

Desert Skies

February, 1994

The Newsletter of the Tucson Amateur Astronomy Association (TAAA)



GENERAL MEETING - Friday, February 4, 7:30 pm at the NEW Steward Observatory Auditorium - room N210. February's speaker is Matt Cheselka, who will be talking about "White Dwarf Stars".

6:45 pm - pre-meeting "Beginners lecture" by Teresa Lappin will be "Natural Skyglow" All are welcome! ("old" Steward obs. room 204). See enclosed map for directions!

EXECUTIVE MEETING - Thursday, February 10th, 7:30 pm at Flandrau Science Center's Conference Room

30" TELESCOPE DESIGN, LAND & FUNDRAISING MEETING - Wednesday, February 16, 7:30 pm Location to be announced - call Dean.

STAR PARTIES: January 29 - Public Star Party at Whipple Observatory Base Camp.
February 5th, 12th - Star Party at Empire Ranch - see enclosed map.
February 12th - Public Star Party at Gilbert Ray Campground.

OTHER EVENTS: February 2nd - 6.5 meter mirror casting at Mirror Lab - see enclosed article.
February 19th - Polar alignment workshop at the home of Gary Rosenbaum.

Next Newsletter Deadline - February 16

COVER: After screening the John Dobson telescope-making video January 14, members were given a tour of the Mirror Lab. They are shown standing on the polishing cell of the MMT 6.5 meter mirror, which is visible in the distance (covered). **Back Cover** - Observers line up to look at the moon through Dean's 20X120 binoculars at the public star party held at Sabino Canyon on January 15th. Photos by Dean Ketelsen.

TAAA EXECUTIVE

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MEMBERSHIP IN THE TAAA

Individual	\$20.00/year
Family	\$25.00/year
Senior Citizen (over 60)	\$18.00/year

Sky & Telescope subscription (optional) \$20.00 (as of July, 1992)

Rates for membership in the TAAA are given above. Members may subscribe to Sky & Telescope at the time membership renewal, saving more than 25% off the cost of a regular subscription. The subscription term must match your membership period.

Send one check, made payable to: Tucson Amateur Astronomy Association, to cover both membership and subscription to: TAAA, PO Box 41254, Tucson, AZ 85717. It is best to pay your dues 2-3 months before your membership actually expires.

Desert Skies Publishing Guidelines

- * All articles, announcements, news, etc. must be submitted by the newsletter deadline listed above. Materials received after that date will appear in the next issue.
- * All submissions are retained by the editor unless prior arrangements are made.
- * Partial page article submissions should be submitted on Wordperfect compatible files on a floppy. Full page articles, artwork, and photos should be camera ready.
- * We will not publish slanderous or libelous material

Send articles, announcements, etc. to:
TAAA - Desert Skies
PO Box 41254
Tucson, AZ 85717

Send ADDRESS CHANGES to:
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Attention: "address change"
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4 EASY STEPS TO MEMBERSHIP RENEWAL

1. Pay your dues 2-3 months early. Your month of membership expiration is listed on your newsletter mailing label.
2. a) Decide if you want Sky & Telescope, then add \$20 to your membership rate.
b) Include Sky & Telescope's renewal notice, if possible.
3. Write one check, payable to TAAA.
4. Send it to TAAA, P.O. Box 41254, Tucson, AZ 85717.

Call the Treasurer if you have any problems.

February's Featured Speaker: Matt Cheselka "White Dwarf Stars"

Matt will talk to us about the end products of stellar evolution. He has recently finished an observing program on white dwarfs and he will fill us in on current models and why it is important to observe them.

Matt is a research consultant for E. Keith Hege at Steward Observatory. The white dwarf work was done with Jay Holberg at LPL. His current work with Hege is with high angular resolution imaging and adaptive optics.

Living in Tucson for 6 years, Matt and wife Karla have been married for 2 1/2. He has been an amateur astronomer all his life with a strong interest in deep sky observing. He has used his 10" f/5.6 Dobsonian for over 10 years, is a member of the Astronomical League's Messier Club, and is about half way through the Herschel list. Words to live by: "Give me a dark sky and I'm happy."

Beginner's Lecture "Natural Skyglow"

Man-made skyglow is a concern for amateur astronomers, but did you know that there are a few sources of skyglow that can't be stopped? During this month's Beginner's Lecture Teresa will discuss this natural 'light pollution' and what causes it.

The Beginner's Lecture starts at 6:45pm, 45 minutes before the start of the regular meeting. See you at 6:45pm on February 4th in room 204.

Telescope Workshop on Polar Alignment 19 February at Gary Rosenbaum's

Equatorial Mounts are great for keeping your object centered in the eyepiece, but unless your mount is accurately aligned, high power observing or astrophotography can lead to real headaches. Gary will show a few pointers for coarse alignment for visual observing, and then cover the drift method for more accurate alignment. There will be a sign up sheet at the February meeting, or call 579-0185.

