

WELCOME TO THE HAMILTON AMATEUR ASTRONOMERS



Hello and welcome to our astronomy club! The Hamilton Amateur Astronomers was established in 1993 as a non-profit club dedicated to promoting the enjoyment and advancement of astronomy. We offer our members many opportunities to learn about and share the night sky with others. It is our hope that this publication will provide you with an in-depth look at the many resources available through our club. Please feel free to contact us if you have any questions.

Ann Tekatch, Editor

It's my happy task to help introduce the hobby of Astronomy to you.

In this booklet you will be familiarized with some of the most important aspects of the hobby, but it's outside the booklet, in the club itself, where you will get your best start.

The club holds monthly meetings featuring distinguished speakers from the membership and from the astronomy community who bring you information about interesting topics and the latest research.

From time to time we organize outings to observatories, planetariums or other astronomy-related attractions.

We host public star parties at various locations and our members have access to and observe from two nearby dark sky sites.

Our website: www.amateurastronomy.org is second to none and offers information on everything from local weather conditions to blogs from our members about their observing experiences.

Our members have a vast wealth of knowledge about telescopes, the night sky, observing techniques, and shopping tips. And above all, we care about astronomy and will try to help you get the most from your equipment, experience and enthusiasm.

If you are thinking of buying astronomy equipment, I cannot stress enough that by far the best choice you will make in purchasing a telescope is to join an astronomy club first.

So, read on, and we will be here.

Steve Germann



Accessing the Club's Dark Sky Observing Site

Did you know that the HAA has a special agreement with the Binbrook Conservation Area that allows us to use the park after hours for astronomical observing? There are five HAA members who have keys to the main gate and are responsible for ensuring that park guidelines are followed while the park is being used by club members. They are Steve Germann, Don Pullen, Jim Wamsley, Joe McArdle and Ann Tekatch.

Observing sessions at the Binbrook Conservation Area are planned and scheduled for New Moon weekends throughout the year. These events are posted in our newsletter, Event Horizon, and periodically on our website. However, from time to time, other opportunities to observe will arise when conditions warrant a trip to the park. On these occasions, keyholders will send an email to all HAA members with details. These notices are necessarily of short notice (an hour or two before the observing session) and will contain information on when the observing session will begin and end and what the combination is for the lock at the main gate.

HAA members wishing to use the Binbrook Conservation Area at other times can contact the club's five keyholders by sending an email to:

keyholders@amateurastronomy.org

Keyholders are volunteers who frequently observe at the park. Please note that keys cannot be copied or loaned out. For those occasions when a keyholder isn't available, the alternate site on Tyneside Road is always open and does not require a keyholder.

Please remember that our access to the Binbrook Conservation Area (BCA) is a privilege, not a right. Club keyholders are responsible for ensuring that park guidelines are followed and any member using the park must respect their authority over all aspects of park use.

Let's hope for many clear skies this year so we can use the park to its fullest advantage!

Monthly Newsletter - Available Online

Our club newsletter, Event Horizon, is published electronically 10 times a year (September to June) and is available to members on the first of the month. The newsletter features colour photos taken by members; articles and information on upcoming events; reports on club activities and tips on making your own astronomy-related equipment.

We welcome submissions from all members! Contact Ann Tekatch: editor@amateurastronomy.org.

Special Interest Groups

Recognizing that many of our members are interested in different aspects of our hobby, we have formed groups that meet regularly to discuss the latest cosmological theories and astronomy-related books. Members who are interested in attending these discussion groups are encouraged to contact John Gauvreau (observing@amateurastronomy.org) for the Cosmology Discussion Group or Mario Carr (mariocarr@cogeco.ca) for the Astronomy Book Club Group.

Are you interested in Astro-Imaging? We host an annual Imaging Clinic. Watch the newsletter for details on when the next clinic is being held. Many of our members are excellent astro-imagers and we publish a calendar with their best images each year to raise money for the club. Our dark sky observing site offers excellent vistas for beginning and expert imagers.

Have you ever wondered how to make your own telescope? We have a small group of dedicated, mirror-grinding, amateur telescope makers who meet regularly to learn from each other. Contact Ann Tekatch (editor@amateurastronomy.org) for details on the next meeting.

