DOWN HOME Gumbo Astronomy from Chaos Manor South!

Number 87 (New Series)
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In this Issue:

Skywatch
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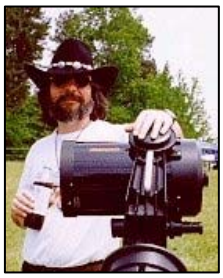
Uncle Rod Mollise's

Skywatch



Life with Sweet Charity

Uncle Rod

You know, "Charity," my little ETX 125PE whose coming to Chaos Manor South I reported on here a couple of years back. How are the two of us gettin' along now that the honeymoon is long over? I get that question a lot lately, mainly because of recent huge price reductions on this little CAT, I reckon—Astronomics.com will sell you one for $698.00, just a little more than half what I paid for mine.

Well, then, how about some ETX impressions from this past Memorial Day weekend? I'll admit I hadn't had the scope out much lately, but with that particular Saturday evenin' looking iffy, but me wantin' to see *something* from our club dark site, it seemed like the perfect time to let Charity prove herself. Actually, there was more to it than that. This informal holiday weekend run would likely determine Sweet Charity's *fate*. Would she stay? Or would she be listed on the Astromart? I had let a cute li'l 4-inch Stellarvue ED refractor turn my head, you see…

How *was* the weather down here in Possum Swamp over Memorial Day? Hazy, muggy, and warm (mid-seventies long after sunset). The ETX125 is easy enough to set-up and teardown, though, 5 - 10 minutes tops, that I didn't mind taking a chance on not seein' *nuttin' honey*. It did look as if that might be the case; I drove through a fairly intense thundershower on the way out to the club dark site near the metropolis of Tanner-Williams, Alabama. By the time I'd arrived, unpacked, and schmoozed with the three bubbas o' mine who'd shown up, the skies were looking a *little* better, howsomeever--if hardly perfect. While conditions were far from ideal all evening, my dark site getaway turned out to be well worth the trip. Hell, it was worth the trip for Saturn alone. The seeing was very good despite poor transparency.

Some o' the stuff Sweet Charity showed me:

Saturn. Yeah, seein' was purty hot even if transparency wasn't. A 9mm Celestron "Circle T" Ortho from way back when did a good job. As always, I was struck by the way subtle disk details stand out in this 5-inch MCT thanks to her good contrast. The N/S equatorial belts--and other features --are starkly visible. Not only did I see Cassini's Division despite the current ring aspect, I even glimpsed the Crepe ring.

M13. Nice. Charity didn't give up much to a buddy's NexStar 8 SE. In fact, Charity's view of the Great Globular was slightly *better*, I thought, with a darker background (at comparable magnifications) under these poor conditions--lotsa

light scatter from the light-dome to the east.

NGC 6210. Well, I *saw* the Turtle Nebula, at least.

M5. Again, my little friend didn't give up much to the C8, and this big ol' grandpappy of a glob looked amazing.

M92: Hercules' "also ran" globular star cluster was nearly as good as Numbers 5 and 13.

M10 and **12** were OK, but both of these Ophiuchus globs were in a particularly yucky part of the sky all evening and not as nice as they usually are.

M82. When the haze thinned a bit, I picked up a fair amount of this weird galaxy's dark-lane detail.

M3 and **M53**. These spring globulars both showed decent resolution.

M80: well, it was there, anyway. This small, compact (Shapley – Sawyer Class VII) globular doesn't often let me see stars with anything less than the C11 if conditions ain't just right.

M4, the Cat's Eye Cluster, did indeed show off its cat's eye aspect.

M68 is not often a standout, and in these skies, it was only a dimmish fuzzball.

M67: This aged galactic cluster has always been one of my faves, and on this late spring night I remembered to catch it before it plunged too far into the western murk.

M65 and **66**. I had a look at these Leo showpiece galaxies in the C8 "next door" first. They weren't that obvious in the 8-inch, and were barely there at times--but there nevertheless--in the ETX.

M105 and company. When this area of Leo was positioned in a good sucker hole, I was able to see not just 105, but the brighter of its two companion galaxies. I e'en imagined I saw a hint of Number Three with averted vision—quite a feat for a 5-incher on a poor night.

Omega Centauri was, by the time I thought to go there, about 10 degrees above the truly icky southern horizon. The Mother of All Globs appeared as a vague but large nebulous patch, not much worse than what it was in the C8.

M104: at times the galaxy's dust lane was visible.

M87. This monster elliptical was visible, sure, but dimmer than it usually is in this scope.

M107: "BARELY there" in the ETX125 *or* the C8. I had to convince myself I was really seeing this cluster in either scope.

Ghost of Jupiter (NGC 3242): this planetary was not only large and bright, but showed off a strong robin's egg blue color. The unexpected hit of the evenin'.

And so it went until the skies closed down completely at about midnight…

Let me add that every single object I requested was in the field of the 26mm Meade Plössl after a go-to. I didn't obsess about alignment. Didn't level the tripod; just plunked her down. Didn't pick special alignment stars. Merely did an LNT Easy Align and accepted whichever stars the Autostar came up with (Arcturus and Procyon). I *did* use a 25mm crosshair eyepiece to center the alignment stars, but that was the only particular care I took. Certainly not everything was dead center in the eyepiece after go-tos, quite the opposite, but everything *was* in the Plössl's field somewhere, from one side of the sky to the other.

