

# *Astronomy as a Hobby*

TCAA Guide #3

Carl J. Wenning



# ***ASTRONOMY AS A HOBBY***

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### **ABOUT THIS GUIDE:**

This *Astronomy as a Hobby* guide – the third of several such TCAA guides – was created after several years of thinking about why people who join astronomy clubs often don't transition to becoming lifelong members. Many, perhaps most, pay their dues intending to become involved, but something happens, and after a short while, they are no longer members. Why this happens remains a mystery for most astronomy clubs, but especially for the TCAA, where we have good members, a stable organization, outstanding resources, an excellent observing site, a substantial web presence, an award-winning newsletter, membership brochures, regular publicity, and frequent public outreach. We have recently increased the amount of member education to promote member development from novice to intermediate observer. Despite these facts, membership in the TCAA has been roughly stable at around 40-50 members since the start of the club in 1960.

Why should the failure to “transition” from novice to at least intermediate observer be so common in astronomy clubs in general and the TCAA in particular? There appear to be two contributing causes: (1) people in today's frenetic society no longer understand the concept of a hobby, and (2) many people feel out of place when it comes to seeking and finding the necessary help to make the transition. This guide, TCAA Guide #3, has been created in response to the former impediment. Guide # 2 – *Membership & Benefits* – addresses the last obstacle.

This guide serves as an introduction to hobbies in general and astronomy as a hobby in particular. It starts with a broad definition and characterization of a hobby. It continues with a review of what benefits accrue to one who has astronomy as a hobby. It continues with why the author observes the heavens and what he gets from doing so. It then takes an objective look at the hobby of amateur astronomy as it touches upon the problems that people have in becoming and remaining amateur astronomers. It concludes with a dozen things to do as you progress from neophyte to advanced amateur astronomer.

The author gratefully acknowledges the assistance of the following TCAA members who either provided guidance or conducted an editorial review: David Meyer and Mark Heiniger.

### **ABOUT THE AUTHOR:**

Dr. Carl J. Wenning is a well-known Central Illinois astronomy educator. He started viewing the heavens with the aid of his grandfather in the summer of 1957. Since then, Carl has continued viewing the night sky for six decades. He holds a B.S. degree in Astronomy from The Ohio State University, an M.A.T. degree in Planetarium Education from Michigan State University, and an Ed.D. degree in Curriculum & Instruction with a specialization in physics teaching from Illinois State University.

Dr. Wenning was planetarium director at Illinois State University from 1978 to 2001. From 1994-2008 he worked as a physics teacher educator. Retiring in 2008, he continued to teach physics and physics education courses for an additional fourteen years. He also continuously taught astronomy and physics lab science at Illinois Wesleyan University from 1982 to 2001. He fully retired from Illinois State University in 2022 after over 40 years of university-level teaching.

Carl became associated with the TCAA in September 1978 – shortly after he was hired to work at Illinois State University. Today he is an Astronomical League Master Observer (having completed 14 observing programs to date) and received the 2007 NCRAL Region Award for his contributions to amateur astronomy. He is a lifelong honorary member of the TCAA and also a member of its G. Weldon Schuette Society of Outstanding Amateur Astronomers.

The author has been actively involved in the Astronomical League and its North Central Region. He served on the national council and as Chair of the North Central Region (NCRAL) from 2017-2023. He has also served as NCRAL's ***Northern Lights*** newsletter editor since 2016. He won the League's coveted Mabel Sterns Award in 2017 for editing the TCAA's newsletter, ***The OBSERVER***, for many years.

## A WORD ABOUT HOBBIES

**The Benefits of a Hobby** – In days of old, hobbies were often handed down from parents to their children. Today, most of us do not know or seem to have forgotten what it means to have a hobby. We are so engaged in television, social media, gaming, web browsing, and email that hobbies have almost disappeared as we once knew them.

It's common today to see families gathered around a restaurant table, each working on a cell phone or tablet. This lack of face-to-face communication comes at a price. Youngsters, in particular, become socially isolated. They do not learn to engender and develop meaningful relationships with others. Engagement in hobbies that involve others is one way to break down this all-too-common problem. Involvement with hobbies helps the young to learn the interpersonal skills necessary to navigate the adult world. Kids engaged deeply in hobbies – especially those involving parents and other adults – learn the social skills essential to riding out the storms of life. They somehow always seem to become productive and socially responsible adults.

A hobby is a regular activity in one's leisure time for pleasure. Hobbies, if they are genuinely hobbies and not merely passing interests, are time-consuming and can often require considerable expenditures. Still, the benefits of having a hobby are numerous:

- **Hobbies provide a sense of leisure.** They allow us to take a break from our humdrum daily existence. They give a break with a purpose. They provide fun and fulfillment and can help one live life with a purpose.
- **Hobbies provide a sense of passion.** Passion goes hand in hand with happiness and satisfaction. Without a passion, any happiness is only temporary because there's nothing to make it last.
- **Hobbies can be very motivational.** They provide a positive type of stress that excites one about what one is doing and about life. They give a sense of excitement and joy.
- **Hobbies offer new challenges.** These challenges break up one's day-to-day routine and are quite positive in that they allow one to challenge one to become a better person – all that one can hope to be. They offer us new ways of seeing and experiencing the world.
- **Hobbies unite you with others.** Hobbies bring together those who have the same or at least similar interests. Hobbies help make life more fulfilling and keep one's friendships growing.
- **Hobbies are great stress reducers.** Adding things one doesn't want to do to a "to-do" list is stressful. Adding items to such a list that one likes today can help alleviate day-to-day stressors by giving a break from them. When working on hobbies, you have time to focus on things you want, which can be a great stress reducer.
- **Hobbies provide health benefits.** Engaging with hobbies is associated with better states of mind and helps to lower levels of loneliness and depression. Experiencing enjoyable activities is associated with lower blood pressure and total cortisol. Hobbies are great for both mind and body.
- **Hobbies assist with character development.** When people interact with their peers, they learn social skills that tend to build one's character and sense of self-confidence. Also, those with hobbies tend to have improved confidence and self-esteem.

