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KEY=SMALL - KHAN CHRIS

Hunting and Imaging Comets Springer Science & Business Media For many astronomers, the holy grail of observation is to discover a comet, not least because comets always bear the name of their discoverer! Hunting and Imaging Comets was written for comet hunters and digital imagers who want to discover, rediscover, monitor, and make pictures of comets using astronomical CCD cameras and DSLRs. The old days of the purely visual comet hunter are pretty much over, but this is not to say that amateurs have lost interest in finding comets. The books also covers the discovery of comet fragments in the SOHO image data, CCD monitoring of older comets prone to violent outbursts, the imaging of new NEOs (Near Earth Objects) that have quite often been revealed as comets - not asteroids - by amateur astronomers, and the finding of recent comets impacting Jupiter. **Observing Variable Stars** Springer Science & Business Media Observing variable stars - stars that change brightness, either in a regular way or unpredictably - is one of the major contributions amateur astronomers make to science. There are 36,000 variable stars listed in the General Catalogue of Variable Stars, so it is clearly impossible for the limited number of professional observatories to target even the majority of them. That's where the amateur astronomers come in - thousands of them turning their telescopes to the sky every night. Variable star observing is the popular 'real science' activity for by amateur observers, and this book provides all the detail needed for newcomers and experienced astronomers alike. **Twenty-Five Astronomical Observations That Changed the World And How To Make Them Yourself** Springer Science & Business Media "Twenty-Five Astronomical Observations That Changed the World" takes twenty-five journeys through space, back in time and into human history. We begin with the simplest sight of the Tycho Crater on the Moon, through a repeat of Galileo's observations of Jupiter's moons, and then move out towards the nebulae, stars, and galaxies. The astronomical observations repeat the original groundbreaking discoveries that have changed our understanding of science and ourselves. This title contains graded observing challenges from the straightforward to the more difficult (in chapter order). It offers clear observing tips and lots of practical help, presuming no prior in-depth knowledge of equipment. Binoculars and/or a small astronomical telescope are all that is required for most of the observations. Secondly, it explores for each observation the science of what is seen, adding to the knowledge and enjoyment of amateur astronomers and offering lots of reading for the cloudy nights when there is not a star in view. Thirdly, the book puts the amateur astronomers' observations into a wider perspective. "Twenty-Five Astronomical Observations That Changed the World" makes the observer part of that great story of discovery. Each chapter, each observing challenge, shows how to observe and then how to look with understanding. The projects begin with practicalities: where the object is, how best is it observed and with what appropriate equipment (usually a small-to-medium aperture amateur telescope, binoculars, even the naked eye). "Twenty-Five Astronomical Observations that Changed the World" guides even the inexperienced amateur astronomer - beginners can use the book - around a variety of night-sky objects, and reminds the more experienced how they can best be seen. These practical observations put us in contact with all the history and culture surrounding them: through scientific speculation and literature to those first fuzzy images made in 1959 by the Russian space probe Luna 3. **Astronomy with a Home Computer** Springer Science & Business Media 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. **Telescopes and Techniques** Springer Science & Business Media “Telescopes and Techniques” has proved itself in its first edition, having become probably one of the most widely used astronomy texts, both for numerate amateur astronomers and for astronomy and astrophysics undergraduates. The first and second editions of the book were widely used as set texts for introductory practical astronomy courses in many universities. This book guides the reader through the mathematics, physics and practical techniques needed to use telescopes (from small amateur models to the larger instruments installed in many colleges) and to observe objects in the sky. Mathematics to around Advanced Placement standard (US) or A level (UK) is assumed, although High School Diploma (US) or GCSE-level (UK) mathematics plus some basic trigonometry will suffice most of the time. Most of the physics and engineering involved is described fully and requires no prior knowledge or experience. This is a ‘how to’ book that provides the knowledge and background required to understand how and why telescopes work. Equipped with the techniques discussed in this book, the observer will be able to operate with confidence his or her telescope and to optimize its performance for a particular purpose. In principle the observer could calculate his or her own predictions of planetary positions (ephemerides), but more realistically the observer will be able to understand the published data lists properly instead of just treating them as ‘recipes.’ When the observer has obtained measurements, he/she will be able to analyze them in a scientific manner and to understand the significance and meaning of the results. “Telescopes and Techniques, 3rd Edition” fills a niche at the start of an undergraduate astronomer’s university studies, as shown by it having been widely adopted as a set textbook. This third edition is now needed to update its material with the many new observing developments and study areas that have come into prominence since it was published. The book concentrates on the knowledge needed to understand how small(ish) optical telescopes function, their main designs and how to set them up, plus introducing the reader to the many ways in which objects in the sky change their positions and how they may be observed. Both visual and electronic imaging techniques are covered, together with an introduction to how data (measurements) should be processed and analyzed. A simple introduction to radio telescopes is also included. Brief coverage of the most advanced topics of photometry and spectroscopy are included, but mainly to enable the reader to see some of the developments possible from the basic observing techniques covered in the main parts of the book. **Small Astronomical Observatories Amateur and Professional Designs and Constructions** Springer Science & Business Media In Small Astronomical Observatories, Patrick Moore has collected descriptions of amateur and small professional observatories currently in use in Europe and America, showing how many astronomers have built their own observatory, often with effective and sometimes extraordinary improvisations to reduce the cost. There is a photograph of each, along with details of its construction and a foreword written by Patrick Moore. In addition to providing a fascinating study for its own sake, Small Astronomical Observatories offers a unique fund of ideas and practical details for anyone who wants to build an amateur or small professional observatory. **Digital Astrophotography: The State of the Art** Springer Science & Business Media Provides novice to accomplished amateur astronomers with a firm grounding in the basics and successful use of digital astrophotography. Provides examples of the best images, and gives readers hints and tips about how to get the best out of this extraordinary technology. Experts in CCD astronomy from North America and Europe have contributed to this book, illustrating their help and advice with many beautiful colour images – the book is in full color throughout. Techniques range from using simple webcams to highly technical aspects such as supernovae patrolling. Computer processing, stacking and image-enhancement are detailed, along with many hints and tips from the experts. **Astronomical Sketching: A Step-by-Step Introduction** Springer Science & Business Media This book presents the amateur with fine examples of astronomical sketches and step-by-step tutorials in each medium, including pencil, pen and ink, chalks and pastels, painting and computer graphics programs. This unique book can teach almost anyone to create beautiful sketches of celestial objects by following simple, illustrated, step-by-step instructions. Readers can select a chapter related to their preferred class of object, and rapidly learn techniques in several media. Each chapter contains useful information regarding equipment, techniques for preserving and archiving sketches, and suggestions for accurate record keeping. **The New Amateur Astronomer** Springer Science & Business Media 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) **Seeing Stars The Night Sky Through Small Telescopes** Springer Science & Business Media This essential and highly-illustrated guide is for anyone taking their first steps in observational astronomy. It shows what you can expect to see, helping you get the most from your equipment. This unique book gives amateurs the guidance and assurance they need to become more proficient observers. **Photo-guide to the Constellations A Self-Teaching Guide to Finding Your Way Around the Heavens** Springer Science & Business Media "I hope that people all around the world never forget what a wonderful thing it is to lie on your back and look up at the stars" Pete Seeger What is the fascination that constellations hold for people? There are probably as many different answers to that question as there are people. For many, though, the constella tions are the stepping-off point into the fabulous, mind-bending discoveries and concepts of modern astronomy. For others it is their long and intriguing history that beckons. For some people the constellations provide the means for navigation and

orientation over the surface of the Earth, and of course there are the millions who place some faith in horo scopes. But for most people the patterns in the sky are a beautiful part of their environ ment to be treasured alongside the forests, fields and rivers that make life worth living. However just as we are losing our green environment to pollution, so we are losing our sky. The glow from cities across the world swamps the stars in the night sky. Astronomers have had to retreat to remote mountain tops to escape that light pollution. The rest of us must make do with what is available. From the centre of a city, or any other brightly lit area, probably no stars at all will be visible even on the clearest of nights. From the suburbs, the brighter stars should normally be seen. **Observer's Guide to Star Clusters** Springer Science & Business Media Amateur astronomers of all expertise from beginner to experienced will find this a thorough star cluster atlas perfect for easy use at the telescope or through binoculars. It enables practical observers to locate the approximate positions of objects in the sky, organized by constellation. This book was specifically designed as an atlas and written for easy use in field conditions. The maps are in black-and-white so that they can be read by the light of a red LED observer's reading light. The clusters and their names/numbers