Some folks question an ETX125PE's utility as a go-to scope what with all them computer alignments and Autostar button-pushin'. Truth is, "Easy Align" makes this a very practical scope for short observing sessions, though it wouldn't be my choice for a 5-minute glance at Miss Moon from the backyard. All that's required to get the 125PE goin' is to set the scope in a simple Home Position that consists of rotating the tube in azimuth a couple of revolutions till you hit the "hard stop." Once the o-n/o-f-f switch is switched to o-n, the scope does a little dance, finding north and leveling, and heads to the first of two alignment stars (you don't have to enter time or date; the battery-backed LNT module remembers all that). Center this star and the next one in the LNT red dot finder--much, much nicer than the insane optical finders of the old ETXes--and the scope is good to go.

Eyepieces? One of the joys of Sweet Charity is that she is not picky about eyepieces. I just slung a box of el cheapo 1.25-inchers in the car. In addition to the supplied Meade 26mm Plössl, I used a 20mm Orion (Synta) Expanse, a 15mm Expanse, an 11mm Birdseye (Anacortes, 80 degree AFOV), and, as above, an ancient Circle T Celestron Ortho. None of these oculars cost more than 50 bucks, give or take, but all essentially offered pinpoint stars to the field edge--one of the benefits that comes with Charity's f/15 focal ratio.

Evenings like this (and vacation trips) are why I bought Charity Hope Valentine in the first place, and she again impressed me in this role. You know what, though? The views she was delivering were so good that I began to wonder what she might do at a real DARK site. Maybe *someday*, you never know. Get rid of her? No way. The love affair continues. Two and a half years down the road, this little scope is still Uncle Rod's Best Girl--or *thinks* she is, anyway.

Galileo's Go-to

Ken Hutchinson

The Prehistory of The Telescope

The telescope had a curiously long gestation period and was most likely invented and reinvented several times by isolated individuals before becoming generally known. The Iraqi astronomer Ibn al-Haytham wrote what is probably the first book on optical theory in 1020 AD. Positive glass lenses were used as magnifiers in Europe from the 11th century. Both Robert Grosseteste and Roger Bacon describe in their 13th century writings devices that appear to be telescopes. Eyeglasses for correcting far sightedness were known in Europe from 1290, perhaps earlier in China. Eyeglasses with negative lenses to correct near sightedness were invented by Nicholas of Cusa in 1451. There are other documented reports of people using or making telescopes during these years, for example Leonard Diggs in the 16th century.

In spite of the fact that the lenses required to make at least crude telescopes had been available since the 11th century, and all the pieces needed to make the type of telescope that Galileo popularized had been available since at least 1451, the telescope remained a one-off device known to only a few people until something happened in October of 1608 in the Netherlands. Exactly what that something was is a bit of a

mystery. Making a telescope from lenses that had been in spectacle maker's shops for 150 years was child's play and, indeed, some believe it was children playing with lenses in the shop of Hans Lippershey who inspired his development of a practical telescope. Two other Dutch spectacle makers, Zacharias Janssen and Jacob Metius, were also exhibiting working telescopes in public that fall. We can't tell which of the three might have been "first," but it is apparent none of them were truly *the* first and that an unknown number of people must have done the same thing over the previous 300 years. We do know that Lippershey was the first to apply for a patent and that the Dutch government rejected the application because the device was, in their opinionm, too easily copied by other lens makers!

Galileo heard of this "new" Dutch device during a visit to Venice in May of 1609. He claimed to have made his own telescope within two days of his return to Padua, confirming the judgment of the Dutch patent examiners. Over the next year, he made progressively better telescopes and used them to study the sky. In March of 1610 he published *Sidereus Nuncius*, the first scientific report on telescopic astronomy. His work in the following years was so important to astronomy that he is credited with being the father of telescopic astronomy; he became the spark plug for a crisis in the Roman Catholic Church, and thus his name became attached to the telescope that Lippershey, Janssen, and/or Metius had developed.

It's been speculated that it was an improvement in lens-grinding technology that made the telescope a going concern starting in 1608, but Galileo reported he could find only 3 acceptable lenses in a lot of 300 that a local supplier delivered to him, so perhaps that technology, if it existed, had not made its way to Italy by then.

No matter how many unanswered questions remain about the genesis of the telescope, one thing *is* clear; the fall of 2008 marks the 400th anniversary of the beginning of the "telescope age" and several other notable 400th anniversaries related to the use of the telescope will occur over the next two years. It is a good time to consider the construction of a replica of these ground-breaking instruments.

Making Galileo's Telescope

I got the bug to build a Galilean scope because of a conversation about building or buying these instruments on Cloudy Nights. There is a Dutch museum that sells replica kits, but only to people who physically visit the museum, and these kits are not really suitable for astronomy. There are online sources for kits that have the same problem; however, I wanted a telescope that could reproduce the astronomical sights that astounded Galileo. I found the answer on Tom Pope's website:

http://www.pacifier.com/~tpope/Additional_Info.htm#Additional_Info

This page is a treasure trove of information on the topic. I copied his PVC pipe approach to making the OTA, and rather than duplicate his instructions here, I will refer those interested in making their own scope to the website. Tom also discusses some alternatives such as using cardboard tubes. What I will do here is outline the design choices I made, and note the construction differences between Mr. Pope's finished telescope and mine.

