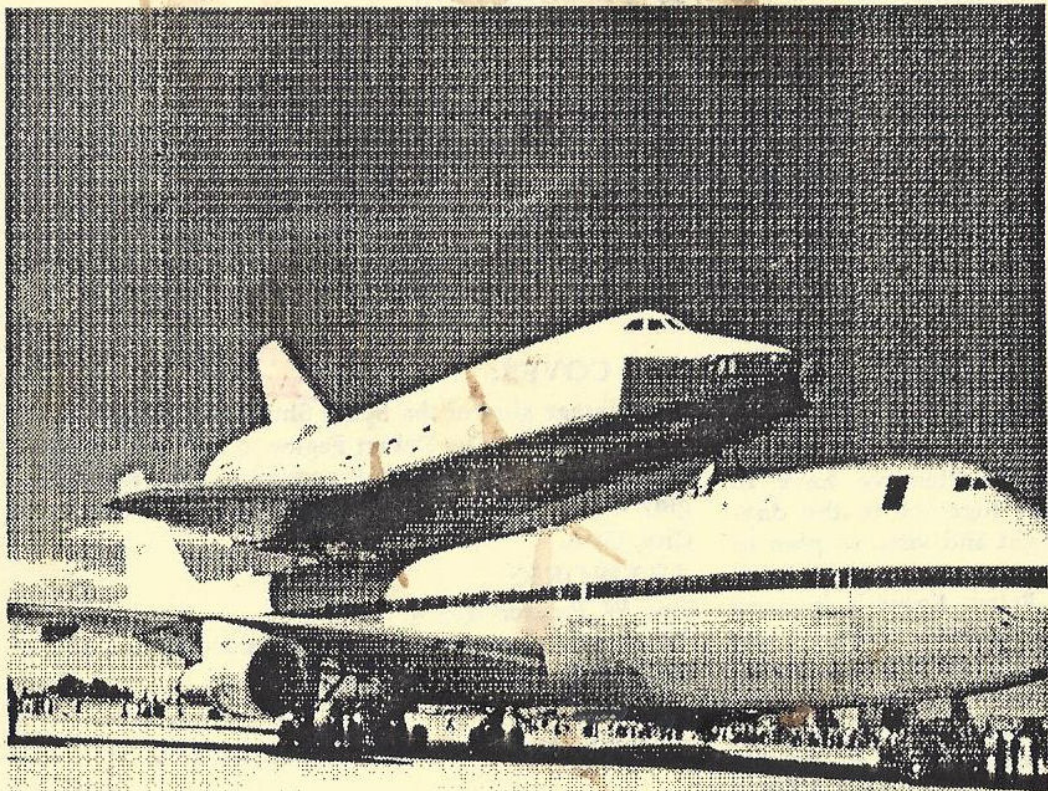


Prime Focus

April, 1988

Magazine Of The Fort Worth Astronomical Society, Inc.



From The Editor

As the weather improves and we can observe without freezing, more of us will turn out for observing nights. I also hope this means more of us will turn out on the pages of *Prime Focus*. As vacations begin, many of you will have interesting trips or unusual observing experiences to tell us about. When people and telescopes mix, the unusual happens.

Plans for Astronomy Day are moving right along. Saturday, April 23 is the day and the festivities will begin at 3 p.m. There will be a cookout with grills provided. Bring your own picnic. George Proctor will conduct another auction. Last year's auction was very successful. Come in a bidding mood. There will also be bocce ball, badminton, a rummage sale (if we have any rummage) and solar viewing. Hopefully we will also have a clear night, so bring your telescopes. This is one of the few opportunities we have to get together in the daylight and visit, so plan to come have a good time.

Prime Focus is in need of articles, reviews, artwork; all the things you read each issue. Read something interesting lately? Write it up for *Prime Focus*. Had a highly recommended piece of equipment fall apart? Write a review. Run across a new book you wouldn't be without? Let us know. This magazine will get thinner and thinner if you don't!

Get your contributions in the mail and we'll see you on Astronomy Day!

CONTENTS

3 FWAS News

4 REPORT 41° 20": Myth Busting
Al Sarrantonio

6 THE COMET HALLEY A REMEMBRANCE
Ted Inlow

7 KIDSTAR: Our Sun
Becky Nordeen

8 THRU A CAT'S EYE: The Other Magazines
Geo. W. Proctor

10 PICTURE THIS
Jay Hornsby

12 DEEP SKY
Bob Newman

14 SKYWATCH
Kaye Hutchins

OUR COVER:

A vintage shot of the Space Shuttle prototype *Enterprise* was sent in by Robert Fagley to help test computer scanning, and we liked it enough to use. Robert Fagley is Becky Nordeen's father and lives in Salt Lake City, Utah.

ARTWORK:

Geo. W. Proctor--4, 5, 6

Other artwork comes from clip art sources.

EDITOR: Becky Nordeen

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FWAS NEWS

RUSHING TEACHES CLASS

Cliff Rushing will be teaching classes on observational astronomy for the Arlington Recreation Department. The first class for children begins March 29 at 8:00 pm. This class will meet for four sessions. The adult class starts April 26, for two sessions. Both classes are at Hugh Smith Recreation Center, 1815 New York, Arlington, TX. There is no charge for either class, but a \$2.95 text book will be used. Classes will cover types of telescopes, mounts, and objects of interest in the night sky. To register, call 275-1351.

FWAS ON CABLE

The Fort Worth Astronomical Society is advertising the monthly meetings on the Sammons Cable Public Access channel. Watch for our listing the week before each meeting.

DARK SKIES FOR PALOMAR

The Palomar Mountain Dark Sky and Environmental Defense Organization includes FWAS on their mailing list. This is a group of people who monitor planned development in the Palomar Mountain area with an eye toward protecting the dark sky conditions surrounding one of this country's major observatories. If you are interested in this group, the address is Dark Sky and Environmental Defense Organization, Palomar Mountain, Ca. 92060.

ASTRONOMY AND DEEP SKY NOW AVAILABLE TO FWAS MEMBERS AT REDUCED RATES

Astronomy Magazine has announced it will offer reduced rate subscriptions to astronomy club members. The rate for *Astronomy* will be \$14.00 per year. In addition to *Astronomy*, Kalmbach will offer *Deep Sky*, *Telescope Making* and *Odyssey* at lower club rates. For details, contact Monty Truitt.

