

## Autoguided Reviews

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.

Amateur astronomers who have been disappointed by the results of an observing session can take comfort in the guidance of this book, which advises how to still gain useful experience in seemingly "failed" nights at the telescope. In a world with imperfect seeing conditions, incredible observing sessions are often mixed with less inspiring ones, discouraging the amateur observer. This book is designed to minimize subsequent disappointment for astronomers who encounter a few bad observing sessions, helping novice observers take something worthwhile away each and every time they go out under the night sky, regardless of the observations that were originally planned. Almost every observer remembers his first sight of ringed Saturn, hanging in the blackness of space. Practitioners agree that there is something special about visual observing. Real-time observations at the eyepiece can provide fleeting yet intense feelings that connect us with the universe in unique ways. But when expectations aren't met at the eyepiece, there are other ways to profit from the practice of astronomy. These rewards, though less showy, are well worth cultivating. This is a book that will help the reader see what constitutes a "successful" visual observing session. It explains the nature of the objects that the observer is seeing and advises how best to use their equipment. There are many hints and tips about how best to locate, recall, and record observations, including suggestions for trips to areas where there are dark skies and to public observatories. Amateur astronomy is a journey from the urban backyard all the way to dark rural skies, and with this guide the journey can be smooth.

State-of-the-art and future technology in stellar photometry in a comprehensive and timely review.

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.

In the last few years, digital SLR cameras have taken the astrophotography world by storm. It is now easier to photograph the stars than ever before! They are compact and portable, flexible to adapt with different lenses and for telescope use, and above all DSLR cameras are easy and enjoyable to use. In this concise guide, experienced astrophotography expert Michael Covington outlines the simple, enduring basics that will enable you to get started, and help you get the most from your equipment. He covers a wide selection of equipment, simple and advanced projects, technical considerations and image processing techniques. Unlike other astrophotography books, this one focuses specifically on DSLR cameras, not astronomical CCDs, non-DSLR digital cameras, or film. This guide is ideal for astrophotographers who wish to develop their skills using DSLR cameras and as a friendly introduction to amateur astronomers or photographers curious about photographing the night sky.

Written by one of the astronomers who 'lived the dream' of working there this book is a retrospectively expanded diary featuring the 'birth and long life' of what was a truly innovative telescope. Based on input received from people involved in its planning, building, operation, and many scientists who observed with it, the author tells this success story of The United Kingdom Infrared Telescope (UKIRT). Conceived in the mid 1970's as a cheap and cheerful light-bucket for the newly emerging field of infrared astronomy it has re-invented itself once a decade to remain at the forefront of infrared astronomy for more than 30 years. Even in 2012 / 2013, when ironically it faced almost certain closure, it remained one of the most scientifically productive telescopes in the world. Everybody, including amateur and professional astronomers, interested in real astronomy projects will enjoy reading that story and meet (again) the persons who lived it.

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.

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.

At first glance, the challenge of astrophotography may appear daunting. But not only are spectacular results possible, they are easy to learn with the step-by-step instructions provided in this handy resource, which shows amateurs how to produce images to rival a professional observatory.

Today's photographic equipment allows amateurs to take pictures of the stars that far surpass images taken just a few decades ago by even the largest observatories-and this book will teach you how. Author and world-renowned astrophotographer Thierry Legault teaches the art and techniques of astrophotography: from simple camera-on-tripod night-scene imaging of constellations, star trails, eclipses, artificial

satellites, and polar auroras to more intensive astrophotography using specialized equipment for lunar, planetary, solar, and deep-sky imaging. Legault shares advice on equipment and guides you through techniques to capture and process your images to achieve spectacular results. Astrophotography provides the most thorough treatment of the topic available. This large-format, richly illustrated book is intended for all sky enthusiasts—newcomers and veterans alike. Learn how to: Select the most useful equipment: cameras, adapters, filters, focal reducers/extenders, field correctors, and guide telescopes Set up your camera (digital, video, or CCD) and your lens or telescope for optimal results Plan your observing sessions Mount the camera on your telescope and focus it for razor-sharp images Polar-align your equatorial mount and improve tracking for pin-point star images Make celestial time-lapse videos Calculate the shooting parameters: focal length and ratio, field of view, exposure time, etc. Combine multiples exposures to reveal faint galaxies, nebulae details, elusive planetary structures, and tiny lunar craters Adjust contrast, brightness, light curves, and colors Postprocess your images to fix defects such as vignetting, dust shadows, hot pixels, uneven background, and noise Identify problems with your images and improve your results