are printed in bold black, against a "grayed-out" background of stars and constellation figures. To be used as a self-contained reference, the book provides the reader with detailed and up-to-date coverage of objects visible with small-, medium-, and large-aperture telescopes, and is equally useful for simple and computer-controlled telescopes. In practice, GO-TO telescopes can usually locate clusters accurately enough to be seen in a low-magnification eyepiece, but this of course first requires that the observer knows what is visible in the sky at a given time and from a given location, so as to input a locatable object. This is where "The Observer's Guide to Star Clusters" steps in as an essential aid to finding star clusters to observe and an essential piece of equipment for all amateur astronomers. **Astronomy with Small Telescopes Up to 5-inch, 125mm** Springer Science & Business Media Small telescopes, whether simple beginners' telescopes or refined computer-controlled instruments, are gaining popularity fast as technology improves and public interest increases. In this book the author has brought together the experience of small telescope users to provide an insightful look into just what is possible. It is written for newcomers to astronomy and experts. Topics covered include: refractors, reflectors, advanced catadioptric telescopes, and a simple radio telescope. Almost everyone with an interest in practical astronomy will want this book. **Deep Sky Observing The Astronomical Tourist** Springer Science & Business Media Steve Coe has been watching the deep sky from locations near his home in Arizona for almost 20 years. During that time he has accumulated a wealth of knowledge, observations, hints and tips that will help every deep sky observer, regardless of experience. This, his first book, gives detailed practical advice about how to find the best observing site, how to make the most of the time spent there, and what equipment and instruments to take along. There are comprehensive lists of deep sky objects of all kinds, along with Steve's own observations describing how they look through telescopes with apertures ranging from 8 to 36 inches (0.2 - 0.9 m). Most of all, this book is all about how to enjoy astronomy. Steve's enthusiasm and sense of wonder shine through every page as he invites you along on a tour of some of the most beautiful and fascinating sites in the deep sky. **Measure Solar System Objects and Their Movements for Yourself!** Springer Science & Business Media Instead of taking somebody's word for it about the basic size and distance statistics for the solar system, this book shows amateur astronomers how to measure these things for themselves. This is an enriching experience for any amateur astronomer - to understand and personally measure some fundamental astronomical quantities and distances. A basic knowledge of geometry is required, but it is amazing how simple the geometry can be. Readers are led through the geometry as gently as possible - and in a light-hearted way - presuming that most non-academics will have half-forgotten most of their mathematics. The practical astronomical equipment recommended is no more than a typical commercially-made amateur telescope and a camera of some sort - these days a webcam works very well. Apart from that all the reader will need is access to a computer, the know-how to download free software, and an enthusiasm to expand his knowledge of the basis of scientific astronomy. **Go-To Telescopes Under Suburban Skies** Springer Science & Business Media Go-To Telescopes Under Suburban Skies is the first book specifically written for amateur astronomers who own, or who are about to purchase, a computer-controlled 'go-to' telescope. The advantage of the 'go-to' capability is enormous – the telescope can be aimed at any object in the sky with great speed and accuracy – which is why these instruments are so popular. Making the realistic assumption that the observer is using a relatively small telescope and is observing from a backyard in a suburban area, this book provides literally hundreds more targets beyond those offered by the built-in 'nightly tours' that feature on the telescope's computer tours. And instead of wasting many pages on maps and coordinates, it leads the computer to locate the targets, and so has room to suggest many more fascinating deep-sky objects and provide detailed observing lists and information about what's being viewed. **Real Astronomy with Small Telescopes Step-by-Step Activities for Discovery** Springer Science & Business Media This book demonstrates the use of an 80mm refractor and shows how it can be used as a real scientific instrument. The author is an experienced small telescope user and an astronomy educator, and he provides step-by-step instructions for numerous scientific activities. Users will find many activities and projects suitable for an 80mm refractor or 90mm reflector or Maksutov that have not been published elsewhere. Emphasis is on measurement and discovery activities rather than on casual observing. This book will provide amateur observers with the knowledge and skill that will help them make genuine contributions to the field of astronomy. **Starlight An Introduction to Stellar Physics for Amateurs** Springer Science & Business Media This is a book about the physics of stars and starlight. The story of starlight is truly fascinating. Astronomers analyze and interpret the light from stars using photometry and spectroscopy, then inspirational detective work combines with the laws of physics to reveal the temperatures, masses, luminosities and outer structure of these far away points of light. The laws of physics themselves enable us to journey to the very