STAR SQUADS HOLD FIRST STAR PARTY OF THE YEAR

FWAS Star Squad members held the

first star party of the year during March.

For the third year in a row the 5th graders at Wimbish Elementary School in Arlington were treated to a view of the heavens thanks to our members. An estimated 50-75 students, teachers and parents attended. Star Squad members in attendance were Becky Nordeen, Kaye and Jim Hutchins, and Lana and George Proctor.

Members wishing to help with star parties or groups wishing to schedule one should contact FWAS Educational Director Lana Proctor at (metro)265-5419.

ASTROPHOTOGRAPHER SHARES SLIDES WITH SIERRA CLUB

On March 16 FWAS Trustee George Proctor was guest speaker for the Fort Worth Branch of the Sierra Club. During a 30 minute presentation before an audience of an estimated 100 members, Proctor offered a sample of night sky wonders via a collection of his astrophotography slides.

Several Sierra Club members displayed an interest in trying a few shots of their own, Proctor said.

APRIL MEETING
Friday, April 15, 1988
8:00 PM Gate Open
Bell Observatory
Springtown, Texas
817-523-7026

OBSERVING SCHEDULE

April 8-9
April 15-16
May 13-14
May 20-21
June 10-11
June 17-18

MEETING DATES

May 20
June 17
July 15

REPORT 41° 20':

MYTH BUSTING

by AL SARRANTONIO



I just love busting myths.

Maybe it has something to do with being a writer. Most writers are nonconformists by vocation--"nonconformist" being a nice term for misfit--and apt to be cynical where dogma or authority is concerned.

Or maybe I'm just a yamhead.

Anyway, there are a bunch of myths in amateur astronomy that need busting, and today, after waiting yet another day for royalty checks that didn't come in the mail and contracts from publishers that were promised months ago and have yet to materialize for my signature (any of you out there who think writing is glamorous please note that Webster's Dictionary defines a publisher as a used car dealer who drinks martinis), I'm in a fit mood to bust them.

And so...(heh heh heh):

MYTH #1 YOU SHOULDN'T DRINK ALCOHOL BEFORE AN OBSERVING SESSION. This statement is only untrue because it's incomplete. The entire sentence should read:

YOU SHOULDN'T DRINK ALCOHOL BEFORE AN OBSERVING SESSION ONLY: YOU SHOULD ALSO DRINK ALCOHOL DURING AND AFTER AN OBSERVING SESSION.

There is a conventional (read: dogmatic) wisdom that alcohol consumption

somehow impairs night vision, making it harder to pick up faint deep sky objects. This is in no way true. After great alcohol consumption I have seen more deep sky objects, such as the Pink Elephant Nebula (I don't remember exactly where it was; somewhere between Taurus and the Pleiades) and the Winking Star (I distinctly remember Kathleen Turner's face floating in front of my objective, somewhere in the southern sky, giving me the eye--I'll take a lie detector test if you want). In fact, after fourteen or fifteen Bud Lights, I've found that I don't even need a telescope anymore--I just lay on the ground, look up at the sky and let the show begin. I'm working on a plan to put Celestron and Meade and all the others out of business by taking out large ads in the magazines offering guaranteed better views than any scope in production; I'm going to call the company Astro-Drunk and will ship (UPS of course) big crates of cheap wine and Sterno instead of telescopes.

I also have a solution if, for some odd reason, your own vision is impaired after consuming large quantities of Muscatel and you have trouble picking up the fainter deep sky objects; keep drinking, and buy a bigger telescope.

MYTH #2: BIGGER IS BETTER

This is sometimes referred to as

"aperture fever". Aperture fever, I'm here to tell you, is a myth. It was invented on July 31, 1973, by a man named Fred Griffith who, at the time owned a 400 foot long, 36 inch aperture refractor designed especially for the Mars opposition of that year. It was a magnificent looking telescope, made entirely of brass but completely useless since Griffith was unaware of the fact that you have to use an eyepiece to see anything. Looking into the empty star diagonal, Griffith saw a huge featureless blob of light and concluded that his objective wasn't big enough. He's currently working on a 102 inch Dobsonian mounted on Teflon bearings the size of ferris wheels, but still doesn't own any eyepieces and none of his friends is willing to tell him about them and spoil the fun.

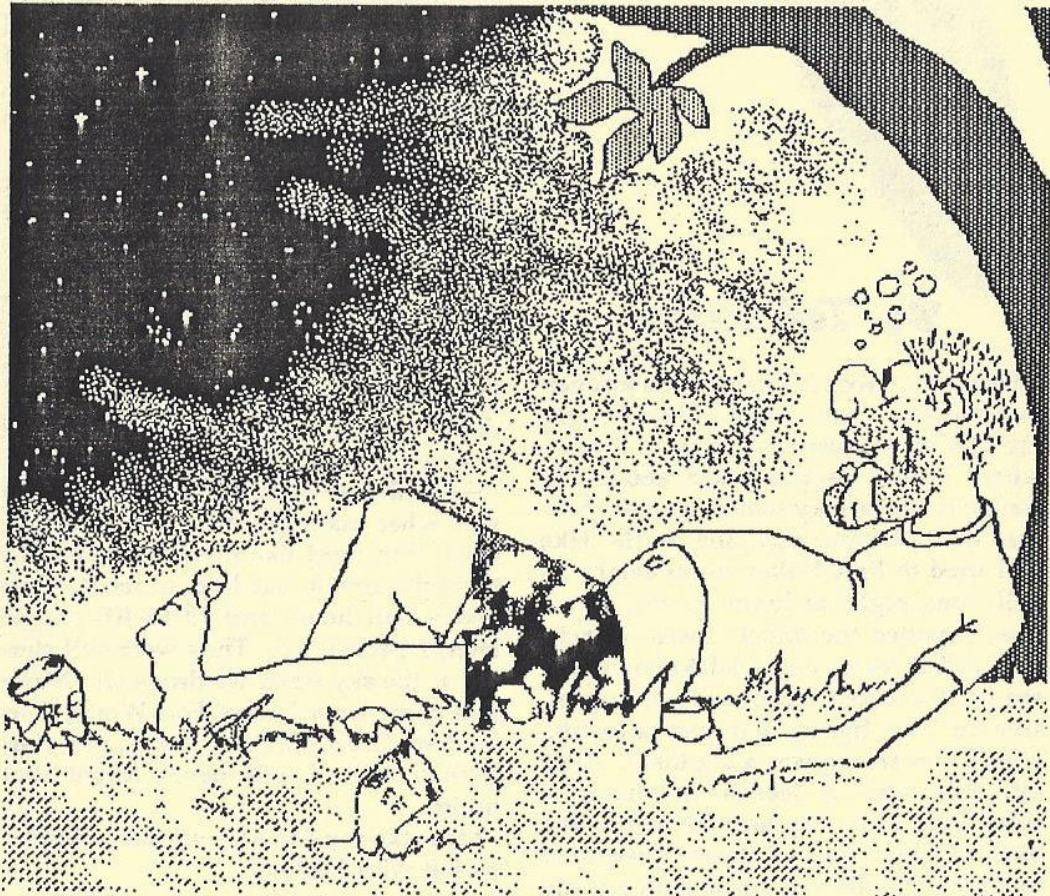
If Fred Griffith's story isn't enough to convince you that aperture fever is a myth, consider the fact that I personally have had my very best views with a 3/4 inch objective spy glass made in Portugal (the company, in an obvious ploy to garner business from people who don't read ads too closely, like me, is called Schmead)—but since you don't have my neighbors, who leave the shades open

