

# The Backyard Astronomer's Guide

by Terence Dickinson

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## Summary:

The Backyard Astronomer's Guide by Terence Dickinson is a comprehensive guide to the night sky. It provides detailed information on how to observe and understand the stars, planets, galaxies, comets, meteors and other celestial objects visible in the night sky. The book begins with an introduction to astronomy and its history. It then covers topics such as choosing a telescope or binoculars for observing; understanding star charts; finding constellations; identifying planets and deep-sky objects; photographing astronomical phenomena; using computers for astronomy research; exploring asteroids, comets and meteor showers; learning about space exploration missions past and present.

The book also includes chapters on astrophotography techniques such as long exposure photography of star trails or capturing images of distant galaxies through digital cameras. Additionally it contains sections on building your own observatory or constructing simple instruments like sundials or sextants for navigation purposes. Finally there are chapters devoted to understanding timekeeping systems used in astronomy including sidereal time, Julian dates and Greenwich Mean Time.

Throughout the book Dickinson provides helpful tips from experienced astronomers that will help readers get started in their backyard stargazing adventures. He also offers advice on how to join local amateur astronomer clubs where you can learn more about this fascinating hobby from others who share your passion.

## Main ideas:

**#1. Learn the Basics of Astronomy: Astronomy is a fascinating field of study that can be enjoyed by anyone with an interest in the night sky. The Backyard Astronomer's Guide provides an introduction to the basics of astronomy, including the constellations, planets, and other celestial objects.**

Astronomy is a fascinating field of study that can be enjoyed by anyone with an interest in the night sky. The Backyard Astronomer's Guide provides an introduction to the basics of astronomy, including the constellations, planets, and other celestial objects. This book covers topics such as how to identify stars and constellations, what equipment you need for backyard astronomy, and how to observe different types of astronomical phenomena. It also includes information on more advanced topics such as astrophotography and computer-aided observing.

The guide begins with a brief overview of basic concepts like light years and magnitudes before delving into details about specific celestial bodies. You'll learn about our solar system's planets—their orbits around the Sun, their physical characteristics—as well as comets, asteroids, galaxies beyond our own Milky Way galaxy, nebulae (clouds of gas), star clusters (groups of stars), double stars (two stars orbiting each other) and much more.

In addition to providing detailed descriptions of these various objects in space, this book also offers practical advice on how best to observe them from your own backyard or local observatory. It explains which telescopes are best suited for viewing certain kinds of astronomical phenomena; it describes techniques for taking photographs through a telescope; it even suggests ways you can use computers to enhance your observations.

**#2. Understand the Equipment: To get the most out of backyard astronomy, it is important to understand the different types of equipment available and how to use them. The Backyard Astronomer's Guide provides detailed information on telescopes, binoculars, and other tools of the trade.**

To get the most out of backyard astronomy, it is important to understand the different types of equipment available and how to use them. The Backyard Astronomer's Guide by Terence Dickinson provides detailed information on telescopes, binoculars, and other tools of the trade. Telescopes come in a variety of shapes and sizes with different features that can be used for viewing planets, stars, galaxies, nebulae and more. Binoculars are also useful for observing celestial objects but have less magnification than a telescope. Other pieces of equipment such as filters or tracking mounts can help enhance your experience.

The guide covers topics such as choosing the right type of telescope or binoculars for your needs; understanding how to set up and maintain your equipment; learning about eyepieces; using star charts; taking photographs through a telescope; exploring deep sky objects like galaxies and nebulae; finding comets; observing eclipses and much more.

By understanding all aspects of backyard astronomy from selecting the right gear to making observations you will be able to make the most out of every night under the stars.