**The Benefits of Engaging Youth in a Hobby** – What do parents who engage their children in hobbies know that others do not? There are substantial benefits of engaging youth in a hobby – not the least of which is growth in virtues. This frequently accounts for why certain children become successful adults, whereas others are considerably less so. There are many cases in the history of the TCAA where engaged youth have gone on to lead highly successful lives thanks to the virtues they picked up by participating in this club.

William J. Bennett, in the preface to *A Book of Virtues*, notes, "Moral education – the training of the heart and mind toward good – involves many things. It involves rules and precepts – the dos and don'ts of life with others – as well as explicit instruction, exhortation, and training. Moral education must provide training in good habits. Aristotle wrote that good habits make all the difference. Moral education, he noted, must affirm the central importance of moral examples. It has been said that nothing is more important, more influential, more determining of a child's life than the moral power of a quiet example. For children to take morality seriously, they must be in the presence of adults who take morality seriously, and with their own eyes, they must see adults take that morality seriously. This helps children to see what virtues look like in practice, how to recognize them, and how they work. Most Americans value honesty, compassion, courage, and perseverance. These are virtues, but because children are not born with the knowledge, they need to learn what virtues are."

As a former homeschooling parent with a dozen years of experience, I can tell you how crucial it is for children to interact with and be influenced by adults. Great benefits arise from doing so. While our two daughters did spend less time with other kids than "normal," they did so because of spending more time with adults than "normal." Over the years, many non-homeschooling parents chided my wife and me for the "lack of socialization" they perceived resulted from homeschooling. My typical response was, "We're trying to raise adults here, not kids." Think about this statement for a moment.

Kids won't learn moral virtues from those who don't yet possess them. It's much like the blind leading the blind; they both fall into the ditch. Only when kids spend time with virtuous adults do they learn these virtues in addition to knowledge and skills. Our club membership provides many virtuous examples of commitment, dedication, loyalty, seriousness of purpose, generosity, altruism, and self-control.

Children who spend time with adults can avoid much of the frivolity and negativity that often comes from spending time with their peers, such as emotional abuse, mistrust, feelings of guilt and inferiority, role confusion, isolation, discrimination, despair...

In addition to growing in virtue, children who spend time with adults tend to mature much more quickly. They interact regularly with adults and learn to think, speak, and act like adults. They have no other choice. Lack of maturity is one of the leading causes of children making poor decisions and getting into trouble with sometimes life-long consequences. Growth in personal maturity is one way to reduce if not altogether prevent, such. Involvement with one or more parents in a hobby and an associated club are great ways to enhance the chances for success in life.

I am not suggesting that youth should not socialize with other youth. There are many goods associated with doing so. For example, learning social and emotional coping skills, having the freedom to discover and explore personal interests, learning appropriate behavior by experiencing cause and effect in relationships, learning teamwork, having fun, and much more. Still, more time with adults and more time with children can be a good thing. Remember Aristotle's famous dictum, "Virtue lay in the middle way" – a midpoint between extremes.

Because this club's leadership sees the importance of involving youth in amateur astronomy, it hosts or participates in family-friendly events throughout the year, such as our public observing sessions, Family Science Day, and the *Universe Sampler* course. Also, during the February Annual Meeting, the club often confers the *Eugene and Donna Miller Family Award* in recognition of parents (or grandparents) who have worked diligently with one or more of their (grand)children. This is done to highlight the importance of engaging youth with the hobby of amateur astronomy via participation in the TCAA.

Perhaps if parents were more interested in raising adults than children, more of them would spend time with their children training them in the virtues – both directly by discussion and indirectly through example. Two ways of doing so are by engaging kids in a hobby and joining a club. These provide an "excuse" and resources for parents to spend quality time with their kids.

Do you know any parents with children who might benefit by pursuing the hobby of amateur astronomy and being affiliated with our club? Ask them to join us.

## WHY I OBSERVE THE HEAVENS

The Greek philosopher Plato is credited with saying, "An unexamined life is not worth living." One of my great passions in life is amateur astronomy. I recently asked myself, "Why do I observe the heavens?" It's good to have an answer to this question, as up to this point in time; I have been doing it for more than 50 years. Please bear with me as I wax philosophical about why I observe the heavens. Perhaps you will find here one or more reasons for doing the same.

What do I mean by the term 'observe'? It involves using one's eyes, binoculars, or a telescope to look at – not merely see – celestial objects. Visual observing is not the act of casual viewing; it consists of looking with intent – intent on seeing the dimmest parts, the faintest colors, the finest details, and any changes in a celestial object. Here are a few reasons why I observe the objects of the heavens above:

- **I am curious about the whole of the natural world.** Humans are curious about their place in the universe, not just the animals, plants, and rocks surrounding them. Unfortunately, most people today live in towns and cities surrounded by a landscape that physically blocks the sky from view. At night, cities have a constant electric glow that blocks the night sky

from view. Many of us have isolated ourselves from the environment for matters of convenience. We tend to hide away in our houses. If it is too hot, we turn on the air conditioner; if it is too cold, we turn on the heat; if it is too dark, we turn on the lights. Most of our lives seemingly are disconnected from the natural world.