Navigating the Night Sky by Andrew Bruce

Astronomy is a very rewarding activity, offering a lifetime of fun, educational and often challenging perspectives on the universe. If you are reading this article, then you may likely own or are considering acquiring a telescope or a pair of binoculars in order to reach deeper into our cosmos to see some of the Universe's most beautiful and thought provoking structures and "anatomy". So, you're under a beautiful night sky, the Milky Way spans across the sky from horizon to horizon, and the stars are so intense, they almost seem to cast a shadow. You've got your brand new telescope all set up and ready to go, but where to point it? Locating objects in the sky can be as frustrating as it is fun. It takes a lot of patience, some good star charts, and a lot of time under dark skies. Some of today's telescopes have a feature built in to them called "Go-To" which essentially finds the different objects for you by simply punching in the name of the object and hitting "Enter". Using computer controlled motors (and in some cases, even GPS), these Go-To Scopes swing around and point out your object with surprisingly good accuracy. However,



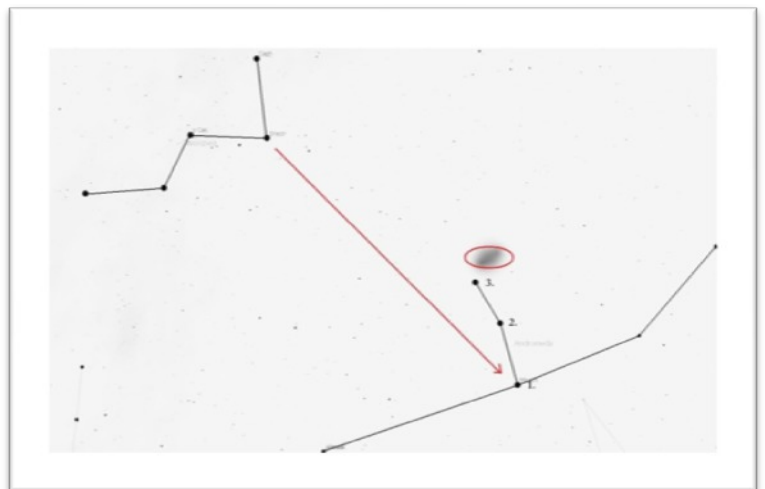
even Go-To Scopes require a basic knowledge of the night sky in order to properly initialize them. Many astronomers enjoy the "challenge of the hunt". Pooh-poohing Go-To scopes, many take a "purist" approach to locating night sky objects, and rely on fundamental night sky navigation skills to locate objects. Navigating the night sky is very much like navigating here on earth. Both require maps, compass, use of landmarks (or "spacemarks" if you will), coordinate systems, and yes, even GPS. The first thing you need to do is acquire a good map or "Star Chart" as they are commonly referred to in astronomy. These can easily be found on the internet, in most astronomy magazines and many astronomy books. I highly recommend the charts in "Night Watch" by Terrence Dickenson; they are very easy to read and are grouped by constellation and by season for year round use. You also need to be able to properly orient yourself. This is essential when using star charts. If you aren't familiar with the directions at your observing site, bring an inexpensive compass to help you get your bearings.



Anyone who has ever used a map and compass knows about Latitude and Longitude. Well, in the night sky there is a similar "coordinate" system used, known as Declination (Dec) and Right Ascension (R.A.). Many telescope mounts are setup to use this coordinate system to navigate the night sky, but for anyone just starting out, don't worry about it, it's not important when you are just beginning.



So you've properly oriented yourself, you've identified and located the constellations, and now you want to locate a deep sky object such as a nebula or galaxy. This is when things get a little tougher. You won't likely be able to see the object you are looking for with your naked eye. Using a star chart, you can roughly determine the part of the sky your object is in, but you are now going to have to use something called "star-hopping" in order to pinpoint your object so you can view it through your scope. Star-Hopping is just like it sounds; Starting with a known star, using your star chart, and essentially jumping from one bright star to another, while following along in your chart. For example, to find M31 (The Andromeda Galaxy), you need to first locate the constellation Cassiopeia. This is a very easy Constellation to find as it looks like a "W". Find the bottom right star of the "W", and this will be your starting point. Picture this star as the apex of an arrow. Follow the direction of this arrow until you come to



Navigating the Night Sky (continued)

the first relatively bright star. From there, you will see two more stars above the first one. Star hop from the first star, to the second star, stopping on the third. Now looking at your star chart, you'll notice that M31 is just above and to the right of that third star. Orient your scope to that spot, and you should have no problem finding it.