every night around ten, you might not have the same luck.

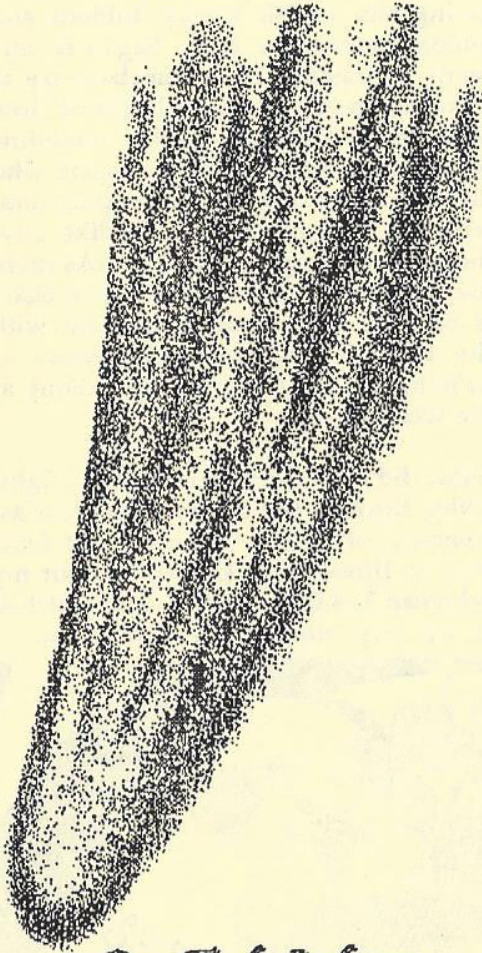
MYTH# 3: CARL SAGAN IS A WIMP

This is an easy myth to bust. Anyone who saw the Carl Sagan-Boom Boom Mancini fight of August 22, 1986 will know that Sagan looked like a true champ until the eighth round, when Mancini knocked all his teeth out, rendering him unable to say "billions and billions" without a lisp. Sagan is currently in training for a comeback try at Mike Tyson (the match to be billed "Iron Mike vs. Cadmium Carl") sometime soon after the Spinks fight. Sagan, who has ballooned up to 205 pounds and, with his lack of teeth looks like anything but a wimp—in fact, he looks more like Marlon Brando than anything else—is pushing for a date concurrent with the Pioneer Neptune rendezvous so he'll have something to talk about at the weigh-in.

How did I see the Sagan--Mancini fight? Why, through the magic of amateur astronomy, of course. I merely had fourteen or fifteen Bud Lights, got out my Schmead 3/4 inch refractor and watched it on my neighbor's television.



THE COMET HALLEY: A REMBERANCE



By Ted Inlow

It was December 1985 and I was just getting started in astronomy. I had bought my C-8 in August of that year. Everywhere I went people talked about this comet; it was a very famous comet. Several times I went camping at the lake and tried to find Halley to no avail. Finally one night at home in my driveway, I spotted the comet. I was so excited I called Mom and Dad to come and see it. The comet itself was not impressive in city lights, but just knowing what I was seeing was a big thrill. After all, this was a lesson in history--something that was around before the birth of Christ and all through recorded history. Chills ran up and down my

spine.

Late in December just before Christmas, my dad died. It was a very rough time in my life. My whole family was in pieces. A week after we said goodbye to Dad, I decided something was needed to relax and calm everyone down, myself included. Here it was, the Saturday after Christmas and I heard there were some good views of the comet just after sunset in the west. I called by sister and brother in law, got my wife and Mom. We loaded the telescope and started down towards the Pate Museum. There had been talk of a star party. When we got there, we were not alone. Another car had gotten there first. No one but us was around. Two men in suits got out and asked what happened to the party. I didn't know, but we were going to set up the scope and look at the comet. They had binoculars. Just as I was putting my scope on the wedge, some men drove up in a truck and said that we had to leave, the show was cancelled.

It was a perfect night, crystal clear. What a waste. But wait just a minute, we will find somewhere else to go. The men in the other car followed. I drove just a little further until this little dirt road took off towards the west. About two miles later on a slight hill with farm land all around us, this was it. I parked the car on the shoulder and set up my telescope in the road. No traffic. Nobody but us and the two men. We got together and found the comet.

Halley was a fantastic sight, glowing coma and a good distinct tail. Someone must have had a CB or something, because in less than an hour, cars were everywhere, lined up on both sides of the road. Suddenly, people started to gather behind my scope. One by one they gazed at the comet; kids, moms, dads, grandparents. Some children had to be picked up to see in the eyepiece.