The easiest way to make a replica of Galileo's telescope is to do what Galileo did at least part of the time, and purchase the lenses from someone else. Some speculate that he ground some of his own lenses, but it is certain that he bought at least some of his lenses. The surviving instruments attributed to Galileo consist of two telescopes and a lens in the Galileo Room at the Museum of the History of Science in Florence, Italy. One of the telescopes seems to have an eye lens from a later period and neither is definitely attributed to Galileo--although both are typical of instruments from the period. The lens, however, *is* likely the lens from Galileo's "Old Discoverer" telescope he used to discover the moons of Jupiter and demonstrate they orbited that planet. This was the death knell for the geocentric theory of the universe and the source of Galileo's trouble with the Church. This lens is the one I chose to copy for my replica. It has an aperture of 58 mm and a focal length of 1700 mm. Based on the suggestion of Pope's web site I used Opto Sigma as my lens supplier and their 50 x 1500 mm plano convex lens, 011-3384, as my objective.

The eye lenses in the two museum telescopes are close to 20 mm in diameter so I adopted that as my eye lens diameter. A Galilean telescope is just like a modern telescope in that the magnification equals the objective focal length divided by the

eyepiece focal length. Galileo used up to 32x for his observations and stated in his notes that at least 20x would be needed to reproduce them. Looking at the Opto Sigma catalog, I saw they had a 50 mm plano-convex lens that would give me 30x and an 80 mm plano-convex lens that would give 19x, so I ordered one of each. These are part numbers 015-0140 and 015-0146 respectively. All this glass set me back $82.75 with shipping.

My design only approximates Galileo's Old Discoverer; it is the closest I could come with the Opto Sigma lenses. There is no particular reason to expend a lot of effort to approach it any closer unless you are trying to make a museum quality replica.

I made my tube out of PVC pipe which is easily obtained at any home center or hardware store in the United States. I used a 50-inch length of 2-inch pipe for the main body of the telescope. I made two eye lens draw tubes 16-inches long from 1.5-inch pipe. You wrap the drawtubes with duct tape in two places to build them up to a smooth friction fit in the main tube. For an objective cell, I used a 2-inch to 1.5-inch adapter and I bored out the 1.5-inch side on a lathe to allow the objective to fit. On the drawtubes, I mounted a 1.5-inch coupling sleeve and into the open end of this I nested adapter bushings until I reached a size compatible with my eye lenses. I then did some more lathe work to make cells for the eye lenses. I ended up buying $12.00 of pipe, fittings, and duct tape for the project and I have some of the pipe and a lot of the duct tape left over. The lathe work is something I chose to do because I wanted to. Tom Pope discusses alternative methods of making the lens cells that don't require a lathe. With some creativity and a sharp hobby knife you could make the cells from cardboard.

The white interior of PVC pipe makes a terrible telescope tube because it reflects stray light so well. I spray painted mine with the lens cells attached by blowing paint from a spray can into one end and then the other a few times. I sprayed all the components of my lens cells at the same time as the rest of the tubes, and this was a messy mistake as the accompanying photographs show. It *worked* but if you paint and make fancy turned lens cells like I did, you should mask off the areas where the lenses and mounting components go. Paint them later by hand with a hobby brush; I wish I had done it that way.

One thing that might take you by surprise is that the drawtube makes a nice piston in the well-sealed cylinder formed by the rest of the OTA. I knew this, and was trying to handle everything gingerly until I got around to drilling some vent holes in the drawtube, but I still managed to launch my precious objective halfway across the basement once by moving the drawtube in too quickly! Luckily, a cardboard box broke its fall, and even though it ended up on the concrete floor it emerged unscathed. You can see one of the vent holes I drilled in the drawtube in the photo where I am holding the spare drawtube. The photos illustrate pretty well how I made my telescope, which, after all, is a pretty simple device.

Walking in Galileo's Shoes

Given that he made his first telescope within two days of his return to Padua, Galileo's first night under the stars may have been similar to mine. I just had everything rough fitted together. There was PVC dust still in the tubes and fingerprints and more dust on both lenses. I lashed the whole affair semi-securely to a camera tripod and had at it. The first thing that will strike you as you turn it on terrestrial targets while you wait for night to fall is that the apparent field of view is *tiny*. People like to say that Abbe Orthoscopic eyepieces have a soda straw-like AFOV. You don't know what a soda straw view is until you look through a Galilean telescope! Pope gives the math on his website and I haven't dug into it yet, but I read elsewhere that the

apparent field is equal to the angle subtended by your eye's pupil at the distance between it and the objective. So that would

be roughly the inverse tangent of 7mm/1500mm for my telescope or 16 arc minutes!

This will not seem so bad in the daytime. You sight along the tube, compare what you see through the eyepiece with what you see with your naked eye, and you can quickly home-in on your target. When you do that, the view you get is as clear and detailed as you would expect from a modern telescope. There is chromatic aberration, how could there not be with two simple lenses made from the same glass? It doesn't prevent you from seeing far more than your naked eye reveals on a distant target, though. As you study a daytime target you quickly discover another quirk of the Galilean telescope. The apparent field is small, but the total true field you see in the telescope is fairly generous. You just have to move your eye around and that tiny circle of visible image pans around the target allowing you to see a total area many times the size of the image circle. It is like viewing the world by peering through a knothole in a fence.

At night that tiny AFOV becomes a major impediment to finding targets. I was out for an hour with this scope the first night, and in that time I succeeded in observing only three targets, and two of those were stars to practice and focus on. It took me many tries and many minutes to get the hang of pointing the telescope accurately and holding it steady with my rickety connection to the tripod. Eventually, I felt ready to try for Saturn. A little more fiddling with the aiming while sitting on the ground due to the length of this OTA, and then my heart stopped. There it was! A tiny, unmistakable disk floating in the little scope's miniscule image circle. Could it be? Yes, Saturn appeared to have "ears"! This is it; this is the thing that started a *revolution*.