There is no right or wrong way to star-hop, it's whatever works best for you. So next time you are out under a crisp clear sky, try some of these techniques and practice using a star chart. There's a lot of space to explore, and a lifetime of things to find and observe, and who knows...maybe someday you'll find something yet to be discovered!

Clear Skies!

Telescopes?! We don't Need No Stinkin' Telescopes!

by Ann Tekatch

With apologies to B. Traven (*The Treasure of the Sierra Madre*, 1927), it's true that you don't need a telescope to observe the night sky. The naked eye served humanity well for millennia and continues to give us the best view of meteor showers, auroral displays, the Milky Way and planetary conjunctions - just to name a few celestial treats.

Next to your own two eyes, an ordinary pair of binoculars can provide a lifetime's worth of astronomical discovery. You can explore the maria, craters and highlands of the moon easily through binoculars. Or follow the dance of the Galilean moons as they orbit Jupiter. Almost half of the 110 Messier Objects (a listing of the brighter galaxies, nebulae and star clusters) are visible through binoculars. Many asterisms (patterns of stars - smaller than constellations) are viewed best through the low power, wide field of binoculars.

Although any pair of binoculars will do, we usually recommend those with apertures of 40-50mm. (The aperture of binoculars is the second number in their description. For example, 7x50 binoculars have a magnification of 7 times and an aperture of 50mm.) The larger diameter of the lenses in these binoculars will gather more light and allow you to see fainter objects. Larger binoculars offer even more light-gathering ability but are heavier and not as easily held for long periods of time. Likewise, magnifications greater than 10x are less useful because it is difficult to hold them steady enough for viewing.



There are many books on binocular observing available. I recommend Sky Publishing's *Binocular Highlights*. It provides background information and star charts for 99 objects visible through binoculars.

Another advantage to binoculars is that they can be used for other purposes such as birdwatching or sporting events. They take up very little room and you may already own a pair.

So why not forget about the telescope and head outside with a lawn chair and a pair of binoculars?

Buying Your First Telescope by Ann Tekatch

The best advice we can give you about buying your first telescope is NOT to buy a telescope. At least, not until you've had a chance to observe through many different telescopes and can decide which suits you best. The easiest way you can do this is to attend one (or several!) of our observing sessions and spend some time looking through the various telescopes owned by our members. Speak to the telescope owners and ask them what they like and dislike about their telescopes. Another good question to ask is what the telescope is primarily used for. Some of us like to take astro-photos. Others are interested in observing the faintest of galaxies or studying the clouds on Jupiter or estimating changes in the brightness of stars. What interests you will determine which type and size of telescope you should buy.

Before we discuss telescopes, let's take a moment to discuss eyepieces. Eyepieces are the removable lenses that go into a telescope's focuser and allow you to view objects. Their focal length is what determines the magnification of a telescope. To determine magnification, simply divide the telescope's focal length by the eyepiece's focal length (which is usually written on the eyepiece). We change magnification by changing eyepieces. The longer the focal length of the eyepiece, the less the magnification and vice versa. Stay away from telescopes that use eyepieces with barrel diameters of .965 inches. Today's better quality telescopes all use eyepieces of 1.25 inches and/or 2 inches in diameter. Just as there are different types of telescopes, so, too, are there different designs of eyepieces. That is a topic all in itself and beyond the scope of this article, so I'm going to recommend that you stick with Plossl eyepieces for your first telescope.

In today's market, there are many fine telescopes to choose from and an increasing number of designs. We will examine the three main types of telescopes used by amateur astronomers: refractors, Newtonian reflectors and Schmidt-Cassegrain telescopes.

Refractors

Refractors are the telescopes most people are familiar with. They consist of a metal tube with a lens at one end and an eyepiece at the other. A well made refractor will offer superb views of the moon and planets. The longer the telescope is, the more focal length (and magnification) it will provide. Refractors do not normally require collimating. (Simply put, collimating is the act of adjusting all of a telescope's optical surfaces so that they are properly lined up to one another.) Refractors are the "purest" form of telescope but rarely exceed 5 or 6 inches in aperture. This means that they aren't the best choice for hunting faint objects. John Gauvreau, our observing director, owns a small refractor and has this to share about it:



Above: John and his "small but mighty" refractor

"Although I have owned many fine telescopes over the years, my current favourite is a small refractor. These days there are many refractors available in the range of 80 to 90mm that are of excellent quality and reasonably priced.