**#3. *Identify Celestial Objects: The Backyard Astronomer's Guide provides detailed instructions on how to identify the various celestial objects visible in the night sky. It also includes information on how to use star charts and other tools to help locate and identify these objects.***

The Backyard Astronomer's Guide is an invaluable resource for amateur astronomers looking to identify celestial objects in the night sky. It provides detailed instructions on how to use star charts and other tools, such as binoculars or telescopes, to locate and identify these objects. The book also includes information about the various types of stars, galaxies, nebulae, planets and other astronomical phenomena that can be seen with the naked eye or through a telescope.

In addition to providing step-by-step instructions on how to find and observe different celestial bodies, The Backyard Astronomer's Guide also offers advice on choosing equipment for observing the night sky. It explains what type of telescope is best suited for viewing certain objects in detail and which accessories are necessary for successful stargazing sessions.

The guide also contains helpful tips on taking photographs of celestial bodies using digital cameras or specialized astrophotography equipment. With its comprehensive coverage of all aspects related to identifying celestial objects in the night sky, The Backyard Astronomer's Guide is an essential reference tool for any aspiring backyard astronomer.

**#4. *Learn About the Moon: The Backyard Astronomer's Guide provides an in-depth look at the Moon, including its phases, features, and how to observe it. It also includes information on how to use lunar maps and other tools to help identify features on the Moon's surface.***

The Backyard Astronomer's Guide provides an in-depth look at the Moon, giving readers a comprehensive understanding of its phases, features, and how to observe it. It covers topics such as the different types of lunar eclipses and how they occur; the various features on the Moon's surface including craters, mountains, valleys and seas; and tips for using lunar maps to identify these features. The book also includes information on observing techniques such as binocular astronomy or telescope viewing.

In addition to providing detailed information about the Moon itself, The Backyard Astronomer's Guide offers advice on choosing equipment for observing it. This includes selecting telescopes with appropriate magnification power for seeing details on the Moon's surface; finding out which filters are best suited for viewing certain objects; and learning about other accessories that can enhance your experience when looking at our nearest celestial neighbor.

Whether you're a beginner or experienced astronomer looking to learn more about our closest celestial companion, The Backyard Astronomer's Guide is an invaluable resource. With its comprehensive coverage of all aspects related to studying and observing the Moon, this book will help you gain a better appreciation of Earth's only natural satellite.

**#5. Observe the Planets: *The Backyard Astronomer's™s Guide* provides detailed information on how to observe the planets in our solar system. It includes information on how to identify the planets, their features, and how to use planetary maps to help locate them in the night sky.**

Observing the planets in our solar system can be a fascinating and rewarding experience. The Backyard Astronomer's Guide provides detailed information on how to observe the planets, including how to identify them, their features, and how to use planetary maps to help locate them in the night sky. With this guide, you will learn about each planet's unique characteristics and gain an appreciation for its beauty.

The book also covers topics such as telescope selection and setup, observing techniques for different types of objects (including galaxies), astrophotography basics, light pollution issues, and more. It is written with both novice astronomers and experienced observers in mind so that everyone can benefit from its contents.

Whether you are just starting out or have been observing for years, The Backyard Astronomer's Guide is an invaluable resource that will help you get the most out of your stargazing experiences. So grab your telescope or binoculars and start exploring!

**#6. Understand the Constellations: *The Backyard Astronomer's™s Guide* provides detailed information on the constellations, including how to identify them, their mythology, and how to use star charts to help locate them in the night sky.**

The Backyard Astronomer's Guide provides an in-depth look at the constellations, helping readers to understand them better. It explains how to identify each constellation and its associated mythology, as well as providing detailed star charts that can be used to locate them in the night sky. The book also includes information on seasonal changes in the sky, so readers can keep track of which constellations are visible throughout the year. With this comprehensive guide, backyard astronomers will have all they need to explore and appreciate these beautiful celestial formations.

In addition to providing a wealth of knowledge about individual constellations, The Backyard Astronomer's Guide also offers tips for observing them with binoculars or telescopes. Readers will learn how best to use their equipment for viewing stars and other objects in space such as galaxies and nebulae. This book is an invaluable resource for anyone interested in exploring astronomy from their own backyard.