Surprisingly, there is virtually no information on how Galileo mounted or aimed his telescopes, but one night under the stars was enough to prove to me that he must have had workable solutions for both problems to be able to make the observations he made. My solution was that I would put a Vixen dovetail for my ASGT mount on the tube when I did the final assembly of it, and that I would use my second drawtube to hold modern positive eyepieces and swap the negative eye lenses in and out of the other drawtube when I wanted to change powers in Galilean mode.

Positive eyepieces give you a much larger AFOV; the telescope becomes a conventional refractor when used with a modern eyepiece. Historians speculate that the negative eye lens was prized for its day. The tremendous AFOV advantage of a positive eye lens took a few years to be recognized, but it eventually became the standard for "astronomical" telescopes. Later, erecting lenses allowed the use of positive eye lenses for terrestrial telescopes too.

My second night out with the now-completed Galilean telescope went more smoothly. I had both conventional eyepiece capability for finding purposes, and a decent support. With the scope placed on my computerized CG5 GEM, it became a "Galilean go-to" on a mount so sophisticated as to be beyond Galileo's wildest dreams. Clean lenses and a blackened tube did not hurt either. Finding targets was no longer a problem, and once found they can be held in view indefinitely. Saturn was, as before, a disk with a hint of ears. A nearly full moon was out this time. Unfortunately, the terminator was nearly on the limb. Despite that, there were a few large craters that were nicely highlighted by oblique lighting. Quite sufficient to show that this perfect (*by doctrinal decree*) heavenly orb was not "perfect" after all. Normal low contrast details could also be seen across the face of the moon.

Once again, even a brief view is enough to give you a sense of the feeling that Galileo must have had upon viewing the moon for the first time. My intention is to try to duplicate as many of his observations as I can over the next two years, and that is why I took some pains to replicate his refractor fairly closely. I want to see what *he* saw, and the early indications are that this telescope does that very well. I'll also turn it on some favorite targets of modern astronomers to see what it can do with them--knowing that they are there gives me a big leg up on Galileo. I'm not planning to devote my observing life to this effort, but I do think that it will be an enjoyable and rewarding adjunct to my normal observing.

You might think modern optics are vastly better than anything he could have made or bought, but as Tom Pope discusses on his page, this does not seem to be

the case. By hand-selecting only the best samples from large lots of lenses, Galileo was able to get optics that were up to the task he set them to. Even the refractive properties of his glass and its clarity compare well with the BK7 used in my Opto Sigma lenses. The resolutions he obtained can be inferred from his observing notes, and they compare favorably with the limits set by the aperture he used. His Old Discoverer objective is larger than mine, but the evidence is that he stopped it down to 38 mm clear aperture. Most telescopes of this era are similarly stopped down. Lens production techniques of the day tended to produce large edge defects--though the lens centers could be quite good. Aperture stops were used then, as today, to eliminate the effects of a turned edge!

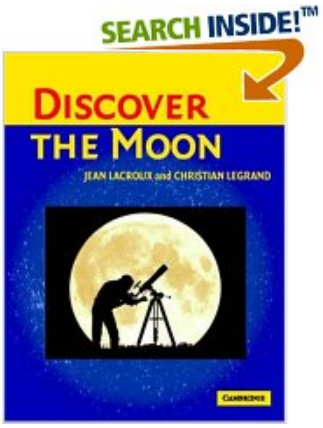
There are half measures you could take to sample the Zen of the Galilean telescope with less effort. You can certainly run a modern telescope in Galilean mode and stop it down to a 38mm aperture. All you need is a negative eye lens to convert a conventional telescope to a Galilean. An old, cheap eyepiece carcass could hold a negative lens from Opto Sigma or another source and give you 20-30x with the telescope of choice. A shorter, possibly lower power, telescope made as Tom Pope describes will illustrate many of the principles and "features" of the Galilean telescope, and could work well as a prop for talks and meetings.

With the 400th anniversary of the modern era of astronomy approaching, I think we all should spend some time trying to view the universe through the eyes of the first telescopic astronomer. Something as simple as a 38mm aperture stop and an eyepiece that gives 30x will do just that. Give it a try in memory of the man who founded the pursuit we love.

Jack's Mini-Reviews

Jack Fox

Discover the Moon **by Jean Lacroux & Christian Legrand, Cambridge University Press, 2003, soft cover, 9 x 7-inches, 143 pages.**



As books on the Moon go, this one is most unique in its concept. Besides having a bright yellow and blue cover, making it easy to spot day or night, the Lunar images are presented both as seen in a refractor/catadioptric scope equipped with a star diagonal (mirror reversed) *and* as in Newtonian telescope (inverted) on facing pages.

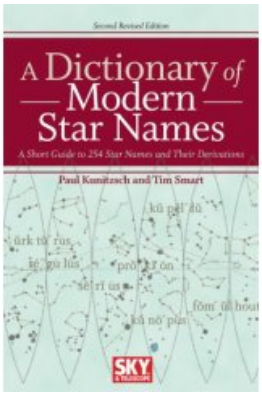
The book begins with a chapter on its use, which is followed with explanations of Moon astronomy basics. Next, it moves into equipment, when and how to observe, and, finally, basic astrophotography and electronic imaging.