- **I see my relationship with the rest of the universe.** Perspectives change when people realize that some 7.3 billion strong people occupy a tiny blue marble orbiting in the “Goldilocks zone” – not too hot and cold – not far from an ordinary star in the vast hostile place we call space. We seem to have a primal need to understand our relationship with the rest of the universe, and this understanding has implications.
- **I am continually amazed when I see a dark night sky.** It is not uncommon to hear people who have returned from a camping trip under a dark sky at a remote park to speak with awe, “The stars seemed much nearer to Earth.” As a result of this cosmic wonder, astronomy programs have proven to be wildly popular in state and national parks. For some, a dark night experience leads to a lifelong memory. For some, this fascination never dies. Considering the fantastic beauty of the universe surrounding us, it's easy to see why.
- **I appreciate what I see when looking through a telescope.** One look at the sunken craters of the moon, the glistening rings of Saturn, the sparkling stars of a cluster, the wispy tendrils of a nebula, the faint glow of a distant galaxy, and it's all oohs and ahs. No one unfamiliar with the wonders of the cosmos can walk away, not being impressed. Not only do I appreciate the views, but I also appreciate knowing enough about the rest of the universe that I can share it with others.

These reasons for observing the heavens naturally lead to the question about what to observe. Here are my thoughts about what I observe...

- **Solar system objects.** Solar system objects are, for many, among the most exciting things in the sky – the rings of Saturn, the moons of Jupiter, the crescent of Venus, red Mars, the sun and moon, eclipses, asteroids, and comets. Most can be observed in considerable detail because they are so close to us. These objects are ever-changing, captivating, and inspirational for everyone who views them – no matter how often they are viewed. Anyone who has ever noticed what people say during public observing sessions knows how these sights impact first-time viewers.
- **Deep space objects.** The sky beyond the solar system is filled with many objects, such as galaxies, clusters, and nebulae, as types and subtypes share a certain commonality. As one person once said to me, “Why look at that all those galaxies? They all look the same anyway; they're just faint blobs of light.” To some extent, the question and comments are not without merit, and they should be answered. Here is how I tend to respond...

First, they are all different. Each varies significantly from the other. For instance, M51 (the Whirlpool Galaxy) looks nothing like M31 (the Andromeda Galaxy). One has perceptible spiral arms, and the other has dust lanes. They differ in size and brightness and the degree of central condensation. They have different numbers and types of companion galaxies. Even the tiny ‘faint fuzzies’ differ from one another. Some are quiescent, while others are exploding; some even have massive black holes at their centers; others have hyper-luminous centers. Some galaxies appear circular, others appear elongated, and others are needle-like. They all come in different brightness and sizes. Their distances also vary considerably. As a result, we see things that are millions or tens of millions of years different in age due to the phenomenon of lookback time. When one knows what one is looking for, one can't help but be amazed.

It is essential to realize that we must also see with the mind's eye. This provides a means of non-verbal communication with the universe. While one can see an object – even observe an object – one doesn't appreciate it until one grasps the immensity of what the eye beholds. That is the role the mind plays in observation. We should always know something about the things we observe.

Second, it is only after viewing many galactic “smudges” that one begins to grasp the enormity of space and our place within it. Only after completing the Herschel 400 and Herschel II programs (most of whose objects are faint galaxies) did I realize how alone we appear to be in the universe. I now have a much fuller appreciation of the fact that we are minuscule and live on a dust mote that orbits an ordinary star that is part of an average galaxy nearly lost in the immensity of space. I have come to the startling realization that we are almost totally alone in the universe and that viewing the universe through the eyepiece of a telescope engenders a profound sense of loneliness.

Think about it. Without a telescope and a pitch-black sky free of Milky Way objects, we'd probably only see the Andromeda Galaxy, the Magellanic Clouds, and a handful of other galaxies. We would not see the hundreds of billions of other galaxies that telescopes reveal. As sentient beings, we are mostly – perhaps entirely – alone in the cosmos. If that realization doesn't impact an observer, then nothing will.

Thirdly, there is a fantastic diversity among types. For instance, consider the gaseous nebulas. There are emission nebulas, reflection nebulas, planetary, and dark nebulas. Each is unique, and many reveal amazingly complex and easily viewed details. From a visual perspective, the most unusual objects in the heavens are the nebulas. After completing the Astronomical League's (AL) Planetary Nebula Observing program several years ago, I realized the fascinating differences among this subclass of nebulas. Each is quite different from the others, but this is something that only a patient observer will come to notice.

Having completed enough AL observing programs to become a Master Observer, I can tell you that only after many years of observing does one truly appreciate the heavens above. This, too, is another reason why I observe.

AL observing programs are excellent pathways to getting to know the sky. Many dedicated observers have spent a great deal of time observing, compiling lists, and checking them to help would-be amateur astronomers get to see the most when it comes to observing the heavens. I have done this by compiling and observing nearly all the 500 objects on my astronomical observing bucket list. I strongly encourage those who have never tried one of these programs to begin with the most basic of all such programs, the Messier list. This will get them started viewing some of the easiest-to-observe objects in the heavens.

I suspect that some readers of this article will blithely pass by these comments without considering their implications for their lives. That's the difference between reading and comprehending the written word, and that's unfortunate. *The world is a beautiful book, but it is useless to someone who cannot or will not read.*

The examples outlined here typify the differences between seeing and observing. Yes, we have all seen buildings, but to dismiss buildings as so much stone and mortar is akin to saying that the majestic assemblies of Europe are not much different from what we see in our hometowns in America. As a highly experienced world traveler, I can say that nothing can be farther from the truth. The differences between seeing and observing are the differences between being a tourist and a traveler.

I am happy to say I am also a universal sightseer and a time traveler. I don't reside in my comfortable armchair watching TV or looking at pictures on my computer or in a book; I get out there and see things firsthand, and what a difference for the better it has made in my life! I encourage you to resolve to get out there and observe.