If you live to be 80, you will see it again was what many parents told their children. For most like myself, it would be the only time in our lives to see it. Two and a half hours and 75 to 100 people later, I packed up. They were still staring at the sky when we drove off. Many had come from Dallas, Fort Worth, Garland or Grand Prairie, just to see Halley's Comet. I will never forget that night.

I felt like my dad was up there. Maybe he left with Halley's.



KIDSTAR: Our Sun

By Becky Nordeen

It's spring and the days are getting longer. This means less skywatching time at night. In the summer, it won't get dark until 9:30 pm. What can we do with all this daylight? We can observe the closest star to earth, our own sun.

People have been studying the sun since the earliest written records. Archaeological evidence shows the sun even concerned people who left no written records.

The ruins of Stonehenge in England are aligned with the sun and the moon. Scientists believe Stonehenge was used to study eclipses as long ago as 2300 B.C. The Maya of Central America built large temples a thousand years ago. The Temple of Inscriptions at Palenque is aligned with the sun on the shortest day of the year.

In our own Southwest, the Anasazi left many rock inscriptions believed to be eclipse and solstice predictors. These 700 year old carvings can still be seen in Utah and New Mexico.

People have always held a special place for the sun because it is the sun which makes life possible on earth. Yet it has only been in modern times that we have really come to understand the sun as another of the points of light we see in the night sky.

The sun's diameter is 860,000 miles; 1,300,000 earths would fit inside the sun.

The sun weighs the same as 330,000 earths, yet the sun is mostly nothing. It is a burning ball of gas, mostly hydrogen and helium. The outer layers of the sun are only as thick as the air we breathe. Halfway to the center the sun becomes as dense as water.

The sun is about 4.5 billion years old. The earth began to form before the sun began to burn. The temperature on the surface of the sun is about 11,000 degrees. Inside it is much hotter. Sunspots are large magnetic storms on the sun's surface. Some are as large as 55,000 miles across. They appear dark because they

are cooler, about 6000 degrees.

The sun accounts for some of the most interesting and easily seen events of our everyday lives. Rainbows, glories, halos, sun dogs and the green flash are made by the sun.

Rainbows form when the light passes through water drops and is broken into the colors of the spectrum. Single rainbows have red on the outside. Sometimes two rainbows are made, one with red on the outside and one with red on the inside. Most rainbows are big arcs of color, but if things are just right, you can see a rainbow that is more than a half circle.

Glories are made when the shadow of an object is cast onto clouds and surrounded by a rainbow. They are usually seen from airplanes when the shadow of the plane is cast upon the clouds. Pilots have the best chance to see a glory, so it is often called the "pilot's bow".

On cloudy days a halo around the sun called a corona can be seen. These coronas are also seen around the moon when ice crystals refract moonlight. Next to rainbows, coronas are seen by the most people.

On rare occasions, settling ice crystals will project sunlight to each side of the sun, making three "suns" in the sky. These extras are called sun dogs.

The green flash is the best of all. Just as the sun sets (or rises) the top of the disk will flash a brilliant green. To see the green flash, you have to have a true horizon, the ocean or desert is best. You must also have just the right atmospheric conditions. Hot air over land or water makes the conditions likely. Scottish legend says the green flash will banish all errors in things of the heart for anyone lucky enough to glimpse this rare event.

On Astronomy Day, we will be able to look through a telescope with a solar filter and look at the surface of the sun, but don't wait till then to begin your solar observations. Rainbows, glories and the sun dogs make keeping track of the sun fun. Just remember that it is unsafe to look directly at the sun without the proper filters. This is important; unprotected observation can permanently damage your eyes.

Geo. W. Proctor

Thru A Cat's Eye: The Other Magazines

Before Lana and I brought our first telescope, we subscribed to the magazines for years. The "magazines" being *Astronomy* and *Sky and Telescope*, as well as a smaller publication called *Deep Sky*.

It seemed like the natural thing to do since both of us were interested in astronomy. Not only were the articles informative and the photographs beautiful, but there were the advertisements. How I loved and still love the advertisements. It's easy to dream away a cloudy evening just browsing through those ads mentally building the perfect outfit after the perfect outfit.

To my surprise when we joined FWAS three years ago, I discovered that many members subscribed to only one of the two major astronomy publications and very few had even heard of *Deep Sky*, let alone seen a copy. At first I thought this might have something with FWAS members having access to telescopes. After all, who needs photographs when one can actually gaze upon the objects described in the magazines.

Time has proven that assumption wrong. Three years have passed and the situation remains the same. The reason, I believe, is that the majority of FWAS members simply haven't been exposed to the other magazines out there.

This time around, I thought I'd eat up the space for this column by introducing you to four other magazines that arrive at our house via the mailbox.

Of the three newsstand distributed astronomy magazines, my personal favorite is *Deep Sky*. In fact, it stands at the top of the heap for all the astronomy-related magazines we receive and has done so since the first issue the mailman brought.

Deep Sky makes no attempt to compete with either *Astronomy* or *Sky and Telescope* in the scope of its columns and features. If anything, it is far more oriented to the amateur astronomer than either of the other two, offering fairly in depth coverage on the topics it takes on. Such articles as a listing of

summer planetary nebulae for amateurs to try for published about a year ago come immediately to mind when I think of *Deep Sky*.

A look at the table of contents in the latest issue will give you a good idea of what to expect from this publication: The Galaxies of Canes Venatici, Pushing to the Limit: The Palomar Clusters from Your Backyard, and Observing the Centaurus Galaxy Cluster. Regular columns include one on double stars and variable stars. Also note that articles are usually accompanied by a generous helping of excellent photographs as well as eye-piece impressions drawn by contributors. One drawback to some might be the fact that *Deep Sky* is totally a black and white publication. Don't let that hold you back. The photographs and drawings are top notch. This is a slick production published by AstroMedia, the same folks who publish *Astronomy*.

Occasionally *Deep Sky* can be found on the magazine racks of such bookstores as Walden's and B. Dalton's at a price tag of \$2.95. It's a thin magazine published on a quarterly basis, but because of the information it provides for through the scope viewing, I feel that it is more than worth the three and change (remember tax) you'll pay.