The main body of the book is devoted to observing the Moon night by night starting after the new Moon and ending with the full. Each photo of the Moon's phase has a compass/telescope icon to let you know which telescope orientation you are looking at. The inside front and back covers have a full photo of the full Moon in the proper orientation for each view. Each phase's image has boxes with numbers highlighting the most interesting features of that evening's view. The text corresponds to the numbers giving you a written description of the numbered feature. A yellow box in the lower right side page lists the features numerically for a quick glance of the nights highlights. In addition, most pages have a blue box giving interesting bits of lunar information.

The last chapter deals with observing the Moon in its waning gibbous phase with page references as to which photos match from the waxing phases featured in the main body of the book. The book concludes with a list of lunar resources and a modest glossary of terms.

This book was originally published as *Decouvrir la Lune* in French in 2000, and translated into English by Cambridge University Press. This is occasionally evident as some captions are still in French. My only major complaint is that I wish it was spiral bound so that it would lay flat at the observing table. Nonetheless, this is an outstanding book for "Lunar-tics" who can't get enough of our nearest celestial neighbor.

***A Dictionary of Modern Star Names* by Paul Kunitzsh & Tim Smart, Sky Publishing, 2006, 2nd edition, soft cover, 5 ¼ x 8 1/8-inches, 68 pages.**



Originally published in 1986 as *A Short Guide to Modern Star Names and Their Derivations* in Germany, this book has an Old World look and feel to it. The paper stock has an almost newsprint quality and an antique-looking type face. It is like a read through the *101 Arabian Nights* with all the references to Arabic and Greek origins and mythologies.

The introduction explains the correct pronunciation, derivations, and origins of the names used for the 254 stars in the book. It also includes a brief time-line, and explains how the names were changed or reinterpreted in each time. Charts on how various languages pronounce their vowels assist you as you read through the book.

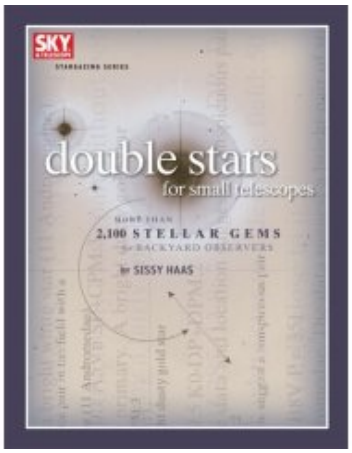
The main section is broken down by constellations and by the major stars, which are listed alphabetically with their corresponding Greek letters. The star names only are also listed alphabetically in the index at the end of the book.

In each chapter, the stars listed have their pronunciations (sometimes multiple) to the right of their names, and also a paragraph or two giving you the historical significance and the derivation (if any) of the star plus any other interesting fact about the star.

This book is not intended to further your general astronomical knowledge, but to educate you on name origins of these celestial lights. It is a nice reference source and the information can be entertaining should the topic of stars come up in you next conversation.

***Double Stars for Small Telescopes* by Sissy Hass**

Sky Publishing, 2006, 173 pages, size: 8 ½ x 11-inches.



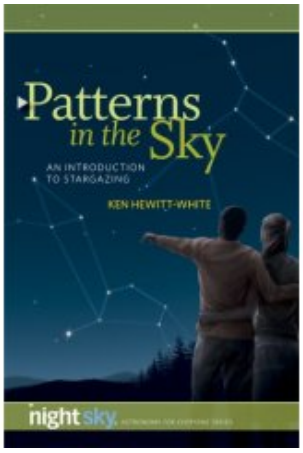
This clearly-written book covers the basic information needed to understand the attraction double and multiple stars have for the amateur astronomer and, most importantly, how to find them.

Reading the introduction, you realize that the author has an excellent understanding of her subject matter and communicates it well to the reader. This shows in her ability to explain and keep my attention (no easy task). Her explanations and examples kept my interest and made me want to start observing immediately. The charts and graphs included illustrate very well the technical aspects of observing, with detailed descriptions of the many subtle colors of the stars as they appear to the eye through the telescope. The explanations illustrate how stars are measured by magnitude, color, temperature and separation. A handy chart is printed on how far apart the stars will be separated in various scopes by their aperture.

An easy to understand legend in front of the first catalog page helps you locate your target. The catalog is organized by constellations. With each star you are given the right ascension, declination, name, year, position angle, separation, magnitude, spectral type, status and observers' comments. Most comments, made by contributing astronomers, include the aperture and power of the telescope used.

Sissy Hass show us how to gain yet more pleasure from our scopes in observing the unlimited beauties of our universe. This is a reference book I will keep close by for one of those leisurely nights where I am not rushed to find yet another challenging object before it moves out of sight, but can instead enjoy the beautiful multi-colored lights of the heavenly Christmas tree.

***Patterns in the Sky* by Ken Hewitt-White**
Sky Publishing, 2006, soft cover, size: 6 x 9-inches, 98 pages.



I've been having fun with astronomy for the past 17 years, but still consider myself a novice. That is why I get excited about new books written for astronomy-challenged people like me. *Patterns in the Sky* by Ken Hewitt-White is just such a book. It was one of the first in a series of books sold in conjunction with Sky Publishing's now-discontinued but excellent *Night Sky Magazine*, which was aimed at beginning and intermediate-level astronomers.

The introduction gives the reader a concise overview of basic astronomy with colorful illustrations that make it easy to understand. It contains a list of constellations and stars you will be viewing throughout the year, and two fold-out star charts covering all four seasons. The book is organized by seasons with the best objects visible being showcased. Each season's chapter contains interesting astro-facts, mythology, charts, photos, and diagrams to help the student find those objects in the sky. The book concludes with a helpful glossary and resource information.