The International Scientific Spring Meeting of the Astronomische Gesellschaft (AG) held at Bamberg in April 1991 was devoted to "Variabilities in Stars and Galaxies". Time-dependent phenomena are observed in a wide range of astronomical objects. They are caused by different physical mechanisms (for example by pulsation, by accretion, or by dramatic eruptive events in connection with mass outflow) producing observable intensity variations through all wavelengths. Many of the papers in this volume are concerned with galactic stars showing such behaviour (for example cataclysmic variables, symbiotic stars, luminous blue variables (LBVs) and novae). Intrinsic variations of the magnetic field structure on observable time scales are, for instance, a peculiarity of cool, solar-like stars and represent a useful tool to study differential rotation and cycles of activity. Recent results on the investigation of gas motions in the inner regions of the Milky Way system, a study of the bipolar galaxy M 82, observations of variable extragalactic radio sources, the variability of emission lines in active galactic nuclei (AGN) as well as continuum variations of quasars and AGN are discussed by several authors. The yearbook series *Reviews in Modern Astronomy* of the AG to bring the scientific events of the was established in 1988 in order meetings of the society to the attention of the worldwide astronomical community.

*Astronomy and Astrophysics Abstracts* aims to present a comprehensive documentation of the literature concerning all aspects of astronomy, astrophysics, and their border fields. It is devoted to the recording, summarizing, and indexing of the relevant publications throughout the world. *Astronomy and Astrophysics Abstracts* is prepared by a special department of the Astronomisches Rechen-Institut under the auspices of the International Astronomical Union. Volume 43 records literature published in 1987 and received before August 15, 1987. Some older documents which we received late and which are not surveyed in earlier volumes are included too. We acknowledge with thanks contributions of our colleagues all over the world. We also express our gratitude to all organizations, observatories, and publishers which provide us with complimentary copies of their publications. Starting with Volume 33, all the recording, correction, and data processing work was done by means of computers. The recording was done by our technical staff members Ms. Helga Ballmann, Ms. Beate Gobel, Ms. Monika Kohl, Ms. Sylvia Matyssek, Ms. Doris Schmitz-Braunstein, Ms. Utta-Barbara Stegemann. Mr. Jochen Heidt and Mr. Kristopher Polzine supported our task by careful proof reading. It is a pleasure to thank them all for their encouragement. Heidelberg, October 1987

The Editors  
Contents  
Introduction . . . . . 1  
Concordance Relation: PHYS-AAA 3  
Abbreviations 5  
Periodicals, Proceedings, Books, Activities 001  
Periodicals . . . . . 10  
002 Bibliographical Publications, Documentation, Catalogues, Data Bases 50  
003 Books . . . . .

This book is for anyone who owns, or is thinking of owning, a Vixen Star Book Ten telescope mount or its predecessor. A revolution in amateur astronomy has occurred in the past decade with the wide availability of high tech, computer-driven, Go-To telescopes. Vixen Optics is leading the way by offering the Star Book Ten system, with its unique star map graphics software. The Star Book Ten is the latest version of computer telescope control using star map graphics as a user interface, first introduced in the original Star Book first offered in 2003. The increasingly complicated nature of this software means that learning to optimize this program is not straightforward, and yet the resulting views when all features are correctly deployed can be phenomenal. After a short history of computerized Go-To telescopes for the consumer amateur astronomer market, Chen offers a treasury of technical information. His advice, tips, and solutions aid the user in getting the most out of the Star Book Ten system in observing sessions.

The New Amateur Astronomer Springer Science & Business Media

A definitive handbook to photographing the night sky using DSLR cameras, including projects for both beginners and more advanced enthusiasts.

This guide provides useful insight for first-time telescope buyers as well as experienced amateurs. It examines the advantages and disadvantages of different types of telescopes, mountings, and accessories—ranging from refractors and reflectors to computer controlled drives and CCD cameras. The author also covers observation techniques, photographic equipment, astronomical software, as well as equipment care and maintenance.