## THE JOYS OF AMATEUR ASTRONOMY

**The joys of amateur astronomy** can be described readily with five words: *knowing, observing, experiencing, sharing, and serving*. Most knowledgeable, experienced, and dedicated amateur astronomers have benefited from most, if not all, of these joys. As an Astronomical League Master Observer with a broad base of experience, I am one of those individuals. I feel duty-bound to share what my 60+ years as an amateur astronomer have revealed to me so that others can experience the same delights I have known. This article summarizes the joys of amateur astronomy to help new and less engaged amateur astronomers determine what they might need to include. Whether you are new to amateur astronomy or already involved, what joy or joys might you be missing? Let's find out.

**Knowing** – From the time of the ancients onward, generations have looked up at night to the heavens above in awe. Under the proper conditions, what we experience today can bring amateur astronomers even greater joy than that experienced by those before us because we know more about this world, this multi-layered sky. Allow me to explain.

The *first layer* of the sky consists of those things that can be seen with the unaided eye – the constellations and the appearance and motions of the sun, moon, planets, stars, and Milky Way. This is the layer of the sky that the ancients experienced. We see the star-studded constellations move silently overhead



Amateur Astronomy Today. Image credit Wikipedia

at night as part of a giant celestial clockwork. We see the sun course across the sky and note that the moon change place daily and exhibits a complete set of phases monthly. We experience eclipses of the sun and moon and view the transits of planets across the face of the sun. We observe occultations of stars and planets by the moon. We see planets moving forward and backward – prograde and retrograde – among the zodiac constellations. We see individual stars, colorful, scintillating, and sometimes changing in brightness. We see meteors and comets. We see the Milky Way from our vantage point within an assemblage of hundreds of billions of stars, crisscrossed by dust lanes, in a place we call home. Under skies untouched by light pollution, we can still see what the ancients saw and do so with even greater joy because the mystery (and sometimes the fear) has been replaced by knowledge.

The *second layer* of the sky consists of things contained within the Milky Way. Here we see the life stories of stars played out – their births, lives, and deaths. Today we know stars are other suns, boiling caldrons of radiant plasma, and much more. We see binary stars and know through study the details about individual components. Those smudges of light we often see are reflection and emission nebulae, star clusters, planetary nebulae, and supernova remnants. Through study, we have come to know star clusters and have surmised how individual stars are born, live out their lives, and die, even though the process takes billions of years. We learn about planetary nebulae, white dwarves, novae, supernovae, and black holes – stars whose lives have ended in the most peculiar ways. Most of these sights are within reach of readily available amateur telescopes and viewing them adds to the joys of amateur astronomy.

The *third layer* of the sky is the cosmos on a grand scale, with its nearly countless galaxies located far beyond the boundary of the Milky Way. While we can see a few brighter, nearby galaxies without telescopes under the proper conditions, we can rely on professional astronomers to examine their motion and know that the universe is expanding from an explosive start that occurred some 13.8 billion years ago. On the scale of our local group of galaxies, we find that the stars within galaxies don't move as they should, suggesting to us that a vast amount of the matter in the universe is "dark" and virtually undetectable, much like the Cheshire Cat from *Alice in Wonderland* whom we know only from its smile. On the grand scale, we have concluded that a mysterious "dark energy" is forcing the universe to expand faster and faster. Like the universe that surrounds us, astronomy is endlessly fascinating.

**Observing** – The wonders one can behold during an evening of viewing through a telescope – the moon, planets, comets, asteroids, stars, clusters, nebulae, and galaxies – can be stunning. The wonder is increased by seeing the object with our own eyes rather than viewing an image. Nowhere is this more obvious than with those who think about what they see – those who observe rather than merely see. Those who observe using both eye and mind experience more joy than those who see with the eye alone. Additional joy comes from the knowledge that we are experiencing photons that have traveled for vast periods over the great voids of space to end their trips in our eyes. Observing celestial objects about which we are well informed can be endlessly fascinating to those who observe, even after viewing the same object repeatedly. Each season – spring, summer, autumn, and winter – holds its own surprises that are renewed annually just by looking up.

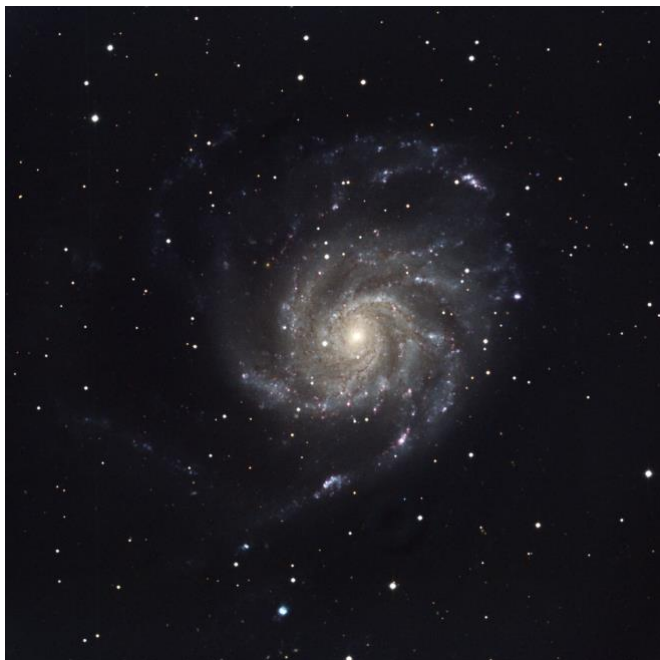
Another of the joys of observing is the sense of accomplishment experienced by those who have completed an observing program. Observing programs typically consist of a whole group of objects such as asteroids, comets, binary stars, open and globular clusters, and various types of galaxies. Some groups deal with various things, such as Messier objects, Herschel objects, Caldwell objects, etc. The Astronomical League's observing programs (see <https://www.astroleague.org/observing.html>) are activities with which all amateur astronomers should be involved if possible. When completed, these programs provide a sense of accomplishment and pride and motivate me to discover and learn more about the heavens above joyfully.