You don't need a large telescope or huge binoculars or vast knowledge of the sky to use this book to find celestial wonders. This is entry-level astronomy directed at the masses, but can be a stepping stone to a greater understanding of the stars.

The Great American Astronomy Club

Uncle Rod

How about it? What is the state of the great American astronomy club? What do *I* think? It's in considerably better shape at this juncture than I figgered it would be. For a while there, I--and quite a few other members of the amateur astronomy chattering

classes--believed the non-virtual astronomy club was *dead*. What with sci.astro.amateur (s.a.a.), Cloudy Nights, Astromart, and the Yahoogroups ridin' high 24 hours a day, who needed that boring monthly meeting down to the school, college, science museum, whatever?

Reality has turned out to be a little different than we imagined it would back in those heady days of the "new" amateur astronomy—Internet amateur astronomy—in the mid-1990s. For one thing, s.a.a. has more or less imploded at this point, having been taken over by trolls and nutcases. Sure, the other above-mentioned I-net venues are insanely popular in a modest amateur astronomy sort of way. B-U-T. But many of us have discovered "virtual" doesn't quite fill the bill club-wise.

Nice as the online hangouts may be (Cloudy Nights' forums are elegantly functional and very active places), you can't go observing with most of your Astromart forum buddies—or drinking afterwards with your Yahoogroups chums—and, more importantly, the Internet Astronomy club doesn't foster the public outreach that's the life's blood of our hobby.

Some new amateurs do come onboard our avocation after stumbling across SCT-User or Talking Telescopes online, but most Newbies still come the same old way they always have: after a look through a scope at Astronomy Day or a public star gaze. If for no other reason, *that's* why the American astronomy club must and shall survive.

Some Random Observations (that fit every club I've ever belonged to, and I've belonged to a *few* over the last 40 years):

--*Uncle Rod's Club Law*: No matter what the size of your membership, multiply that number by 0.1 if you wanna know how many folks will show up at a club star party, a public outreach session—or any other non business-meeting function. I used to worry about this, but have come to realize that it's a constant that will never change. The Gravitational Constant of the Astronomical Society, I guess.

--Ever notice the same people who complain about the cost of Astronomical League dues are also the first to complain if their issue of *The Reflector* is a day late?

--You also have to wonder if this bunch *reads The Reflector* when it arrives, as they're *also* the ones who, when the dues discussion comes around (again), make it known *loudly* that they have no *idea* what the League does.

--There is a place for armchair astronomers in every club. But I always wonder about a mindset that finds business meetings and *Robert's Rules of Order* more interesting than *telescopes.*

--Amateur astronomy is not the private preserve of middle-aged geeks. When that brand-new and young novice shows up at a meeting, enthusiastic and full of innocent questions, make her/him feel WELCOME. Don't do as many amateurs I've known do and glower and start talking about UGC galaxies and Strehl ratios. Smile and TRY to answer the time-honored question, "Which is better, the Meade or the Celestron?"

--When was the last time you took a good look at your membership? Is it <u>all</u> middle-aged white males? If this hobby is to grow or even maintain an even keel, we MUST take it to women and minorities.

--And when was the last time you raised your hand? To volunteer to do a program for the next meeting? To serve as an officer? To chair a committee?

--All business and no fun makes for dull clubs. Deadly dull. One thing we do down here in Possum Swamp is hold at least one meeting a year in a nice restaurant and eat and drink into the wee hours. Believe you me, after a few bourbons you'll come to know your fellow members *much* better.

--You know that guy at your club who annoys the hell out of you? You annoy him just as much.

--Why is it (Andy Rooney mode ON) that those people who lobby the most for a dark/darker club observing site are the same ones who would never *dream* of showing up at said site to observe?

--Doing too much (as a club) can be as bad as doing too little. Stop and smell the roses once in a while.

--Finally, I will say it again, if your club does nothing else, take advantage of every public outreach opportunity that comes along. Even "just" a 15 minute talk and a peep at Mr. Sun at the local school. These little presentations make ripples, and you never know how far they will spread. It is not too much to say the future of amateur astronomy—and maybe even professional

astronomy—depends on you gettin' your butt down to the Cherry Street Elementary School way-too-early on a Monday.

I could go on, but my gut feeling? The Astronomy Club will survive *if* we want it to and *if* we work at it. Now, get out there and do that!

NASA's Space Place

OZONE, THE GREENHOUSE GAS

We all know that ozone in the stratosphere blocks harmful ultraviolet sunlight, and perhaps some people know that ozone at the Earth's surface is itself harmful, damaging people's lungs and contributing to smog.