Subscriptions run \$12 a year and should be sent to *Deep Sky*, 1027 North Seventh Street, Milwaukee, WI 53233-9972. AstroMedia has just offered their publications to groups at a reduced rate. FWAS might want to take a look at this and offer it to members.

Just about a year ago I noticed an ad in *Sky and Telescope* for a new publication soon to be distributed via the mail. That ad offered a two-year subscription for only \$9. I bit and sent in my check. Those nine dollars just might have been the biggest bargain in the price-inflated world of amateur astronomy. They went for a publication called *The Observer's Guide*.

In the seven issues published of *The Observer's Guide*, it has come to rank right up there with *Deep Sky* for my favorite. It has one big plus--it's published six times a year rather than four.

Unlike the other magazines mentioned, this publication takes a unique approach to astronomy--each issue explores the objects to be found in either one or two constellations. Nor is this a

slipshod job. It's a magazine that's meant to accompany the amateur when he goes out into the field to view or photograph--thus it comes with three holes already punched along the spine so that it can be easily slipped into a notebook (Great idea, but there are book and magazine collectors like myself who would never consider performing such an actrocity).

So what's *The Observer's Guide* got inside its covers? Star charts, photographs, and eyepiece impressions all designed to help the amateur astronomer find the whole slew of objects that are listed in each issue. And I'm not just talking general charts, but detailed insets making it easy for starhoppers as well as those that prefer the use of setting circles or computer. I'm not a starhopper, but I tried these charts out in my front yard and they are very useable. Also included is a verbal description of each object listed for the constellation being covered that issue. And the objects are more than just galaxies, nebulae, and clusters. *The Observer's Guide* also includes listings for double and variable stars.

To be honest, there's usually enough information in each issue to keep most FWAS members busy for the two months between issues.

Constellations covered in the first seven issues are:

Canes Venatici
Ophiuchus and Serpens Cauda
Sagittarius
Cygnus
Columba and Taurus
Orion
Leo

The Observer's Guide is published bi-monthly by Astro Cards, P.O. Box 35, Natrona Heights, PA 15065. The present subscription rate is \$12.00 a year. Astro Cards is also offering a discounted subscription rate to astronomy organizations. FWAS might also look into this.

One last note. As of the most recent issue, all back issues of *The Observer's Guide* are presently available. I highly recommend this magazine--what else can I say?

An ad in *Sky and Telescope* also brought out the check book for a trial subscription to *The Astrograph*, a small publication dedicated to astrophotography. To be honest, when I first consid-

ered doing this column back in the summer, I was going to pan this publication. In truth, I let my subscription expire. However, this month I found myself missing *The Astrograph* and reupped for another year. At a rate of \$9 a year, it wasn't a painful experience.

Published bi-monthly by Astrograph, Post Office Box 2282, Arlington, Virginia 22202, *The Astrograph* appears to be a labor of love by its editor Robert C. Price. I can only describe it as an amateur magazine devoted to that astronomical misfit, the astrophotographer (amateur is not a put down, but any magazine that uses typewriter print for photo cutlines does have an amateur appearance). Or more precisely, astrophotographs, of which there tend to be around two dozen--all in black and white. In other words, this publication is a showcase for photos sent in by readers.

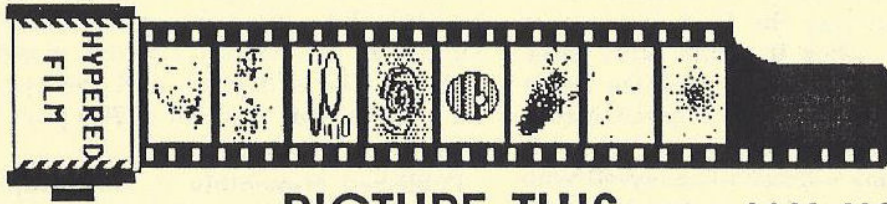
There are articles in *The Astrograph*, but I have found them to be of little significance when compared to the astrophotography articles in *Astronomy*, *Sky and Telescope*, and *Deep Sky*. This is disappointing, since *The Astrograph* seems to be a ready-made forum for astrophotographers to exchange information.

If you're an astrophotographer, you might give *The Astrograph* a try, but be forewarned that you may find it disappointing. On the other hand, you might discover, as I did, that you enjoy receiving this little ditty in the mail every other month.

The last magazine I'd like to mention is *Telescope Making*, which is also published by AstroMedia. This one I subscribed to in an attempt to help out my wife's students with their annual magazine subscription drive, which is an indication of my interest in amateur telescope making.

To my surprise, I find myself reading several of the articles in each issues, especially those concerning domes and gatherings of amateur astronomers. The trouble this magazine seems to have is a sporadic publication schedule at best although it's suppose to be quarterly. Again AstroMedia offers reduced rates for organizations.

While none of the magazines mentioned are replacements for the two major publications, all can add to the enjoyment of this hobby we share.



PICTURE THIS by JAY HORNSBY

"It's duck season!"

"It's rabbit season!"

And on goes the argument between two of the looniest cartoon characters to ever be electromagnetically scanned across the fluorescent surface of a TV.

If Bugs and Daffy only knew it was Spring, they would have to agree that it is really galaxy season. Spring brings open sky, unobscured vision deep into the universe; sky area that is well away from the dense star fields, dust clouds and diffuse nebulae of our own galaxy. Most everyone knows that galaxies are far away. What some fail to understand or comprehend though, is that what we see or photograph now is actually a very long time ago. A camera capturing a galaxy is pretty close to a true time machine.

During the next two months our cameras will be frequently pointing at galaxies. They are tough objects, our guiding times and patience will be pushed to the limit, but our persistence can reveal the past...it's impressive. Galaxies are the hardest of all deep sky objects to shoot, but shoot them we must. It's galaxy season!

OBJECT 1 M44 A galactic cluster in Cancer is an easy target for our first shot. Galileo wrote about this object back in 1610, after viewing it in his rather primitive telescope..."the nebula called Praesepe, which is not only one star, but a mass of more than 40 small stars." Even today this is still a good description of M44. Actually, about 75 relatively bright stars are easily seen within 11/2 degrees of arc with today's amateur telescopes. Using this sky area as a guide, a lens of 500mm to 1000mm will cover this coarse cluster and its bright stars will reveal their many colors, even with a short exposure.