Observing the starry night sky with others adds another joyful dimension to amateur astronomy. The camaraderie, the *esprit de corps*, of amateur astronomy develops and is experienced when viewed with others. It's fun to share one's eyepiece and personal enthusiasm and experience the excitement of others when comparing observations using more than one telescope. While some amateur astronomers like to view together – teaching and learning as they go – other amateur astronomers find that astrophotography also provides a sense of joy and contentment.

Imaging, the process of taking photographs of celestial objects, is just as fascinating for many amateur astronomers as visual observing and sharing observations. The telescope and camera can and do what the eye cannot reveal. For instance, while viewing a galaxy through a fair-sized telescope (8"-12" aperture), observers usually see what appear to be "faint fuzzies." Some are circular, oval, and even lenticular; most are quite diffuse. Some have almost stellar cores, and spiral patterns can be directly observed with the aid of a telescope in a few.



What is more, however, is the fact that photographs reveal what the eye cannot detect on its own. Cameras can gather light in a way that the human eye cannot. Images produced through cameras and telescopes offer new spectacles that visual observers cannot enjoy in any other way.



M101, The Pinwheel Galaxy. Image credit Scott Wade, TCAA

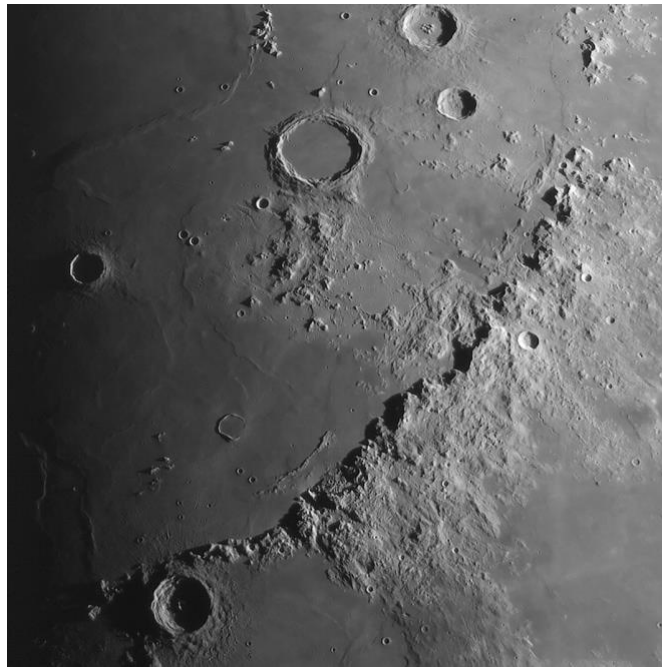
Astrophotographers are sometimes ready to point out that many things go missing when directly observed with the eye, that they can see what the eye and telescope together cannot reveal. They get a tremendous sense of accomplishment after many hours of stacking and processing images and often find delight in sharing their work with others.

Taking nice pictures of celestial objects isn't the only thing amateur astronomers do today. Some study the motions of binary stars, find and track asteroids and comets, perform photometry on variable stars, take spectra, and even develop and use radio telescopes. The variety of things that our more expert amateurs do sometimes approaches what professionals do. Amateurs are taking advantage of the technology of professionals, if only on a smaller scale.



UV through IR Solar Spectrum. Image credit Tim Stone, TCAA





The Lunar Surface. Image credit Tim Stone, TCAA.

**Experiencing** – Experiencing the technological marvels of modern amateur astronomy can also be a great source of joy. To technophiles, amateur astronomy is often a way to ride the crest of the wave associated with technological advancement. Today we have goto telescopes, auto finders, auto trackers, cameras, image stabilizers, observing aids, and telescope controllers on cell phones, tablets, and computers. Image acquisition, stacking, and processing software abound. Today's amateur astronomer can rival the imaging capacities of the world's largest professional observatories only a generation ago.

Telescope-making was quite the rage from the 1930s onward. Amateurs began to build larger and larger reflecting telescopes. Later, the rocker-box Dobsonian telescope design led to the development of light-bucket telescopes with 17.5" apertures and above. With the advent of commercial telescope makers in the 1960s and continued growth ever since it became possible to acquire instruments of varied sizes and designs at reasonable prices that satisfy every desire and need. It's common today to find amateur groups possessing telescopes from 24" to 32" in diameter, some of which are nothing short of professional grade.

A half-century ago, the standard amateur telescope was either a 60mm refractor or a 4.25" reflector. Anything larger was probably home-built, and then everything had to be found by using setting circles, star hopping, and sweeping. In addition to developments in the production of optics, mounts also flourished. The observing equipment available today to amateur astronomers is a little short of amazing. As a result, it's common for an observer to view 50 to 60 objects over an hour or two using computer technology with modern goto mounts. Amateur astronomers today tend to see much more than they did in the not-so-distant past.

Small commercial observatories became available to amateur astronomers starting in the 1970s. Today it's common to find domed and roll-off-roof observatories owned by clubs and even individuals. In some cases, rotating domes are interfaced with the telescopes within so that the proper alignment between the telescope's optical axis and dome slot is precisely maintained. Some amateur observatories are so advanced that they can be operated remotely without human intervention.

Because of vast improvements in remote control via computer networks, it is now possible to utilize telescopes worldwide – both optical and radio – from the convenience of one's home. I have utilized photographic telescopes in Chile, Australia, and elsewhere to image the night sky that I cannot directly observe from my home in Illinois. I once regularly used the 60-foot diameter radio telescope at the National Radio Astronomy Observatory in Green Bank, West Virginia, to observe quasars and other radio emitters using my desktop computer. All this came by way of being an amateur astronomer.