**#7. Learn About Deep Sky Objects: *The Backyard Astronomer's™s Guide* provides detailed information on the various deep sky objects visible in the night sky, including galaxies, nebulae, and star clusters. It also includes information on how to use star charts and other tools to help locate and identify these objects.**

The Backyard Astronomer's Guide provides an in-depth look at the various deep sky objects visible in the night sky. It covers galaxies, nebulae, and star clusters, as well as how to use star charts and other tools to help locate them. The book also includes detailed information on each object's size, shape, brightness, distance from Earth, and more. Additionally, it offers tips for observing these objects with binoculars or a telescope.

The guide is written by Terence Dickinson who has been writing about astronomy since 1975. He has authored several books on astronomy including *Nightwatch: A Practical Guide to Viewing the Universe* and *Hubble Vision: Further Adventures with the Hubble Space Telescope*. His expertise makes this book an invaluable resource for amateur astronomers looking to explore deep space.

**#8. Understand the Seasons: *The Backyard Astronomer's™s Guide* provides detailed information on the different seasons of the year and how they affect the night sky. It includes information on how to use star charts and other tools to help identify the constellations and other celestial objects visible during each season.**

Understanding the seasons is an important part of being a backyard astronomer. The Backyard Astronomer's Guide provides detailed information on the different seasons of the year and how they affect the night sky. It explains how to

use star charts, binoculars, and other tools to help identify constellations and other celestial objects visible during each season. It also covers topics such as seasonal meteor showers, eclipses, comets, planets in our solar system, and more.

The book includes helpful diagrams that illustrate what stars are visible at certain times of year from various locations around the world. This makes it easy for readers to plan their stargazing sessions according to when certain astronomical events will be taking place or when particular constellations will be most prominent in their area.

In addition to providing useful information about astronomy basics like star magnitudes and angular sizes of celestial bodies, *The Backyard Astronomer's Guide* also offers tips on observing techniques such as using filters for viewing faint objects or tracking satellites with a telescope.

**#9. *Learn About Meteors and Meteor Showers: The Backyard Astronomer's Guide provides detailed information on meteors and meteor showers, including how to identify them, their origin, and how to observe them.***

Meteors and meteor showers are a fascinating part of the night sky, and *The Backyard Astronomer's Guide* provides an in-depth look at these phenomena. It explains how to identify meteors and meteor showers, their origin, and how to observe them. Readers will learn about the different types of meteors that can be seen from Earth, such as sporadic meteors or those associated with annual meteor showers like the Perseids or Leonids. They will also discover what causes these events – from comets entering our atmosphere to dust particles left behind by asteroids.

The book also covers topics such as where to find dark skies for optimal viewing conditions; when is the best time of year for observing; what equipment is needed; safety tips; and more. With its comprehensive information on all aspects of meteors and meteor showers, *The Backyard Astronomer's Guide* is an invaluable resource for anyone interested in learning more about this exciting area of astronomy.

**#10. *Understand the Sun: The Backyard Astronomer's Guide provides detailed information on the Sun, including its features, how to observe it, and how to use solar maps to help identify features on its surface.***

The Sun is the closest star to Earth and has been studied for centuries. *Understand the Sun: The Backyard Astronomer's Guide* provides an in-depth look at our nearest star, from its features to how to observe it. This book explains how solar maps can be used to identify features on the surface of the Sun, such as sunspots and prominences. It also covers topics like solar flares, coronal mass ejections, and other phenomena that occur on or near the Sun.

In addition to providing information about observing and understanding the Sun, this guide offers advice on selecting a telescope or binoculars for viewing it safely. It also includes tips on taking photographs of solar events with digital cameras or specialized equipment designed specifically for astrophotography. With detailed diagrams and illustrations throughout, readers will gain a better understanding of what they are seeing when they observe our nearest star.