center of a star and to understand its inner structure and source of energy! Starlight provides an in-depth study of stellar astrophysics that requires only basic high school mathematics and physics, making it accessible to all amateur astronomers. Starlight teaches amateur astronomers about the physics of stars and starlight in a friendly, easy-to-read way. The reader will take away a profoundly deeper understanding of this truly fascinating subject – and find his practical observations more rewarding and fulfilling as a result. **Visual Astronomy in the Suburbs A Guide to Spectacular Viewing** Springer Science & Business Media The only practical guide to observing truly spectacular astronomical objects from less than perfect locations. The only book to deal in depth with the application of image intensifiers to real-time astronomy. Gives advice on viewing objects, and on making realistic images by drawing or video. Includes extensive catalogs of spectacular objects that can be seen from suburban sites in both hemispheres. **Aurora Observing and Recording Nature's Spectacular Light Show** Springer Science & Business Media This new book addresses a gap in the literature, offering an explanation of the aurora's causes, how the occurrence of major events may now be predicted, and how amateur observers can go about recording displays. This is the first serious book about aurora written for practical but non-professional observers. It provides a concise accessible description of the various auroral forms and how to record them, illustrated with color images of recent displays. It contains details of 'Space Weather' forecasting websites, how to interpret and use the information given on these, and how to anticipate auroral activity. **Light Pollution Responses and Remedies** Springer Science & Business Media Light-pollution is the modern scourge of optical astronomy. An increasing number of observing sites are in danger of being rendered useless due to the glare of city lighting blotting out the night sky. Professional astronomical observatories are located far from cities, but amateur astronomers often do not have this luxury. This book considers the two available strategies open to Astronomers. The first involves campaigning against light pollution by lobbying Authorities and Standards Organisations, and the second involves using the correct instrumentation. The book contains an extensive detailed catalogue of deep-sky and other objects that - despite what one might believe - can be seen from variously light-polluted sites, for practical observers. **Astronomy of the Milky Way The Observer's Guide to the Northern Milky Way** Springer Science & Business Media This is the first of a two-volume set that deal with the entire Milky Way. This first volume looks at what can be seen predominantly from the Northern Skies. In addition to the descriptive text, there are many star charts and maps, as well as the latest up-to-date images made by observatories around the world and in space, as well as images taken by amateur astronomers. **Blazing a Ghostly Trail ISON and Great Comets of the Past and Future** Springer Science & Business Media Ice and Fire: Great Comets to Come was written because a special celestial event climaxes towards the end of 2013 – the arrival, fresh from the Oort Cloud, of Comet C/2012 S1 (ISON). By all predictions – even the most pessimistic ones – this comet is set to be one of, perhaps the most, dazzling comet seen in modern history and has the astronomical world buzzing with anticipation. Skywatchers have already been primed for C/2012 (ISON) earlier in 2013 with the apparition of another naked-eye comet, C/2011 L4 (PanSTARRS), and following C/2012 S1 (ISON) there is the prospect of 2012 K1 (PanSTARRS) reaching naked eye visibility in August 2014. Future bright cometary prospects are also discussed, taking into account the latest predictions. Examining the origin and nature of comets using examples of great comets from the past, this book sets the scene for the arrival of Comet C/2012 S1 and those following it over the next few years in the inner Solar System. Skywatchers and amateur astronomers can learn how to follow, observe and record comets. There is also a guide on how to keep abreast of the latest cometary discoveries and how to use a variety of reputable sources, including publications, websites, programs and apps to visualize and plan observations. The role of the amateur in cometary discovery also is featured, as well as details on how professional astronomers plan to get the most 'science' out of cometary apparitions, how and why professionals go about discovering comets, and upcoming plans to visit comets with space probes (and later, perhaps, human visits). Illustrations provide historic images of comets, images from space probes and images of the latest bright comets. Orbital plots and easy-to-follow sky charts are also included. This book is a unique guide that sets the scene by giving a comprehensive history of comets and examples of great comets throughout history and informs the reader about the nature and origins of this spectacular occurence. Expectations are fully covered by explaining not only what the regular person can expect to see, but how amateur astronomers can plan observations and what steps the professionals are taking to 'get the most science' from this exciting event. **Stories of Astronomers and Their Stars** Springer Nature This book recounts the stories of the astronomical pioneers who forever changed our views of the cosmos. The chapters delve into their fascinating lives over the centuries, showing how these pivotal minds built upon the work of their predecessors and unlocked the unique properties of specific stars. From