OBJECT 2 M81 and M82 Photographing galaxies is the most challenging of all the deep sky objects. Typically they are small, very faint and hard to resolve with the equipment available to most

amateurs. Only a few out of the thousands possible to photograph make as spectacular a photo as do these two when both are captured in one frame. M81 is an almost face on spiral that covers 21 by 10 minutes of arc. M82 is a very colorful irregular, seen more edge on, covering about 9 by 4 minutes of arc. These two contrasting galaxies are only 30 minutes apart, making them easy to fit into one frame, even at long focal lengths. They are also bright enough (M81, 7.1 magnitude and M82, 8.8 magnitude) to be seen in most viewfinders, helping make this shot a snap. A 1000mm to 2000mm lens can fit both objects into one frame but they need to span diagonally across the film frame to fit at the 2000mm focal length.

OBJECT 3 M97 The name "Owl Nebula" describes this planetary located in Ursa Major well enough. The two dark areas that become the "owl's eyes" are visually very hard to see; one using a UHC filter under a dark sky finds them a test of vision. Using hypered film and employing the same filter during the exposure makes recording this nebula and the two eyes much easier than imagined. M97 is fairly large for a planetary, about three minutes in diameter. Anyone who gives a hoot can shoot the "Owl" with a 2000mm to 4000mm lens; just don't tell the National Audubon Society!

OBJECT 4 M95, M96 and M105 These three galaxies all lie within two degrees of sky. This photograph will be composed of small but interesting objects. Photographed as units or a cluster, these objects make nice subjects when they are close together in the sky. M96 is 6 by 4 minutes of arc and is flanked by M95 (about 3 minutes across) located 30 minutes to the east and M105 (2 minutes across) located 30 minutes to the north. Other, although fainter, galaxies are in this immediate area and might be revealed on film, especially Tech Pan 2415. Proper lens size for this group photo

ASTROPHOTOGRAPHY OBJECT TABLES

| OBJECT | FILM | f/1.4 | f/2 | f/2.8 | f/4 | f/5.6 | f/8 | f/11 | PHOTO NOTES |
|-----------------------|------|--------|--------|--------|--------|-------|-----|------|-------------|
| M 44 | 3200 | 4 sec | 8 sec | 15 sec | 30 sec | 1 | 2 | 4 | fx 31 |
| 8h 37.5m +19 52' | 400 | 25 sec | 50 sec | 1.6 | 3 | 6 | 12 | 25 | |
| | 2415 | 1 | 2 | 4 | 8 | 15 | 30 | 60 | |
| M 81 M 82 | 3200 | 15 sec | 30 sec | 1 | 2 | 4 | 8 | 15 | fx 33 |
| 9h 51.7m + 69 38' | 400 | 1.6 | 3 | 6 | 12 | 25 | 50 | 100 | |
| | 2415 | 4 | 8 | 15 | 30 | 60 | 120 | -- | |
| M 97 | 3200 | 30 sec | 1 | 2 | 4 | 8 | 15 | 30 | fx 34 |
| 11h 12.0m + 55 18' | 400 | 3 | 6 | 12 | 25 | 50 | 100 | -- | |
| | 2415 | 8 | 15 | 30 | 60 | 120 | -- | -- | |
| M95-96-10 | 3200 | 30 sec | 1 | 2 | 4 | 8 | 15 | 30 | fx 34 |
| 10h 41.9m + 12 15' | 400 | 3 | 6 | 12 | 25 | 50 | 100 | -- | |
| | 2415 | 8 | 15 | 30 | 60 | 120 | -- | -- | |
| M 105 Tr1D | 3200 | 30 sec | 1 | 2 | 4 | 8 | 15 | 30 | fx 34 |
| 10h 45.5m + 12 51' | 400 | 3 | 6 | 12 | 25 | 50 | 100 | -- | |
| | 2415 | 8 | 15 | 30 | 60 | 120 | -- | -- | |

should be a 500mm to 1000mm lens.

OBJECT 5 M105, NGC3384 and NGC3389 The previous photo may have revealed two companions, both within a few minutes of M105. Using a longer focal length and bigger aperture this distant trio can be resolved into three distinct types of galaxies. M105,

the brightest, will resolve into a type E1 galaxy (a very slight elliptical). NGC3384, almost equally bright, appears as an E7 (the most elliptical) galaxy and NGC3389, the dimmest, becomes a most impressive type Sc galaxy (highly balanced, well defined spiral). A magnificent photo can be made of this trio with patience and a 2000mm to 4000mm lens.

DEEP SKY by Bob Newman

This month the weather is much improved and we can look forward to being able to stay outside for most of the night. April provides warmer evenings and most bugs have not yet discovered how good humans taste. How quick they will learn!

Speaking of bugs, last summer we discovered that Avon's Skin-So-Soft bath oil, spread with the hands over all exposed skin areas, works as an excellent bug repellent. Leave those sprays that make you smell like a chemical factory at home. Also, the sprays are bad about overflowing into everybody's mirrors and lenses. Besides being less expensive, SSS smells a lot better and is not greasy.

NGC2419 (7h35m +39d00m) is located in the constellation Lynx, about seven degrees due north from Castor in Gemini. This globular cluster is a small (2') object with a magnitude of 11.5. You won't mistake this object for any other globular because there is not another globular within 60 degrees of NGC2419. Located 182,000 light years from the Sun, this globular has been labeled an "Intergalactic Wanderer". Although appearing very small, NGC2419 has a diameter of 380 light years and is moving away from us at 12 miles per second.