Whether you are just starting out in astronomy or have been studying it for years, *Understand the Sun: The Backyard Astronomer's Guide* is an invaluable resource that will help you explore one of nature's most fascinating objects – the sun!

**#11. *Learn About the Solar System: The Backyard Astronomer's Guide provides detailed information on the planets and other objects in our solar system, including their features, how to observe them, and how to use planetary maps to help identify them in the night sky.***

*The Backyard Astronomer's Guide* provides an in-depth look at the planets and other objects that make up our solar system. Written by Terence Dickinson, this book is a comprehensive guide to understanding the features of each planet, how to observe them, and how to use planetary maps for identification in the night sky. It covers topics such as the structure of our solar system, its formation and evolution over time, and even includes information on comets and

asteroids.

This book also contains detailed descriptions of each planet's physical characteristics including size, mass, composition, atmosphere type (if any), surface features like mountains or craters; it also explains their orbital paths around the sun. Additionally, there are sections dedicated to observing techniques such as using binoculars or telescopes for viewing planets from Earth. The Backyard Astronomer's Guide is an invaluable resource for anyone interested in learning more about our solar system.

**#12. *Understand the Milky Way: The Backyard Astronomer's Guide provides detailed information on the Milky Way, including its structure, how to observe it, and how to use star charts to help identify its features.***

The Milky Way is a vast and complex structure, but with the right knowledge it can be explored in detail. The Backyard Astronomer's Guide provides an excellent introduction to this fascinating subject. It explains the structure of our galaxy, how to observe it from Earth, and how to use star charts to identify its features. With clear diagrams and detailed descriptions, readers will gain a better understanding of the Milky Way's many components.

The book also covers topics such as dark nebulae, supernovae remnants, globular clusters, open clusters and more. It includes tips on observing techniques for both binoculars and telescopes so that backyard astronomers can get the most out of their equipment. Additionally, there are sections devoted to photographing galaxies and other deep sky objects.

Whether you're just starting out or already have some experience in astronomy, The Backyard Astronomer's Guide is an invaluable resource for learning about our own galaxy - the Milky Way.

**#13. *Learn About the Universe: The Backyard Astronomer's Guide provides detailed information on the universe, including its structure, how to observe it, and how to use star charts to help identify its features.***

The Backyard Astronomer's Guide provides an in-depth look at the universe and its many wonders. Written by renowned astronomer Terence Dickinson, this book is a comprehensive guide to understanding the structure of the universe, how to observe it, and how to use star charts for identification. It covers topics such as galaxies, stars, planets, comets and asteroids; their formation and evolution; astronomical instruments; observing techniques; celestial navigation; timekeeping systems; constellations and deep sky objects.

This book also includes detailed information on telescopes "from simple binoculars to sophisticated computerized models" as well as advice on choosing one that best suits your needs. Additionally, The Backyard Astronomer's Guide contains helpful tips on taking photographs of celestial objects with digital cameras or film cameras.

Whether you are a beginner or experienced amateur astronomer looking for more knowledge about our fascinating universe, The Backyard Astronomer's Guide will provide you with all the necessary tools needed to explore space like never before!

**#14. *Understand the History of Astronomy: The Backyard Astronomer's Guide provides an overview of the history of astronomy, including the major figures and discoveries that have shaped our understanding of the universe.***

The history of astronomy is a long and fascinating one, stretching back to the earliest civilizations. From ancient Babylonian astronomers who charted the stars in the night sky to modern-day scientists using powerful telescopes to explore distant galaxies, humans have always been captivated by what lies beyond our planet. The Backyard Astronomer's Guide provides an overview of this rich history, exploring some of its most important figures and discoveries.

The book begins with a look at early astronomical observations made by cultures around the world. It then moves on to discuss how these observations were used for navigation and timekeeping before delving into more detailed topics such

as heliocentrism, Newton's laws of motion, and Einstein's theory of relativity. Alongside these scientific breakthroughs are stories about famous astronomers like Galileo Galilei, Johannes Kepler, Edmond Halley, William Herschel and Edwin Hubble.