ancient astronomy to modern imaging and spectroscopy, each tale at once showcases the pace of scientific discovery and the shared passions that drove these starwatchers. Accompanying the stories are a plethora of constellation and finder charts, stellar coordinates and directions, and suggestions for viewing specific stars, all of which are visible to the naked eye or through a small telescope. In addition, the histories on specific star names and designations are given, along with an overview of the most popular catalogues and online databases that readers can use for reference. **Observing and Measuring Visual Double Stars** Springer Science & Business Media From the reviews: "I recommend it to anyone with an interest in binary stars who wants to learn more about these fascinating objects." (Jocelyn Tomkin, The Observatory, April 2005) **Viewing the Constellations with Binoculars 250+ Wonderful Sky Objects to See and Explore** Springer Science & Business Media Viewing the Constellations with Binoculars is a complete guide to practical astronomy, written for beginners, intermediate-level astronomers, and even people who have not yet turned their gaze to the night sky. The required observing equipment to get the full value from this book is no more than a pair of regular 10 x 50 binoculars, but even more can be seen with a small astronomical telescope. This comprehensive introduction to astronomy and practical observing is far more than a guide to what can be seen in the night sky through binoculars. It introduces the reader to some basic (and some not-so-basic) astronomical concepts, and discusses the stars and their evolution, the planets, nebulae, and distant galaxies. There is a guide to selecting and using binoculars for astronomy, as well, as a 'getting ready to observe' section containing invaluable practical hints and tips. The second part of the book is an extraordinarily complete atlas and guide to the night sky down to 30o N (covering all the USA and Europe). It is illustrated with superb and sometimes beautiful amateur astronomical photographs, detailed maps (down to 5th magnitude), descriptions, and data on all astronomical objects of interest. **Telescopes and Techniques An Introduction to Practical Astronomy** Springer Science & Business Media The modern aspiring astronomer is faced with a bewil dering choice of commercially produced telescopes, including all the designs considered in the preceding chapter. Yet only four decades ago the choice for a small telescope would have been between just a refrac tor and a Newtonian reflector. That change has come about because of the enormous interest that has grown in astronomy since the start of the space age and with the mind-boggling discoveries of the past 30 or 40 years. Except for some of the very small instruments which are unfortunately often heavily promoted in general mail order catalogues, camera shops and the like, the optical quality of these commercially pro duced telescopes is almost uniformly excellent. Although one product may be slightly better for some types of observation, or more suited to the personal cir cumstances of the observer, than another, most of them will provide excellent observing opportunities. The same general praise cannot be applied, however, to the mountings with which many of these telescopes are provided, and those problems are covered in Chapter 6. **Astrophysics is Easy! An Introduction for the Amateur Astronomer** Springer Science & Business Media Astrophysics is often - with some justification - regarded as incomprehensible without at least degree-level mathematics. Consequently, many amateur astronomers skip the math, and miss out on the fascinating fundamentals of the subject. In Astrophysics Is Easy! Mike Inglis takes a quantitative approach to astrophysics that cuts through the incomprehensible mathematics, and explains the basics of astrophysics in accessible terms. The reader can view objects under discussion with commercial amateur equipment. **From Casual Stargazer to Amateur Astronomer How to Advance to the Next Level** Springer Science & Business Media The beginning astronomical observer passes through a series of stages. The initial stage is hugely exciting and gives the beginner a real buzz as he discovers some of the faint fuzzy objects, markings

on the planets, rings around Saturn and the craters on the Moon. But as the novice observer progresses, he or she wants to know what more there is than looking at faint fuzzy blobs or indistinct planet markings. Many jump to the conclusion – wrongly – that they need to spend lots of money on expensive equipment to progress. “From Casual Stargazer to Amateur Astronomer” has been written specifically to address this group of budding stargazers. Astronomy is much more than a quick sightseeing tour. Patient observers who can develop their skills will start to appreciate what they are seeing, and will know exactly what to look out for on any particular night. And equally important, they will learn what not to expect to see. “From Casual Stargazer to Amateur Astronomer” is for those who want to develop observing skills beyond mere sightseeing, and learn some of the techniques used to carry out enjoyable – and scientifically useful – observations. It will also direct readers to make informed choices about what can be seen and when. This book is for anyone keen to develop their skills as an amateur astronomer. **Visual Lunar and Planetary Astronomy** Springer Science & Business Media With the advent of CCDs and webcams, the focus of amateur astronomy has to some extent shifted from science to art. Visual work in astronomy has a rich history. Today, imaging is now more prominent. However there is still much for the