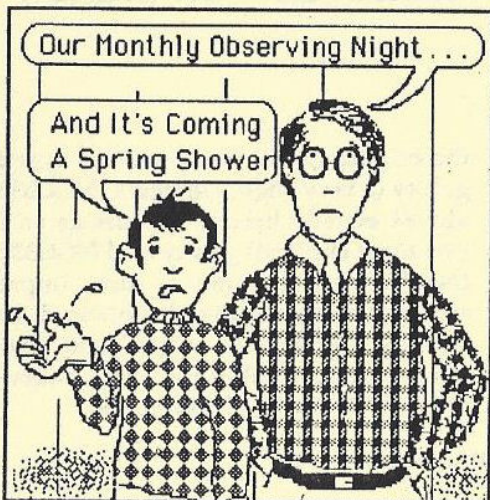
About eleven degrees north northwest of Arcturus, in the constellation Canes Venatici, is a globular cluster of another sort. M3 (13d40m +28d38m) is one of the most impressive globulars in the northern skies. With a magnitude of 6, M3 has a diameter of 18', almost one third of a degree, and can begin to be re-

solved with a four inch telescope. This globular is only 220 light years across, but M3 is more than five times closer than NGC2419. M3 is thought to be 10 billion years old, making it one of the oldest globulars known. If you find that M3 is not very spectacular when you first find it, then you are probably looking at NGC5466 in Bootes, just three degrees east of M3, an object only one third the size of M3. M3 compares with M13 and M5 in stature.

If you have a red filter and a UHC filter, you'll be able to see black holes. Just stack the red on the back of the UHC as I did one night to get a better view of Orion. I thought if Orion was red in pictures, I'd just make it visually red with a filter. Add a UHC filter to give the nebula more contrast and, presto! Black hole! Everything in the telescope was black! I had a 10 inch black hole. All kinds of weird things happen when you start mixing all of the available filters.

Swing your telescope around to the Big Dipper. From Beta, the bottom star at the outside of the dipper bowl, look one and one half degrees southeast for M97, the Owl Nebula (11h12m +55d18m). On a good night M97 just leaps out at you, while on other nights you'll need a deep sky or UHC filter to see it well. The cold night of the January FWAS meeting was so clear M97 did not need a filter at all. There was virtually no difference with a filter added. It is 150" in diameter with a magnitude of 11. This planetary has a 14th magnitude central star, difficult to locate because the glow of the nebula is pretty evenly spread across the circle. Look for the darker

THE STARS, A. T. KNIGHT



Proctor 3/88

spots where the "eyes" are. The central star is on the bridge between the "eyes." A favorite of most astronomers, the Owl also "stares" at the sky all night.

While in the Big Dipper area, carefully scan the interior of the bowl for galaxies.

Uranometria 2000.0 shows 65 galaxies inside the bowl of the Dipper. Some of these are obviously very dim, but many can be seen with larger amateur instruments. How many can you make out?

I discovered a "comet" just south of the Owl in June of '87. A smudge showed up on a photo of the area taken on the 13th. Another photo taken a week later showed a streak in the sky. Still another photo showed a smudge another week later. Scaled out on a sky chart, the smudges were connected with a straight line through all three points and a course was plotted across Ursa Major. Well, the smudges turned out to be smudges and the streak turned out to be a scratch on the print, but I had a terrific time while it lasted. The lots are still on my sky chart, reminding me of my "comet" every time I turn to chart number three.

Way off the the southeast, along about 11:00 pm, Spica (13h23m 10d54m), shining at first magnitude, about 50 degrees above the horizon, is the starting point for a journey south. West southwest of Spica, eleven degrees and five degrees north northeast of Delta and Eta Corvi (a bright optical multiple star system) is the famous Sombrero Galaxy. M104 (12h37m -11d21m) is a fine edge-on galaxy with a magnitude of 8.2 and a size of 7' by 1.5'. On a dark night, a very dark band can be seen in a 10 inch telescope bisecting the bright nucleus. This galaxy is easy to find because it is so bright. Just scan the area northeast of

Corvus for a few minutes and M104 will be readily visible.

Nineteen degrees south of Spica lies another 8th magnitude galaxy, M83 (13h43m -29d37m). At 10' by 8', M83 is a large object and is one of the 25 brightest galaxies in the sky. M83 is a face-on spiral with very thick arms and splotches of both dark spots and star clouds. A very large portion of the face-on area of the galaxy is very bright, not widely spread out like M33 or M101. M83 is thought to be 10 million light years away from us and has a diameter of 30,000 light years, making it only one third the size of the Milky Way.

Another thirteen degrees south brings us to another bright galaxy with a 7.2 magnitude. NGC5128 (13h22m -42d45m) is also 10' by 8'. This is a peculiar galaxy with a dark band across the face some astronomers think this is actually two galaxies in collision. NGC5128 has the appearance of an elliptical, but has the dust clouds of a spiral. NGC5128 is the source of the radio radiation known as "Centaurus A".

Once thought to be only 6.8 million light years away, NGC5128 cannot be resolved into any stars with the 200 inch telescope. It is now thought to have a distance of 15 million light years. Located low in the southern skies, we must look through a lot of atmosphere to see NGC5128 but it is still a bright object.

If you have a Telrad viewer on your telescope, move your telescope so the outer red ring in the viewer is located completely due south of NGC5128.

Now look just south of the bottom of the ring for Omega Centauri, four and
SLEW To Page 19

Geo. W. Proctor





SKYWATCH

BY

KAYE HUTCHINS

April 1-April 30

Fri, April 1 Venus sets at 10:34 CST. Mars rises at 2:37 CST. Jupiter sets at 8:33 CST. Saturn rises at 12:57 CST.

Sat, April 2 The full moon nearest the March equinox is called the Grass Moon or Egg Moon. At the equinox, both the sun and moon cut the celestial equator in half hence both spend 12 hours in the sky. When the sun sets, the moon rises and vice versa. Due to the moon's steep descent along the ecliptic, it rises about an hour later each night for the northern latitudes.

Sun, April 3 Remember, U. S. Congress played with the clocks again back in 1986, so change yours forward for the start of daylight savings time. It used to change on the last Sunday in April. Easter Day. 7 U.T. An occultation between the moon and Spica will be visible from the south Pacific, Antarctica and the extremesouth of South America. The moon will pass within .7 degrees south of Spica. 8 U.T. Venus is 45.9 degrees from the sun, its greatest elongation east at magnitude -4.3.