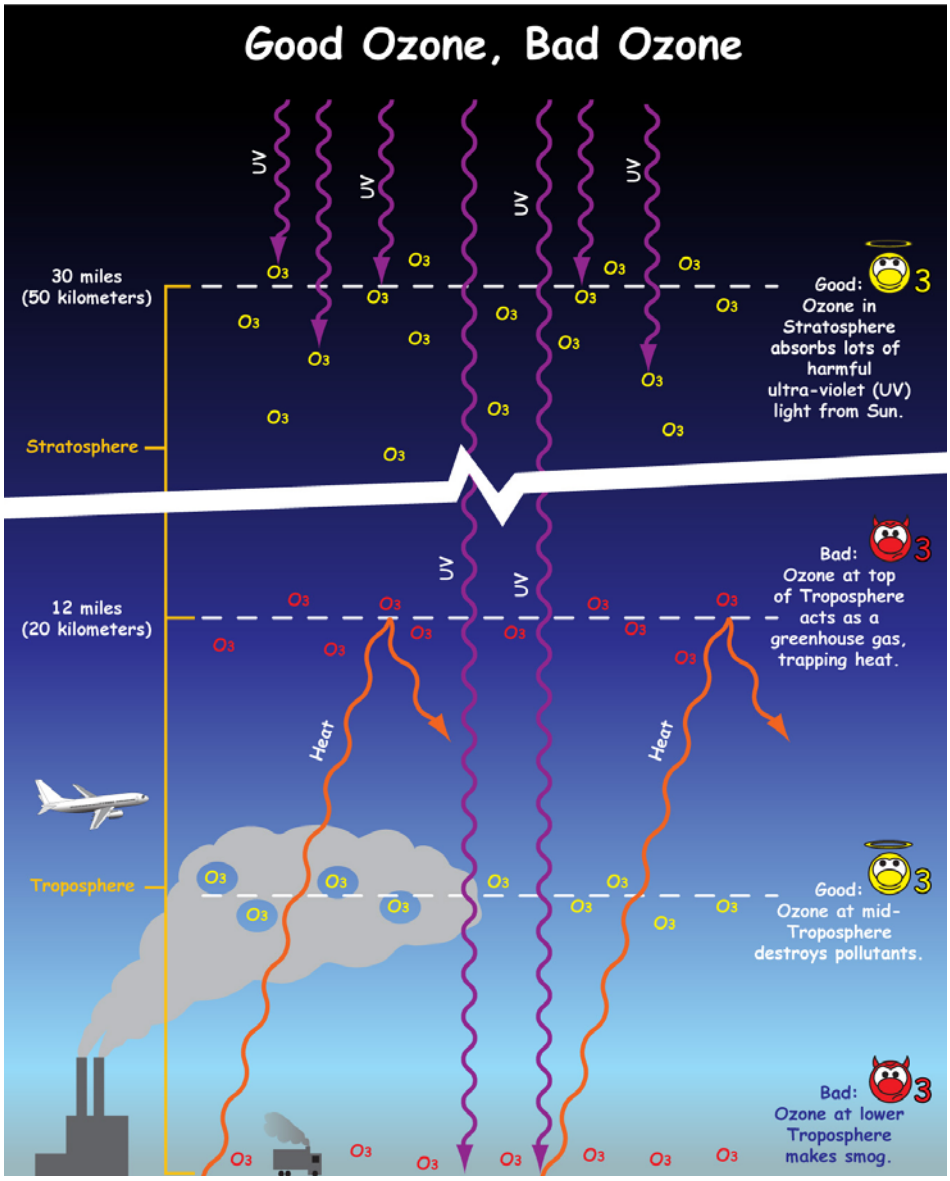
But did you know that ozone also acts as a potent greenhouse gas? At middle altitudes between the ground and the stratosphere, ozone captures heat much as carbon dioxide does.

In fact, pound for pound, ozone is about 3000 times stronger as a greenhouse gas than CO_2. So even though there's much less ozone at middle altitudes than CO_2, it still packs a considerable punch. Ozone traps up to one-third as much heat as the better known culprit in climate change. Scientists now have an unprecedented view of this mid-altitude ozone thanks to an instrument aboard NASA's Aura satellite called the Tropospheric Emission Spectrometer—"TES" for short.

Most satellites can measure only the total amount of ozone in a vertical column of air. They can't distinguish between helpful ozone in the stratosphere, harmful ozone at the ground, and heat-trapping ozone in between. By looking sideways toward Earth's horizon, a few satellites have managed to probe the vertical distribution of ozone, but only to the bottom of the stratosphere.

Unlike the others, TES can measure the distribution of ozone all the way down to the heat-trapping middle altitudes. "We see vertical information in ozone that nobody else has measured before from space," says Annmarie Eldering, Deputy Principal Investigator for TES.

The global perspective offered by an orbiting satellite is especially important for ozone. Ozone is highly reactive. It is constantly being created and destroyed by photochemical reactions in the atmosphere and by lightning. So its concentration varies from region to region, from season to season, and as the wind blows.



Data from TES show that ozone's heat-trapping effect is greatest in the spring, when intensifying sunlight and warming temperatures fuel the reactions that generate ozone. Most of ozone's contribution to the greenhouse effect occurs within 45 degrees latitude from the equator.

Increasing industrialization, particularly in the developing world, could lead to an increase in mid-altitude ozone, Eldering says. Cars and coal-fired power plants release air pollutants that later react to produce more ozone.

"There's concern that overall background levels are slowly increasing over time," Eldering says. TES will continue to monitor these trends, she says, keeping a careful eye on ozone, the greenhouse gas.

Learn more about TES and the science of ozone at tes.jpl.nasa.gov/. Kids can get a great introduction to good ozone and bad ozone at spaceplace.nasa.gov/en/kids/tes/gases.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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My Back Pages

"Crimson flames tied through my ears
Rollin' high and mighty traps
Pounced with fire on flaming roads
Using ideas as my maps
"We'll meet on edges, soon," said I
Proud 'neath heated brow.
Ah, but I was so much older then,
I'm younger than that now."

Club Notes: News of the Mobile Astronomical Society

What's happenin' down yonder at your friendly, neighborhood astro-club? Some newsbytes from the MAS:

- Alas, we're continuing our tradition of clouded-out public star gazes. We attempted one for the Mobile Police Department's Camp Grace youth project. Good turnout by the membership considering the fact that there were clouds everywhere by sunset. Viewing? None. We hope to work with the MPD on future projects, however.