visual amateur astronomer to do, and visual work is still a valid component of amateur astronomy. Paul Abel has been addressing this issue by promoting visual astronomy wherever possible – at talks to astronomical societies, in articles for popular science magazines, and on BBC TV’s The Sky at Night. Visual Lunar and Planetary Astronomy is a comprehensive modern treatment of visual lunar and planetary astronomy, showing that even in the age of space telescopes and interplanetary probes it is still possible to contribute scientifically with no more than a moderately-priced commercially made astronomical telescope. It is believed that imaging and photography is somehow more objective and more accurate than the eye, and this has led to a peculiar “crisis of faith” in the human visual system and its amazing processing power. But by analyzing observations from the past, we can see how accurate visual astronomy really is! Measuring the rotational period of Mars and making accurate lunar charts for American astronauts were all done by eye. The book includes sections on how the human visual system works, how to view an object through an eyepiece, and how to record observations and keep a scientific notebook. The book also looks at how to make an astronomical, rather than an artistic, drawing. Finally, everything here will also be of interest to those imagers who wish to make their images more scientifically applicable by combining the methods and practices of visual astronomy with imaging. **Getting Started in Radio Astronomy Beginner Projects for the Amateur** Springer Science & Business Media Radio astronomy is a mystery to the majority of amateur astronomers, yet it is the best subject to turn to when desirous of an expanded knowledge of the sky. This guide intends to instruct complete newcomers to radio astronomy, and provides help for the first steps on the road towards the study of this fascinating subject. In addition to a history of the science behind the pursuit, directions are included for four easy-to-build projects, based around long-term NASA and Stanford Solar Center projects. The first three projects constitute self-contained units available as kits, so there is no need to hunt around for parts. The fourth – more advanced – project encourages readers to do their own research and track down items. Getting Started in Radio Astronomy provides an overall introduction to listening in on the radio spectrum. With details of equipment that really works, a list of suppliers, lists of online help forums, and written by someone who has actually built and operated the tools described, this book contains everything the newcomer to radio astronomy needs to get going. **Astrophysics Is Easy! An Introduction for the Amateur Astronomer** Springer Astrophysics is often –with some justification – regarded as incomprehensible without the use of higher mathematics. Consequently, many amateur astronomers miss out on some of the most fascinating aspects of the subject. Astrophysics Is Easy! cuts through the difficult mathematics and explains the basics of astrophysics in accessible terms. Using nothing more than plain arithmetic and simple examples, the workings of the universe are outlined in a straightforward yet detailed and easy-to-grasp manner. The original edition of the book was written over eight years ago, and in that time, advances in observational astronomy have led to new and significant changes to the theories of astrophysics. The new theories will be reflected in both the new and expanded chapters. A unique aspect of this book is that, for each topic under discussion, an observing list is included so that observers can actually see for themselves the concepts presented –stars of the spectral sequence, nebulae, galaxies, even black holes. The observing list has been revised and brought up-to-date in the Second Edition. **Atlas of Uranus** Cambridge University Press Discusses the accomplishments of the Voyager space program, looks at the history of Uranus, and explains what we have learned about its rings and moons **Choosing and Using a Refracting Telescope** Springer Science & Business Media Choosing and Using a Refracting Telescope has been written for the many amateur astronomers who already own, or are intending to purchase, a refracting telescope – perhaps to complement their existing arsenal of larger reflecting telescopes – or for the specialist who requires a particular refractor for serious astronomical applications or nature studies. Four hundred year ago, during the winter of 1609, a relatively unknown Italian scientist, Galileo Galilei designed a spyglass with two crude lenses and turned it skyward. Since then, refractors have retained their dominance over all types of reflector in studies of the Moon, planets and double stars because of the precision of their optics and lack of a central obstruction in the optical path, which causes diffraction effects in all commercially-made reflectors. Most mature amateur astronomers got started with a 60mm refractor, or something similar. Thirty years ago, there was little choice available to the hobbyist, but in the last decade long focus crown-flint achromats have moved aside for some exquisitely crafted apochromatic designs offered by leading commercial manufacturers. There has been a huge increase in the popularity of these telescopes in the last few years, led by a significant increase in the number of companies (particularly, William Optics, Orion USA, StellarVue, SkyWatcher and AstroTech) who are now heavily marketing refractors in the amateur astronomical magazines. In Choosing and Using a Refracting Telescope, well-known observer and astronomy writer Neil English celebrates the remarkable history and evolution of