astronomy Now columnist Ian Morison provides the essential foundations of how to produce beautiful astronomical images. Every type of astroimaging is covered, from images of the Moon and planets, to the constellations, star clusters and nebulae within our Milky Way Galaxy and the faint light of distant galaxies. He achieves this through a series of worked examples and short project walk-throughs, detailing the equipment needed - starting with just a DSLR (digital single lens reflex) camera and tripod, and increasing in complexity as the book progresses - followed by the way to best capture the images and then how, step by step, these may be processed and enhanced to provide results that can rival those seen in astronomical magazines and books. Whether you are just getting into astrophotography or are already deeply involved, Morison's advice will help you capture and create enticing astronomical images.

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