Of course, the bigger the lens or mirror in a telescope, the more it will see (something that is often expressed, with both clarity and brevity, as "aperture rules"), so why would I want a small telescope? There are two reasons, and the first is obvious; it's small. That means that it's lightweight and easy to carry. When a large Dobsonian can fill the backseat of a car, or a Schmidt-Cassegrain can strain your back with its weight, the small refractor packs into something not much bigger than a briefcase, and can be carried with one hand.

But for me the best thing about a small refractor is that there is one thing that it can show you that a big telescope can't, and that is widefield views. A small telescope at low magnification can show sweeping, star filled vistas of the Milky Way, encompass the entire Pleiades or Andromeda Galaxy, and, while a large telescope will show you great views of the Lagoon or the Trifid Nebula, a small refractor will show you both at the same time! And by

Continued next page

Buying Your First Telescope (continued)

ensuring that you choose a telescope of good quality, it will also give high magnification views of the planets and other celestial wonders.

To me, my small refractor is the scope that does it all!"

Newtonian Reflectors

Newtonian reflecting telescopes use mirrors to gather light instead of lenses. The larger the mirror, the more light gathered. Large diameter reflecting telescopes can show fainter objects than their smaller siblings.

You will often hear some Newtonian reflectors referred to as "Dobs" or Dobsonian telescopes. These are named after the man, John Dobson, who invented the simple mount that many of today's Newtonian reflectors use. The simple up-down, side to side mount allows very large reflectors to be built easily and cheaply. Some custom-made Dobs can reach 50" in diameter! Most commercially available Dobs are in the range of 6-16 inches in diameter.



I have two Dobs - one is a commercial 6" Skywatcher and the other is a homemade 8" truss -tube style. I am very fond of the simplicity of a Dobsonian mounted Newtonian reflector. The telescope has two parts - mount and optical tube. It travels easily in our small car and takes less than one minute for me to put together, pop in an eyepiece and begin observing. I rarely have problems with the optics dewing or frosting over because the main mirror is at the bottom of the telescope tube which acts as a natural dewshield. Dobs are also easy to make and very cheap to buy. My 6" Skywatcher was purchased in 2009 at KW Telescope for \$299 CDN + tax. It came with two eyepieces and a finderscope. The optics are superb. It maintains its collimation for long periods of time and the eyepiece is at a very convenient height for children to view or for me to view while seated. Although I can't use my Dobs for astrophotography, they offer outstanding views of the planets, the moon, all of the Messier Objects as well as many other deep sky objects (galaxies, nebulae, star clusters). I use them for doing variable star brightness estimates and public sky tours. They suit my observing style.

(Left: Skye Hepburn demonstrating Ann's 6" Skywatcher Dob. Cropped from a photo by Kerry-Anne Lecky-Hepburn)

Schmidt-Cassegrain Telescopes

Schmidt -Cassegrain Telescopes (abbreviated SCT) are compound telescopes using mirrors as well as a correcting lens at the front. They offer long focal lengths in short tubes as well as decent apertures at reasonable costs. They are the choice of many beginning astrophotographers because they combine driven, computerized GOTO mounts with decent optics and better light-gathering ability than similarly-priced but smaller refractors. Some form of dew prevention is a necessity with Schmidt-Cassegrain telescopes because their front corrector plate is exposed to the night sky and fogs over as soon as the temperature drops to the dewpoint.

Jim Wamsley has a SCT. He has this to say about his reasons for choosing the design:

"One of the main reasons I chose a S.C. scope is the travel of the eye piece. The travel from highest point to lowest point is rarely more than 8". On a Dobsonian Newtonian scope, the eyepiece will be close to the ground when viewing close to the horizon, and you may need a ladder when at zenith (depending on the size of scope). The same problem can occur with a large refractor. I have seen some people having to lie on the ground to view an object close to zenith, and barely able to reach the eyepiece at the horizon. This may not sound like a big thing to

Continued next page

Buying Your First Telescope (continued)



some, but if you have had a knee replacement, or have a bad back, this could make the difference between an enjoyable time out observing, and an uncomfortable nightmare."

(Left: Jim and his Schmidt-Cassegrain telescope are a familiar sight at our public astronomy events.)

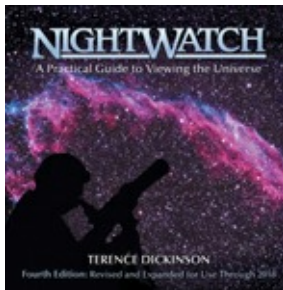
As you can see, the choice of a telescope is based on many personal priorities and preferences. Budget can also be a limiting, but not insurmountable, factor. We can offer advice on the best sources for equipment from our personal experiences.