Another of the great joys associated with amateur astronomy is experiencing world travel, at least for those so disposed. Many amateurs have traveled the world in recent years to view total solar eclipses from remote locations, some of which they would never have visited were it not for the possibility of seeing a striking solar-lunar phenomenon. Not only do they view the

moon crossing over the face of the sun, but they also make memories that last a lifetime. The encounters with amazing cultures, languages, foods, and historical locations all serve to make these memories. They also meet many kindred spirits along the way with whom they will or have experienced the celestial wonders. Many lifetime friendships are forged as a result of these experiences.

So it is with attending state, regional, or national astronomy conventions. Attending NCRAL or AL conventions is a highlight for some amateur astronomers each year. Experiencing amateur astronomy through the eyes of others, meeting well-known speakers, visiting clubs, and other important astronomical facilities can bring the convention attendees lots of joy.

**Sharing** – Another of the many joys that amateur astronomers experience is sharing their love of all things astronomical with those who are not amateur astronomers. This is the joy of public outreach. It typically takes the form of participating in public viewing sessions where opportunities to give presentations and sky lectures and showcase celestial objects through their telescopes to visitors are involved. Many astronomy club members go home feeling fulfilled for participating in public viewing sessions. The memories of the ooohs and ahhs of someone who has seen Saturn or the moon for the first time tend to stick with those who made it possible. Answering questions and feeling the satisfaction of one who knows and is seen as an authority are reasons enough for joy.

Not to be forgotten is the use of media to promote amateur astronomy. Few among us will write weekly or monthly columns for newsletters, newspapers, listservs, and various forms of social media. For instance, some will use inexpensive software to create stunning night sky views, illustrating a particular point that can be exported for use with Facebook, Twitter, and the like. Creativity—visually and in a literary sense—brings joy to many amateur astronomers.



TCAA class funded by NCRAL Mini-Grant. Image credit C. Wenning

There is yet another joy of sharing, which comes from educating one's club members – by giving whole group presentations to active or even “armchair amateur astronomers” or working one-on-one with eager new members. There is much satisfaction in teaching others about astronomy and how to become a practicing amateur astronomer. While it's fun working with adults, working with youth can be particularly enjoyable. Youth are so impressionable and eager to learn that even their career paths can be significantly influenced by working with knowledgeable and experienced amateur astronomers.

**Serving** – Serving one's local, regional, or national astronomy groups is an excellent outlet for those with specialized interests. For instance, some members relish the leadership roles of Board members or president in their clubs, and those “on their way up” in the leadership ranks often serve as vice presidents or in some other official capacity. Those with writing interests and skills often serve as secretaries, newsletter editors, historians, and web admins. Some groups have even gone on to host regional and national conventions for Astronomical League, and specific individuals have even become national officers.



Northern Lights newsletter masthead. Image credit Terry Dufek, PAC

Knowing, observing, experiencing, sharing, and serving are the keys to the joys of amateur astronomy. Participation also can be *rewarding*. For instance, those who like to observe the heavens or provide other services can easily earn rewards through certificates, pins, and recognitions from the Astronomical League, their Region, or their astronomy club.

Astronomical League has many awards in addition to those associated with its many observing programs. There are so many awards that readers are directed to the following link: <https://www.astroleague.org/al/awards/awards.html>. It should be mentioned that several NCRAL members have been recognized with AL awards in recent years through several of these prestigious national award programs.

Additionally, NCRAL annually presents its *Region Award* to recognize those who have experienced the joys of amateur astronomy through *knowing, observing, experiencing, sharing, and serving*. The recipients of the NCRAL Region Award are the de facto authorities when it comes to the joys of amateur astronomy because they are so involved in every phase of amateur astronomy. The Region also annually awards the *NCRAL Newsletter Editor Award* for dedicated service. The Region also has its Seasonal Messier Mini Marathon observing program, certificates, and pins. All award winners are recognized in the Region's Northern Lights newsletter pages.

Some NCRAL affiliates also have awards. For instance, my club has four honorary awards: *Lifelong Honorary Membership*, membership in the *G. Weldon Schuette Society of Outstanding Amateur Astronomers*, the *Kieviet Founders Award*, and the *Miller Family Award*. Many clubs present similar awards to their members in recognition of various aspects of service or expertise. All these awards also are a source of joy to amateur astronomers both when they are presented and when the announcements appear in a club's publications.

So, there you have my perspective on the joys of amateur astronomy. While this list might not be all-inclusive, it does suggest the abundance of joy that amateur astronomers can experience if only they immerse themselves fully in the hobby of amateur astronomy.

## WHY JOIN AN ASTRONOMY CLUB?

Amateur astronomy is vast and sometimes rather complicated. Without help, one can get lost, which is why this guide has been developed. Consider the following reasons for joining an astronomy club:

**You can reap the general benefits of membership.** Clubs generally have abundant blessings in return for a comparatively small annual dues payment. So it is with the TCAA. To learn about TCAA membership and benefits, see [TCAA Guide #2 – Membership & Benefits](#).

**You can gain access to club equipment.** Many astronomy clubs have portable telescope loan programs or observatories with permanently mounted equipment. Depending on the club, there might be a lot or a little equipment for member use. The TCAA has some excellent equipment. Check it out in [TCAA Guide #2 – Membership & Benefits](#).

**You can learn from the experience of others.** Astronomy clubs often provide formal and informal instruction. There is an “organized approach” to learning that might take the form of a course or a mentorship that constitutes a form of “guided learning.” The TCAA provides both types of instruction for our members. Throughout membership, you can learn what to do and how to do it. You can take advantage and learn from the mistakes of others rather than experiencing them yourself.