This book serves as a comprehensive guide for using a Nexstar Evolution mount with WiFi SkyPortal control, walking the reader through the process for aligning and operating the system from a tablet or smartphone. The next generation Go-To mount from Celestron, this is compatible not only with the Nextstar Evolution but also with older mounts. It is the ideal resource for anyone who owns, or is thinking of owning, a Nexstar Evolution telescope, or adapting their existing Celestron mount. Pros and cons of the system are thoroughly covered with a critical depth that addresses any possible question by users. Beginning with a brief history of Go-To telescopes and the genesis of this still new technology, the author covers every aspect of the newly expanding capability in observing. This includes the associated Sky Portal smartphone and tablet application, the transition from the original Nexstar GoTo system to the new SkyPortal system, the use of the Sky Portal application with its Sky Safari 4 basic software and Celestron WiFi adaptations, and discussions on the use of SkyPortal application using the Celestron adapter on older Celestron mounts. Comments and recommendations for equipment enable the reader to successfully use and appreciate the new WiFi capability without becoming overwhelmed. Extensively illustrated using actual screenshots from the program interface, this is the only guide to the Nextstar SkyPortal an observer will need.

There are many books covering different facets of astrophotography, but few of them contain all the necessary steps for beginners in one accessible place. *Astrophotography is Easy!* fills that void, serving as a guide to anybody interested in the subject but starting totally from scratch. Assuming no prior experience, the author runs through the basics for how to take astrophotos using just a camera—including cell phones and tablets—as well as a telescope and more sophisticated equipment. The book includes proven techniques, checklists, safety guidelines, troubleshooting tips, and more. Each chapter builds upon the last, allowing readers to master basic techniques before moving on to more challenging material. Also included is a comprehensive list of additional books and resources on a variety of topics so readers can continue expanding their skills. *Astrophotography Is Easy!* doesn't simply teach you the basic skills for becoming an astrophotographer: it provides you with the foundations you will need for a lifelong pursuit.

Comets have inspired wonder, excitement and even fear ever since they were first observed. But they are important members of the solar system, that contain material from early in the life of the system, held in deep-freeze. This makes them key in our understanding of the formation and evolution of many Solar System bodies. Recent ground- and space-based observations have changed much in our understanding of comets. *Comets, and How to Observe Them* gives a summary of our current knowledge and describes how amateur astronomers can contribute to the body of scientific knowledge of comets. This book contains many practical examples of how to construct comet light-curves, measure how fast a comet's coma expands, and determine the rotation period of the nucleus. All these examples are illustrated with drawings and photographs. Because of their unpredictable nature comets are always interesting and sometime spectacular objects to observe and image. The second part of the book therefore takes the reader through the key observing techniques that can be used with commercially available modern observing equipment, from basic observations to more scientific measurements.

Since comet Shoemaker-Levy collided with the planet Jupiter with stupendous force in 1994 there has been an upsurge of amateur interest in comets. Most comets are first discovered by amateur astronomers because so there are many amateurs looking for them, and techniques and instruments have improved dramatically in the past few years. This comprehensive book (with an accompanying CD-ROM) is at once a "primer" for comet hunters and a text for advanced amateurs and will thus appeal to a wide audience of amateur astronomers

The *Astrophotography Manual, Second Edition* is for photographers ready to move beyond standard SLR cameras and editing software to create beautiful images of nebulae, galaxies, clusters, and the stars. Beginning with a brief astronomy primer, this book takes readers through the full astrophotography process, from choosing and using equipment to image capture, calibration, and processing. This combination of technical background and hands-on approach brings the science down to earth, with practical methods to ensure success. This second edition now includes: Over 170 pages of new content within 22 new chapters, with 600 full-color illustrations. Covers a wide range of hardware, including mobile devices, remote control and new technologies. Further insights into leading software, including automation, Sequence Generator Pro and PixInsight Ground-breaking practical chapters on hardware and software as well as alternative astrophotography pursuits

Proceedings of SPIE present the original research papers presented at SPIE conferences and other high-quality conferences in the broad-ranging fields of optics and photonics. These books provide prompt access to the latest innovations in research and technology in their respective fields. Proceedings of SPIE are among the most cited references in patent literature.