- As for our Members Only Star Parties, we've actually been fairly lucky. No, conditions haven't always been good, but we've seen a lot o' stuff this spring. Never been to one, but want to try your scope under dark skies? The only requirement for attendance is that you be a **paid-up** MAS member. Contact any of your club officers: George, Rod, Judy, and Martin for details.

Bad news time. Not only is the execrable Beavis and Butthead "show" back on the air, the two imbeciles have been HELD BACK for yet another year in high school (they must be in their thirties by now). So…expect more huh-huh/heh-heh foolishness for the foreseeable future.

"HEY, YOU IDIOTS. WHAT ARE YOU DOING WITH THAT MAYO JAR. YEAH, <u>THE ONE KEPT ON FUNK AND WAGNAL'S PORCH FOR A FORTNIGHT.</u> YOU'D BETTER NOT THROW--<CLUNK>

RUMOURS

Wanna learn all about Celestron? As I have said *many* times, there's no better place to do that than in the pages of Robert Piekiel's fantastic e-book, ***Celestron: The Early Years***. How do you get it? Here it is straight from the horse's mouth:

"People interested in purchasing my *Celestron: The Early Years* CDROM can email me direct at piekielrl@yahoo.com. I regularly advertise it on

Astromart, but there are lot of readers out there who don't use Astromart. Thanks, Bob Piekiel."

You're welcome, Bob. My opinion? And Uncle Rod's opinion? Every SCT-using amateur NEEDS this book!

More Meade worries. While the recent teleconference call sounded hopeful—the Meade bunch even said they have a new "telescope product" coming "in the next few months" (apparently beginner-oriented)--it's hard to know how much **stock** to put in such optimism. Meade's stock is, in fact, now trading below $1.00 a share, and if it doesn't climb soon, the company will be *de-listed*. Which doesn't sound good to me. Other news from the fone-call? All production is now in Mexico (high end products) and China (ETX and everything else). Meade worldwide personnel headcount is down to 250. It is "hoped" the company will break-even next year.

The most interesting news from Celestron ain't about Celestron. The company, at parent Synta's behest, has cranked-up **Sky-Watcher U.S.A.** to sell *more* Synta scopes and accessories under the Sky-Watcher brand name, including the new flex-tube Dobbies and Sky-Watcher branded SCTs mounted on Synta's EQ5 (**see page 12**). One thing the Anonymous One noted on the company's website: the 11-inch SCT is much more expensive than its C11-SGT (CG5 mounted) twin. It's over THREE GRAND. Misprint? Dunno. The same price is quoted in the Sky-Watcher ads in the current issue of *Sky and Telescope*. People are wondering what impact Sky-Watcher U.S.A's birth will have on Orion. My guess? None. Synta is only too happy to sell its gear under as many nameplates as it can. I hardly think they'll yank their stuff from the Big O.

Speaking of *Sky and Telescope*, we were distressed to learn that MR. *SKY AND TELESCOPE*, Executive Editor Kelly Beatty, is leaving because his position has been eliminated. **Real bad move on your part, New Track Media**. With all astronomy magazines having a hard time at the moment, getting rid of somebody with more than thirty years of experience at *Sky and Telescope* is NOT smart. Sigh.

Problems in LX90 land. The LX90, which has heretofore been one of Meade's most problem *free* telescopes, is causing a lot of frustration for new owners. During normal alt-azimuth tracking, *many* LX90 users, including recent purchaser **Mike Weasner**, are reporting significant vibration/image movement in declination/altitude. The scope jumps. Initially, Meade was replacing 90s, but is now offering to repair them instead, since replacement scopes all appear to suffer the same affliction. Stay tuned and watch the LX90 Yahoogroups before purchasing this usually sweet scope. Meade needs to jump on this JUMP with both feet or risk creating lots of new CPC 800 customers.

The <u>other</u> famous Chinese (Taiwanese) scope maker, GSO, is moving on a couple of fronts. First, with a new series of truss-style Dobsonians, which are to be sold initially by Zhumel and Astronomics. This scope line, which includes an inexpensive 16-inch, appears poised to create some real competition for troubled Meade's LightBridges. Even cooler is a popular-priced Ritchey-Chrétien (in 6 and 8-inch apertures for now) which is to be sold, like the Dobs, by Astronomics. How popularly priced? For the unheard of fares (for RCs) of 1295 and 2995 US greenbacks, respectively.

Synta ain't hatching any RCs that I know of, but they *do* have the new truss-style "Flex Tube" Dobbies. Yeah, I know, "flex" ain't a particularly promising name for a scope, but according to the folks who've used them, these 8, 10, and 12-inch (no 16-inch) scopes are solid. The "flex" part refers to the fact that, when used as intended, the upper cage and truss tubes are not removed for transport, but collapsed, leaving a compact and quickly assembled package. When will these be seen these in the U.S.? Until the other day I'd have said "don't hold your breath," but with the coming of Sky-Watcher USA, I've changed that to "soon."

--The Anonymous Astronomer

The Wrap-Up…

A little thin this time, you say? Well, yeah. You know why, doncha? Because YOU ALL didn't contribute enough **stuff**. If you read this here little newsletter regularly, *and want to see it continue*, resolve to contribute something…a cartoon, a review, an image, a star party report…to the Fall issue. OK, soapbox mode off. See y'all then. Keep them Naglers dry.

--The Skywatch Gang