**You can get advice from people you have come to know and trust.** Do you have questions about astronomy? Do you want to buy a telescope? Do you want to build one? How do you select the best eyepieces? How do you find objects in the sky? We can help you avoid the common pitfalls and choose an instrument that will further your goals in astronomy, not force you

to fail. Rest assured that you'll get unbiased opinions from those with lots of experience motivated by nothing but wanting to assist you.

## BECOMING AN AMATEUR ASTRONOMER

### Why don't more people become amateur astronomers today than in the past?

**Many people don't see the benefits of amateur astronomy as a hobby.** Serious amateur astronomy can be both time-consuming and expensive, but so can other hobbies such as bass fishing, craftwork, skiing, woodworking, model railroading, cooking, skydiving, sewing, playing a musical instrument, and just about any other hobby. At the same time, it can be gratifying. Amateur astronomy is not entertainment and doesn't lend itself to passive engagement. It's not a spectator sport. There aren't sides to choose, trophies to win, adulation to gain, or anything like that. Amateur astronomy – just like any other serious hobby – requires that you learn, and you don't become good unless you practice. It's a learning activity, and most of the congratulations you get will come from yourself and the relationships you develop.

**We have alternative means of dealing with boredom.** Recently, when going through the preface of the work *Brave Companions: Portraits in History* by David McCullough (1999), I was struck by the fact that he was pretty impressed with how the incredibly accomplished people he described in his book used only a finite amount of time to do what they did. McCullough noted, by way of explanation, "Tuning out boredom was harder then than it is today." When people get bored, they turn to their cell phones, tablets, and computers to alleviate this stress. Long ago, people didn't have these options, so to alleviate boredom, they immersed themselves deeply in hobbies, studies, and works of all sorts.

**We have unprecedented access to professional astronomy research results and images.** If you wanted to know what was going on, you had to subscribe to *Sky & Telescope* or *Astronomy* magazine. Now the media floods with discovery information. HST images are abundant and easy to find. Armchair astronomy has never been more accessible.

**Curiosity often takes a back seat to competition and earnings potential.** Today we have an utterly screwed-up value system that places more value on the potential earnings of a professional athlete over a researcher, even though the chances of becoming a professional athlete are astronomically small compared to becoming a researcher.

**Amateur astronomy has a diversity problem, but it shouldn't.** Amateur astronomy is for everyone. An unfortunate perception (tied to broader STEM issues) is that one must be a select group member to enjoy amateur astronomy. This just isn't so. At some points in history, science has mostly been the domain of white males, but that is no longer true. Race, creed, color, ethnicity, national origin, religion, sex, sexual orientation, age, physical appearance, mental ability, and educational status make no difference in one's ability to participate in and enjoy amateur astronomy and its community of avid observers and astrophotographers.

### Why don't more people become active amateurs once they show an interest in amateur astronomy?

**Many would-be amateur astronomers fall for media hype in terms of astronomical equipment.** Many amateur astronomers are surprised when it is suggested that they buy binoculars and a helpful finder chart instead of a "beginner's" astronomical telescope. Low power and wide fields of view make finding objects that might later be observed with a telescope easier. Of course, binoculars are not the end-all, be-all of amateur astronomy. Still, those who become accomplished viewers of the heavens with the naked eye and binoculars will know where to point telescopes when they acquire them. The fastest way out of amateur astronomy is to acquire a cheap toy telescope put away in a closet after a few disappointing uses and rarely sees the light of the universe again.

**Good astronomical telescopes are comparatively expensive.** – Amateur astronomy is a hobby, and most hobbies are costly – not that they need to be but because people who love a hobby are willing to spend considerable money to get the best materials. For example, model railroaders, shooters, collectors, and fishers think nothing when it comes to spending hundreds or thousands of dollars on a hobby. When asked a non-hobbyist how much our telescopes cost, we typically respond in the hundreds or thousands of dollars. The questioner walks away, bemused and wondering, "How could anyone spend that much money on a hobby?" This is because they don't know what love for a hobby entails. They don't have the passion that would allow them to make such a purchase. "Goto" telescopes are exceptional assets to amateur astronomy, but the cost is off-putting to anyone not already an amateur astronomer. The advantage of being part of a community of amateur astronomers

is that they can work together to purchase and share equipment. They can also mentor each other in their use. The Twin City Amateur Astronomers is a perfect example of these aspects of cooperation. Our two observatories were built with member donations and considerable volunteer effort. The club would not possess the resources it does, were it not for the generosity of club members.

**Urban light pollution puts convenient observing out of reach for many.** – When the author was a kid living in small-town Ohio, it was not difficult for him to walk out the back door at night and see many stars and the Milky Way. Because he had a small telescope, he could put it up then and there and start viewing the heavens. Today many people in America have moved out of small rural communities into more extensive urban settings, and seeing more than a handful of stars on a given evening can be problematic due to light pollution. The old saying, "Out of sight; out of mind," comes into play here. Even if people get to know a reasonably dark sky, going to rural settings is often impractical due to time, distance, and cost constraints. Without a doubt, the loss of the night sky has a deleterious effect on would-be amateur astronomers.

### **Why do so many people drop out of astronomy clubs shortly after they join them?**

**Too few will take the responsibility of working with budding amateur astronomers seriously.** Our group, the TCAA, is no exception. Until we conducted the membership survey last summer, it wasn't clear to us that we weren't serving the needs of new members. It's no wonder many people pay their dues and then are gone within the year. This phenomenon was the reason for offering the *Universe Sampler* course as an introduction to amateur astronomy. In retrospect, I now see the course as not entirely up to achieving the goal toward which it was aimed. Perhaps it would not be unreasonable for astronomy clubs everywhere to appoint someone to a new position aimed directly at recruiting and retaining amateur astronomers. These people would explain what amateur astronomy means as a hobby and provide transitional experiences to recruits.