In addition to providing an overview of astronomy's past achievements, The Backyard Astronomers Guide also offers practical advice on observing celestial objects from your own backyard. With tips on choosing equipment and techniques for viewing planets, stars clusters nebulae and other deep-sky objects it will help you get started in amateur astronomy.

**#15. *Learn About Astrophotography: The Backyard Astronomer's™ Guide provides detailed information on astrophotography, including how to use cameras and other equipment to capture images of the night sky.***

Astrophotography is a fascinating hobby that allows you to capture the beauty of the night sky. The Backyard Astronomer's Guide by Terence Dickinson provides detailed information on how to use cameras and other equipment to take stunning images of stars, galaxies, nebulae, and more. This book covers topics such as choosing the right camera for astrophotography, setting up your telescope or mount correctly for imaging, understanding exposure times and filters, post-processing techniques for enhancing your photos, and much more. With this guide in hand you will be able to create beautiful photographs of the night sky from your own backyard.

The Backyard Astronomer's Guide also includes tips on how to find interesting objects in the night sky with star charts and software programs like Stellarium. It also explains how to set up an observatory at home so that you can observe deep space objects without having to travel far away from home. Additionally it contains advice on taking care of your equipment so that it lasts longer.

Whether you are just starting out in astrophotography or have been doing it for years this book has something for everyone! With its comprehensive coverage of all aspects related to astrophotography The Backyard Astronomer's Guide is sure to become a valuable resource in any astronomers library.

**#16. *Understand the Different Types of Telescopes: The Backyard Astronomer's™ Guide provides detailed information on the different types of telescopes available, including their features, how to use them, and how to choose the right telescope for your needs.***

Telescopes come in a variety of shapes and sizes, each with its own unique features. From the small refractor telescope to the large Dobsonian reflector, there is something for everyone. Refractors are ideal for beginners because they are easy to use and require minimal maintenance. Reflectors offer more light gathering power than refractors but can be more difficult to operate due to their larger size and weight. Catadioptric telescopes combine both lenses and mirrors into one design that offers excellent performance at an affordable price.

When choosing a telescope, it's important to consider your budget as well as what type of observing you plan on doing. For example, if you want to observe faint deep-sky objects such as galaxies or nebulae then a larger aperture telescope will be necessary. On the other hand, if you plan on viewing planets or double stars then a smaller aperture scope may suffice.

It's also important to understand how different types of telescopes work so that you can make an informed decision when selecting one for yourself. The Backyard Astronomer's Guide provides detailed information on all aspects of astronomy including descriptions of various types of telescopes along with helpful tips on how best to use them.

**#17. *Learn About the Different Types of Binoculars: The Backyard Astronomer's™ Guide provides detailed information on the different types of binoculars available, including their features, how to use them, and how to choose the right binoculars for your needs.***

Binoculars are an essential tool for backyard astronomers, allowing them to observe the night sky in greater detail than with just their eyes. There are many different types of binoculars available, each designed for a specific purpose and

offering its own unique features. In *The Backyard Astronomer's Guide* by Terence Dickinson, readers can learn about the various types of binoculars and how to choose the right one for their needs.

The book covers topics such as optical design, magnification power, field of view, eye relief distance, exit pupil size and more. It also explains how to use binoculars correctly so that you get the most out of your viewing experience. Additionally, it provides advice on choosing between different brands and models based on factors like price range and intended use.

Whether you're looking for a pair of general-purpose astronomy binoculars or something more specialized like birding or hunting optics, *The Backyard Astronomer's Guide* has all the information you need to make an informed decision. With this comprehensive guide at your side, you can be sure that whatever type of binoculars you choose will help bring your stargazing dreams into focus.