Mon, April 4 The Kappa Serpentids meteors will offer no more than one per hour travelling at a medium speed of 45 km/sec. There is no definite peak, but generally occur between April 1 and 7. The radiant is east of Serpentis at 15h20m +18 degrees rising at 8 p.m., highest at 2 a.m. Mercury will be at its greatest latitude (-7 degrees) south of the ecliptic at 14 U.T. Five hours later, Uranus will begin its retrograde (westward) motion.

Wed, April 6 At 20 U.T. the moon will occult Antares. These two will appear within a half degree of each other for those folks in southeast Africa, Madagascar, the Indian Ocean, Antarctica, south Tasmania and New Zealand.

Thu, April 7 The Delta Draconid meteor shower will be about as exciting as was the Kappa Serpentids a few days

earlier.

These, too, have no definite peak and will only produce one per hour. The radiant is in the sky all night at 18h45m +68 degrees near Nodus Secundus. These are slow meteors at only 27 km/sec.

Fri, April 8 The moon passes 5 degrees south of Uranus at 10 U.T. and 6 degrees south of Saturn at 13 U.T.

Sat, April 9 The moon continues passing planets as it moves 6 degrees south of Neptune at 1 U.T. 19:21 U.T. The moon is at last quarter.

Sun, April 10 Mars is the moon's next stop as it passes 3 degrees south at 15 U.T.

Mon, April 11 Both Saturn and Neptune are stationary in right ascension before beginning their retrograde (westward) motion. Venus sets at 10:47 CST. Mars rises at 2:21 CST. Jupiter sets at 8:05 CST. Saturn rises at 12:18 CST.

Tue, April 12 Yuri Gagarin became the first human in space on this day in 1961. He circled the earth for 108 minutes. Birthday of Christiaan Huygens (1629-1695). He was the first to give a true explanation of Saturn's rings in 1655. A full account of this discovery was published by Huygens in 1659. Galileo saw the rings as early as 1610; but did not recognize the rings for what they really were. With about 20 radiants, the Virginid meteors seem to come from all over the Virgo region from early February into April. This does not, however, mean they will be abundant! We can only expect about one per hour emanating from the two most prominent radiants at 14h04m - 9 degrees and 13h36m - 11 degrees.

Wed, April 13 At a distance of 57.1 earth-radii, the earth is at perigee.

Thu, April 14 The moon is at its ascending node at 4 U.T. Five hours later, Ve-

nus will be at its greatest latitude (3.39 degrees) north of the ecliptic.

Fri, April 15 Venus will be 10 degrees north of Aldebaran. Both will appear about 45 degrees from the sun in the evening sky at magnitudes -4.4 and +0.9. The April fireballs are bright meteors which sometimes reach the earth as meteorites. This stream is annual, but sparse and irregular. The radiant is not defined. They will appear in the regions of Capricornus, Aquarius and Pegasus from the ecliptic to the equator.

Sat, April 16 New moon.

Sun, April 17 One meteor per hour is all we may expect from the Sigma Leonids which peak (peak?) on this day. Their radiant is in central Virgo at 13h0m -5 degrees. These will be slow at 20 km/sec.

Wed, April 20 Our northern neighbors in Siberia, the Arctic circle, Greenland and Iceland will enjoy an occultation between the moon and Venus. The moon passes 1 degree north of Venus. Mercury will be in superior conjunction with the sun as it moves into the evening sky.

Thu, April 21 The Lyrid meteor shower is the earliest recorded shower of all major showers now known. Chinese records show it as early as 687 B.C. It is derived from Comet Thatcher which has a period of 415 years. Most of the appearances have been minor, but records indicate that there may be Lyrid storms every 60 years. In 1981 and 1982, there was a huge increase with rates from 75 per hour up to 250 per hour within a few minutes. This year, however, the peak will be in the day for our country. Our best chance will be in the pre-dawn hours of the 21st and 22nd after the first quarter moon sets at midnight. Even though this year is not expected to be very exciting, these are medium in speed and many will produce bright, lingering streaks. The radiant is on the Hercules-Lyra border at 18h08m + 32 degrees. Venus sets at 10:53 CST. Mars rises at 2:03 CST. Jupiter sets at 7:38 CST. Saturn rises at 11:34 CST.

Sat, April 23 Mercury is at its ascending node through the ecliptic. At 15 U.T., the moon will pass .9 degrees south of Vesta for another occultation which we

will be able to see. On this date, the moon will be at first quarter. Comet Grigg-Skjellerup has the second shortest period of all comets at only 5 years. With it we get the Pi Puppids or Grigg-Skjellerup meteors. The comet came close to the earth in 1977 and 1982 and rates up to 38 per hour were recorded. The comet was at perihelion in 1987 and moving away from us. This year will be sparse to non-existent. The radiant is in southern Puppis at 7h48m -45 degrees.

Mon, April 25 The moon is at apogee at a distance of 63.4 earth-radii. April seems to have meteor showers only producing one per hour and the Mu Virginids are no exception. Peaking on this day, their radiant is 14h44m - 5 degrees. They are slow at 29 km/sec.

Thu, April 28 The moon is at descending node and Mercury is at perihelion. Near Arcturus is the radiant (14h30m +19 degrees) of the Alpha Bootid meteors producing (you guessed it!) one per hour. These are slow at 20-23 km/sec.

Sat, April 30 Today is one of the cross-quarter days. These are exactly halfway between the equinoxes. Visible only from the Indian Ocean, west Australia and Antarctica, the moon will pass 7 degrees south of Spica for an occultation.

DEEP SKY Continued From Page 17
one half degrees south of NGC5128, the largest globular cluster in the sky. At 13h24m -47d13m, Omega (NGC5139) is frequently blocked from view by trees, houses, trucks and cats. Located 36 degrees south of Spica, Omega is easily spotted with binoculars if you have a view of the southern horizon. Just go outside, look to the south and wave your binoculars around low in the southern sky. It's the only object in the sky you can't mistake for something else. With a magnitude of 4 and a size of 30', Omega is 17,000 light years away.

I have low trees fifty yards to the south of my normal viewing spot in the front yard, and one of the farm cats will occasionally be climbing around in the tops of those trees late at night. It's startling to look into a cat's eyes with Omega Centauri in the background. Moving to the backyard gives me a view right down to the southern horizon and it's surprising how high in the sky Omega is with a view all the way to the horizon.

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