the refracting telescope and looks in detail at the instruments, their development and their use. A major feature of this book is the way it compares not only different classes of refractor, but also telescopes of each class that are sold by various commercial manufacturers. The author is perhaps uniquely placed to do this, having used and tested literally hundreds of different refracting telescopes over three decades. Because it includes many diverse subjects such as imaging with consumer-level digital cameras, imaging with webcams, and imaging with astronomical CCD cameras – that are not covered together in equal depth in any other single volume – Choosing and Using a Refracting Telescope could become the ‘refractor bible’ for amateur astronomers at all levels, especially those who are interested in imaging astronomical objects of every class. **Meteor Showers An Annotated Catalog** Springer Science & Business Media Meteor showers are among the most spectacular celestial events that may be observed by the naked eye, and have been the object of fascination throughout human history. In “Meteor Showers: An Annotated Catalog,” the interested observer can access detailed research on over 100 annual and periodic meteor streams in order to capitalize on these majestic spectacles. Each meteor shower entry includes details of their discovery, important observations and orbits, and gives a full picture of duration, location in the sky, and expected hourly rates. Armed with a fuller understanding, the amateur observer can better view and appreciate the shower of their choice. The original book, published in 1988, has been updated with over 25 years of research in this new and improved edition. Almost every meteor shower study is expanded, with some original minor showers being dropped while new ones are added. The book also includes breakthroughs in the study of meteor showers, such as accurate predictions of outbursts as well as comet and meteor observations from the 6th century to the 17th century that were not published in the first edition. It holds all of the information needed to inspire a new observer or provide deeper knowledge to the long-time enthusiast. **A Practical Guide to Lightcurve Photometry and Analysis** Springer Tools for amateur astronomers who wish to go beyond CCD imaging and step into ‘serious’ science. The text offers techniques for gathering, analyzing, and publishing data, and describes joint projects in which amateurs and students can take part. Readers learn to recognize and avoid common errors in gathering photometry data, with detailed examples for analysis. Includes reviews of available software, with screen shots and useful tips. **Binocular Astronomy** Springer Science & Business Media This book contains everything an astronomer needs to know about binocular observing. The book takes an in-depth look at the instruments themselves. It has sections on evaluating and buying binoculars and binocular telescopes, their care, mounting, and accessories. In addition there is a selection of fifty fine objects to be seen with 50mm and 100mm binoculars. The advantages of using both eyes for astronomical observing are many and considerable, largely because of the way the human brain processes visual information. This book enables the astronomer to maximize those advantages. **Observing Comets** Springer Science & Business Media 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 there are so many amateurs looking for them, and techniques and instruments have improved dramatically in the past few years. After a short but detailed introduction to the comets themselves Nick James and Gerald North describe comet hunting, photographing and imaging comets, and digital image processing. The use of computers for orbital calculations and even helping to discover new comets is given a full chapter, as are advanced techniques including comet photometry and spectroscopy. This comprehensive book has an accompanying CD-ROM and is at once a "primer" for comet hunters and a reference text for more advanced amateur astronomers. **Astro-Imaging Projects for Amateur Astronomers A Maker’s Guide** Springer This is the must-have guide for all amateur astronomers who double as makers, doers, tinkerers, problem-solvers, and inventors. In a world where an amateur astronomy habit can easily run into the many thousands of dollars, it is still possible for practitioners to get high-quality results and equipment on a budget by utilizing DIY techniques. Surprisingly, it's not that hard to modify existing equipment to get new and improved usability from older or outdated technology, creating an end result that can outshine the pricey higher-end tools. All it takes is some elbow grease, a creative and open mind and the help of Chung's hard-won knowledge on building and modifying telescopes and cameras. With this book, it is possible for readers to improve their craft, making their equipment more user friendly. The tools are at hand, and the advice on how to do it is here. Readers will discover a comprehensive presentation of astronomical projects that any amateur on any budget can replicate – projects that utilize leading edge technology and techniques sure to invigorate the experts and elevate the less experienced. As the "maker" community continues to expand, it has wonderful things to offer amateur astronomers with a willingness to get their hands dirty. Tweaking observing and imaging equipment so that it serves a custom purpose can take your observing options to the next level, while being fun to boot. **Making Beautiful Deep-Sky Images Astrophotography with Affordable Equipment and Software** Springer Science & Business Media 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.