**#18. *Understand the Different Types of Eyepieces: The Backyard Astronomer's Guide provides detailed information on the different types of eyepieces available, including their features, how to use them, and how to choose the right eyepiece for your needs.***

Eyepieces are an essential part of any telescope, and choosing the right eyepiece can make a huge difference in your viewing experience. There are several different types of eyepieces available, each with its own advantages and disadvantages. In *The Backyard Astronomer's Guide*, Terence Dickinson provides detailed information on the different types of eyepieces available, including their features, how to use them, and how to choose the right eyepiece for your needs.

The most common type of eyepiece is the Plössl design. This type offers good field-of-view (FOV) and eye relief at a reasonable price. It also has low distortion levels which makes it ideal for planetary observing. However, this type does not provide as much contrast or sharpness as other designs.

Another popular option is the Orthoscopic design which offers excellent contrast and sharpness but limited FOV due to its narrow apparent field size. This makes it better suited for lunar or planetary observing than widefield views such as star clusters or galaxies.

For those looking for maximum FOV without sacrificing too much image quality there are two options: Wide Field Eyepieces (WFE) or Super Wide Angle Eyepieces (SWA). WFE offer wider fields than standard Plössls while SWA offer even wider fields with improved edge performance compared to WFEs.

Finally there are specialty designs such as Barlow lenses that increase magnification by adding additional elements between the telescope's objective lens/mirror and the eyepiece itself; zoom lenses that allow you to adjust magnification without changing out your eyepiece; and binoviewers that let you view through two separate oculars simultaneously.

**#19. *Learn About the Different Types of Filters: The Backyard Astronomer's Guide provides detailed information on the different types of filters available, including their features, how to use them, and how to choose the right filter for your needs.***

Filters are an essential tool for backyard astronomers. They can help you observe faint objects, reduce glare from bright stars, and enhance the contrast of certain features in deep-sky objects. There are many different types of filters available to amateur astronomers, each with its own unique characteristics.

*The Backyard Astronomer's Guide* provides detailed information on the different types of filters available, including their features, how to use them, and how to choose the right filter for your needs. The book covers a wide range of topics related to filters such as light pollution reduction (LPR) filters; nebula and planetary filters; color correction (CC) or broadband (BB) filters; narrowband hydrogen alpha (Ha), oxygen III (OIII), and sulfur II (SII) emission line filters;

ultraviolet/infrared cut-off or UHC/CLC type "nebula" filters; polarizing moonlight suppression filter systems; solar projection screens and more.

In addition to providing detailed descriptions of each type of filter, The Backyard Astronomer's Guide also offers advice on selecting the best filter for your particular observing goals. It explains why some types may be better suited than others depending on what you want to observe—from galaxies and nebulae through star clusters down to planets—and it gives tips on how best to use them.

**#20. *Understand the Different Types of Mounts: The Backyard Astronomer's Guide provides detailed information on the different types of mounts available, including their features, how to use them, and how to choose the right mount for your needs.***

When it comes to choosing the right mount for your telescope, there are several different types available. The Backyard Astronomer's Guide provides detailed information on each type of mount and their features, so you can make an informed decision about which one is best suited for your needs.

Altazimuth mounts are the most common type of mount used by amateur astronomers. They provide a simple two-axis system that allows you to move the telescope up and down (altitude) or left and right (azimuth). This makes them ideal for viewing objects in both the northern and southern hemispheres.

Equatorial mounts use a more complex three-axis system that tracks celestial objects as they move across the sky due to Earth's rotation. This makes them better suited for astrophotography than altazimuth mounts, since they allow you to keep an object centered in your field of view while taking long exposures.

Dobsonian mounts are designed specifically for large Newtonian reflector telescopes. They feature a simple altazimuth design with smooth motions along both axes, making them easy to use even when observing faint deep sky objects.

Computerized GoTo mounts offer automated tracking capabilities using motors controlled by onboard computers. These systems can be programmed with coordinates from star charts or databases, allowing you to quickly locate any object in the night sky without having to manually adjust its position.