People join to discover astronomy and then discover they're less interested than they thought they would be for whatever reason. It may take more time than they have. Perhaps they thought it was a daytime activity. Ultimately, they didn't enjoy it because they didn't understand it going in.

These are only some of the problems associated with amateur astronomy today. Now that we have identified the problems, we must resolve to do something about them. Historically, November through March is a time when the central Illinois sky is often overcast. This would be a reasonable time for active amateurs to plan for next spring...

## **Characteristics of a True Amateur Astronomer**

A true amateur astronomer authentically exhibits a deep passion for the hobby. A true amateur astronomer will spend an appreciable amount of time daily doing astronomy in some fashion. It might be reading, writing, or speaking with others. It might be planning observations, making observations, or cleaning up observing records. It might be spending time with others who are amateur astronomers, attending conventions or other private or public gatherings, or working on behalf of others in their club or the community. They might spend time preparing and delivering presentations for the public or doing "sidewalk astronomy" – showing interested passersby the wonders of the heavens with a telescope from a city street. *The key to being a true amateur astronomer is taking action in relation to the hobby nearly every day.* Unless wanna-be amateur astronomers are actively engaged in the pursuit, they cannot honestly declare themselves to be true amateur astronomers!

## **So, What's Next?**

1. **Attend several observing sessions.** Before purchasing a car, taking a test drive is always important. It isn't any different with an astronomy club. If you are unsure about astronomy as a hobby, attend several public observing sessions at Sugar Grove Nature Center. The dates, times, and topics can be found online at the following URL: <https://www.tcaa.club/api/events/public>.
2. **Join the TCAA and get to know its benefits.** Once you decide that the hobby of amateur astronomy is for you, join the TCAA. Read [TCAA Guide #2 – Membership and Benefits](#) to learn critical information about the club. This guide and the others mentioned in this document are available through the TCAA website at <https://www.tcaa.club/>.



3. **Read *The OBSERVER*.** As a TCAA member, you will receive our award-winning newsletter through the club's TCAA.US listserv. Read *The OBSERVER* and keep your eyes open for club-sponsored activities. See our newsletter archive at <https://www.tcaa.club/observer-mags>. Before you access this page, you might have to register with our website.
4. **Join the TCAA's Listserv and Facebook Page.** The club's listserv (see a recent copy of our newsletter for details) and [Facebook page](#) keep members updated with what's happening in the club and the sky. Facebook posts, in particular, provide activities for observers, most of which are suitable for an in-town observer viewing with the unaided key. Details can be found in each issue of *The OBSERVER*.
5. **Take a club-sponsored course.** Courses such as *Introduction to Amateur Astronomy* will provide you with formal training in the hobby of amateur astronomy. They will qualify you for using the Celestron 11" telescope housed under the dome of Sugar Grove Observatory. Read [TCAA Guide #1 – Introduction to Amateur Astronomy](#) to get up to speed concerning the hobby of amateur astronomy.
6. **Gain access to a high-quality telescope.** If you have a telescope, you can use it to make observations. If you don't have a telescope, you might want to borrow one from the astronomy club as part of its loaner program or use Sugar Grove Observatory. If you choose to purchase a telescope, do so only with the advice of experienced observers. At all costs, be sure to avoid toy telescopes that are unsuitable for serious astronomical observation. We won't teach you how to use such a telescope as we would not use them. Observing prowess – no matter how advanced – cannot overcome the limitations imposed by what most of us consider a junk telescope.
7. **Begin observing.** Using whatever telescope to which you have access, start viewing the sky. One of the best observing programs to pursue is Messier Club from the Astronomical League (AL). Complete information about the AL's observing programs can be found here: <https://www.astroleague.org/observing.html>.
8. **Build up your knowledge of astronomy.** There is no substitute for reading a general textbook on astronomy. While it is true that you will learn a lot about astronomy through your affiliation with the club, the information you receive will not constitute a systematic and comprehensive treatment of all subject matter. Consider enrolling in a university or community college course, pick up an associated textbook, and begin teaching yourself. Subscribe to a magazine like *Astronomy* or *Sky & Telescope*. Be sure to read the Astronomical League magazine *Reflector* which can be found online here: <https://www.astroleague.org/reflector/>
9. **Get to know club members.** Getting involved in club functions is the best way to get to know club members. Remember that while nighttime observing sessions are good, seeing each other's faces in the dark is hard. If you want to get to know club members, join us in our daytime events. See [TCAA Guide #2 – Membership and Benefits](#) for information about these events. Also, watch for announcements in *The OBSERVER*.
10. **Ask lots of questions.** Don't hesitate to approach even the most highly qualified club members with your questions. Everyone is delighted to help when and where they can. You will learn about things that might never be addressed by asking many questions. Ask our AL-certified Master observers about all things celestial. If you have questions about club property access, please contact our property master.
11. **Get involved in education and public outreach.** Amateur astronomers love what they do, and the best of them like to share what they know about sky-watching. The club is often involved in education and public outreach events. Consider first participating in these and then becoming involved yourself. Read [TCAA Guide #1 – The Art of Sky Interpretation](#).
12. **Learn how to use the club's advanced equipment.** Don't forget that the club has a sophisticated operation at Prairie Sky Observatory. Not sure if you are interested in astrophotography or other types of research based on astronomical imaging. Read [TCAA Guide #9 – Introduction to DSLR-based Astrophotography](#) and consider starting your photographic efforts with the club's astronomy-adapted DSLR camera using the club's telescopes. Watch out for our *Introduction to DSLR-based Astrophotography* course, and be sure to attend.
13. **Take on a leading role.** Once you have come up to speed as an amateur astronomer and are fully entrenched in the hobby, consider getting involved as a club leader. Once you do so, you will know you have "arrived" as a legitimate amateur astronomer.