Amateur astronomy has changed beyond recognition in less than two decades. The reason is, of course, technology. Affordable high-quality telescopes, computer-controlled 'go to' mountings, autoguiders, CCD cameras, video, and (as always) computers and the Internet, are just a few of the advances that have revolutionized astronomy for the twenty-first century. Martin Mobberley first looks at the basics before going into an in-depth study of what's available commercially. He then moves on to the revolutionary possibilities that are open to amateurs, from imaging, through spectroscopy and photometry, to patrolling for near-earth objects - the search for comets and asteroids that may come close to, or even hit, the earth. *The New Amateur Astronomer* is a road map of the new astronomy, equally suitable for newcomers who want an introduction, or old hands who need to keep abreast of innovations. From the reviews: "This is one of several dozen books in Patrick Moore's 'Practical Astronomy' series. Amid this large family, Mobberley finds his niche: the beginning high-tech amateur. The book's first half discusses equipment: computer-driven telescopes, CCD cameras, imaging processing software, etc. This market is changing every bit as rapidly as the computer world, so these details will be current for only a year or two. The rest of the book offers an overview of scientific projects that serious amateurs are carrying out these days. Throughout, basic formulas and technical terms are provided as needed, without formal derivations. An appendix with useful references and Web sites is also included. Readers will need more than this book if they are considering a plunge into high-tech amateur astronomy, but it certainly will whet their appetites. Mobberley's most valuable advice will save the book's owner many times its cover price: buy a quality telescope from a reputable dealer and install it in a simple shelter so it can be used with as little set-up time as possible. A poor purchase choice and the hassle of setting up are why most fancy telescopes gather dust in their owners' dens. Summing Up: Highly recommended. General readers; lower- and upper-division undergraduates." ( T. D. Oswalt, CHOICE, March 2005)

This book is written for beginning to intermediate CCD astrophotographers. It is a complete reference on every aspect of CCD imaging, from selecting equipment to advanced processing techniques.

These are the proceedings of an international meeting hosted by the Royal Observatory, Edinburgh, to commemorate the 30th anniversary of the dedication of the UKIRT, the United Kingdom InfraRed Telescope. The volume comprises 31 professional level papers. The first part of the book has 10 thorough reviews of the conception, design and build of the telescope, as well as accounts of some its key instruments such as IRCAM (the common-user infrared camera), CGS4 (the fourth Cooled Grating Spectrometer) and the Wide Field Camera. The second part of the book comprises 14 reviews of scientific achievements during its twenty years of visitor mode operations. The final part of the book is a series of 7 reviews of the results from the multiple surveys being done as part of UKIDSS (UKIRT Infrared Deep Sky Survey). The authors are all experts in their respective fields, for example instrument scientists, operations staff and leading astronomers.

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.

The touchstone for contemporary stargazers. This classic, groundbreaking guide has been the go-to field guide for both beginning and experienced amateur astronomers for nearly 30 years. The fourth edition brings Terence Dickinson and Alan Dyer's invaluable manual completely up-to-date. Setting a new standard for astronomy guides, it will serve as the touchstone for the next generation of stargazers as well as longtime devotees. Technology and astronomical understanding are evolving at a breathtaking clip, and to reflect the latest information about observing techniques and equipment, this massively revised and expanded edition has been completely rebuilt (an additional 48 pages brings the page count to 416). Illustrated throughout with all-new photographs and star charts, this edition boasts a refreshed design and features five brand-new chapters, including three essential essays on binocular, telescope and Moon tours by renowned astronomy writer Ken Hewitt-White. With new content on naked-eye sky sights, LED lighting technology, WiFi-enabled telescopes and the latest advances in binoculars, telescopes and other astronomical gear, the fourth edition of *The Backyard Astronomer's Guide* is sure to become an indispensable reference for all levels of stargazers. New techniques for observing the Sun, the Moon and solar and lunar eclipses are an especially timely addition, given the upcoming solar eclipses in 2023 and 2024. Rounding out these impressive offerings are new sections on dark sky reserves, astro-tourism, modern astrophotography and cellphone astrophotography, making this book an enduring must-have guide for anyone looking to improve his or her astronomical viewing experience. *The Backyard Astronomer's Guide* also features a foreword by Dr. Sara Seager, a Canadian-American astrophysicist and planetary scientist at the Massachusetts Institute of Technology and an internationally recognized expert in the search for exoplanets. *The Astrophotography Manual* is for those photographers who aspire to move beyond using standard SLR cameras and editing software, and who are ready to create beautiful images of nebulae, galaxies, clusters, and the solar system. Beginning with a brief astronomy primer, this book takes readers through the full astrophotography process, from choosing and using equipment through image capture, calibration, and processing. This combination of technical background information and the hands-on approach brings the science down to earth with a practical method to plan for success. Features include: Over 400 images, graphs, and tables to illustrate these concepts A wide range of hardware to be used, including smartphones, tablets, and the latest mount technologies How to utilize a variety of leading software such as Maxim DL, Nebulosity, Sequence Generator Pro, Photoshop, and PixInsight Case studies showing how and when to use certain tools and overcoming technical challenges How sensor performance and light pollution relate to image quality and exposure planning

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