Whichever telescope you decide to purchase, I wish you many happy hours under dark, clear skies with it. Join us at our next observing session and share the universe with friends!

Sky & Telescope Magazine Discount

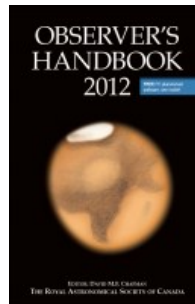
Members of the Hamilton Amateur Astronomers are entitled to a discounted subscription rate for Sky & Telescope Magazine. The annual (12 issues), discounted rate is \$39.95 US funds. See Ann Tekatch (editor@amateurastronomy.org) to find out how to sign up.

Recommended Astronomy Books by Ann Tekatch

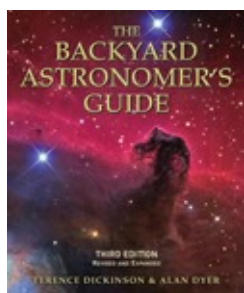


Nightwatch by Terry Dickenson is the best beginner's astronomy book on the market. Look for the fourth edition at your favourite bookstore or the public library. Aside from the beautiful photos, it contains excellent advice for getting started in amateur astronomy as well as some decent star charts to help you

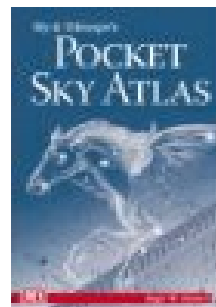
locate the constellations and brighter objects in the sky.



The Royal Astronomical Society of Canada publishes their Observer's Handbook annually. The Handbook contains a huge amount of data for the year's astronomical events as well as very useful information on equipment. There are chapters on each of the planets, the moon and the sun. It truly is an amateur astronomer's bible. It can be purchased directly from the RASC : www.rasc.ca.



The Backyard Astronomer's Guide by Terry Dickenson and Alan Dyer is another excellent astronomy book. It is the next step up from Nightwatch and includes solid background information on astro-imaging and the latest telescopes and accessories. It has recently been updated and revised for 2010.



Sky Publishing's Pocket Sky Atlas contains wonderfully detailed star charts that can be used with amateur telescopes. The charts are organized in a conveniently-sized format that fits easily in a glove compartment. You can order it online from Chapters or Amazon to take advantage of these booksellers' online discounted prices.

Contact Information

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Contact Us

Hamilton Amateur Astronomers
PO Box 65578
Dundas, ON
L9H 6Y6
www.amateurastronomy.org

General Inquiries:

secretary@amateurastronomy.org

Membership:

membership@amateurastronomy.org

Meeting Inquiries:

chair@amateurastronomy.org

Public Events:

publicity@amateurastronomy.org

Observing Inquiries:

observing@amateurastronomy.org

Newsletter:

editor@amateurastronomy.org

Phone:

Jim Wamsley 905-627-4323
Ann Tekatch 905-575-5433

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info@limelyte.com

**HAMILTON
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Observing site for the HAA provided with the generous
support of the

Binbrook Conservation Area

Come observing with the HAA and see what a great
location this is for stargazing, a family day or an out-
door function.

Please consider purchasing a season's pass for \$79 to
help support the park.

<http://www.npca.ca/conservation-areas/binbrook/>

Hamilton Amateur Astronomers Membership Application

Name:	
Address:	
City:	
Postal Code:	
Phone #:	
E-mail address:	
Type of Member-ship:	<p style="text-align: center;"> Individual (\$25 Cdn/year) Family (\$30 Cdn/year) Royal (\$50 Cdn/year)* Friend (\$100 Cdn/year)* Patron (\$250 Cdn/year)* Voluntary Donation \$ </p> <p> <small>* These levels of membership confer the same rights and privileges as a Family membership. We greatly appreciate the additional financial support our members provide by signing up as a Royal, Friend or Patron. Membership year is November 1 to October 31.</small> </p> <p> <small>Membership dues received after July 1 are applied to the upcoming year.</small> </p> <p> <small>The HAA is a registered, non-profit charitable organization (BN 8916 46267 RR0001). Donations over \$15 and membership fees are eligible for tax receipts upon request.</small> </p>
Total: \$	

Please make cheque payable to:

Hamilton Amateur Astronomers
P.O. Box 65578
Dundas, Ontario L9H 6Y6
CANADA