Call for Newsletter Submissions and More

The TAAA is a great amateur club, but we can do better. We need a great newsletter and more activities to appeal to the wide variety of members that we have. This newsletter would merely be a posting of functions and announcements if not for members who take the time to submit articles or anecdotes of their adventures in astronomy. Jeff Brydges' articles are an excellent example of members contributing articles that educate, promote observing, and record observations. Having these contributions make the newsletter vibrant and personalized, making it something to look forward to and not waiting in a pile for the recycling folks. No access to computer or typewriter? No problem, your dedicated newsletter editor has transcribed many a page into a computer. Mail your submissions to the newsletter editor at the Club's P.O. Box.

Similarly, the TAAA is more than a monthly meeting and starparty. There is potential for social interaction and more at "Gabfests" or informal backyard starparties, if members step forward to host them. They are really a fun time - try it! Call Dean or Teresa to talk about hosting an event at your home.

Mirror Lab Casting Set

The Steward Observatory Mirror Lab's (SOML) casting of the 6.5 meter primary for the Magellan Telescope for the Carnegie Institute has been set for **February 2nd**. The schedule calls for the oven to start heating on the 28th, reaching the glass softening point (750°C) and the oven to start spinning at 8am on February 2nd, with the glass melting through the day and reaching the high temperature of 1180°C near midnight. The mold will then be cooled rapidly during the 3rd of February.

TAAA members are welcome to witness the casting process on the 2nd. Parking permits will be available in the SOML office, under the east stands of Arizona Stadium. To attend, you **MUST** have a name tag waiting for you at the door, or you may be denied admittance. With a name tag, you can stop by any time on the 2nd between 8am and midnight. To register for this event, **call my office phone number at 621-8764**, and leave your name (make sure you spell it if it is much more difficult than Jones) and phone number on my voice mail. I will transcribe all who call to the name tag list. The deadline for registering is January 28! If you do not call by then, you may be turned down. The message at the number will also have any schedule change information if it differs from the above timetable.

-Dean Ketelsen

Land Search Continues...

For those of you who missed the January meeting, the Pozo Nuevo site we were attempting to purchase for club use was sold and became part of the Buenos Aries Preserve in December. The owners evidently would not lower their price to us and jeopardize their pending deal for the remaining 420 acres with the federal government. That sale leaves us without a frontrunner in the search for land. Remaining sites include the Trueblood property southeast of Sonoita and the BLM land with the Tucson Soaring Club west of Marana. We are hoping to have a land committee meeting before the next Exec meeting to better define our requirements for the search.

In the meantime, we will have our dark-sky star parties at the Empire Ranch north of Sonoita. The map to the site is in the rear of this newsletter. Be reminded that this is a primitive site with no power or facilities of any kind. However it is easy to get to and the skies relatively dark.

Annular Solar Eclipse May 10th

A showing of hands will be taken at the February 4th meeting to see if there is an interest in carpooling to the annular eclipse this May. If there are a lot of us, maybe we can rent a bus. The northern limit will cross near Bisbee, so this seems to be the most likely place to go. Baily's Beads are best along the edge of the path of annularity. (May 10th is a Tuesday and annularity occurs at 10am).

For those of you who will observe the 80%+ eclipse from Tucson, the Flandrau Science Center is going to organize a public observing session and are looking for volunteers to lend support and telescopes.

We can also arrange a "how to photograph" session at some time if there is interest.

The following is a result of a discussion at the 30th fundraising meeting held on 19 January. TAAA member Keith Kumm is the brainchild of the idea and feels the concept has merit due to Tucson's reputation in astronomy and the encouragement by the current administration in getting "on-line". Any interest out there?

Date: Thu, 20 Jan 94 18:27:37 MST

From: kmk@hobbes.wavelogic.com (Keith Kumm @ WaveLogic Corp)

TAAA and the "Virtual Observatory"

TAAA struggles with the club observatory project. It is more a problem of cash chasing resources than talent chasing opportunity. The club site is, in one opinion, a case of missing the threshold of investment: it is too small in scale for feasibility at our budget level.

A larger investment scale has benefits. On this larger scale is the concept of the **virtual observatory (VO)**.

The VO is a shared system with public distribution. It would use an instrument at a great site (probably an existing observatory site) and would conduct a "program". The program would be controlled to a significant extent by TAAA, and through this partial control, achieve our goals.

The VO is a "system". It has an instrument, local and remote controls, a link to a distribution agent (perhaps the UofA), and a mass media distribution channel (such as a cable TV public access channel). VO exploits technology such as CCD imaging into digital microwave or laser link back into Tucson. VO would use the most up-to-date and exciting techniques, such as image compression and automatic sequencing at the system "head", the physical observatory component. The distribution center would use standard TV and data technologies to get the products out on Jones and Tucson Cablevision. Finally, a "reverse exploitation" of the cable magnates! There would be eventual need for special, low-cost "acquisition systems" for consortium members to use in their homes to "grab images" (in real-time or "programmed ahead like the VCR). There could be special access benefits of various kinds that would make TAAA membership sought after by newcomers.

The VO system would execute programs devised by its controlling ownership. This ownership might be a consortium of TAAA, UofA, TUSD, Steward Observatory, etc. The consortium partners would split the interest/control, and bring promotion muscle to the project, attracting significant investors like public and private foundations and even the government. We would probably have to put initial investment into the project in the form of travel costs for having the consortium meet with the funding sources in places like Washington DC. We could probably get some marketing freebies along this line given the regular traffic between there and here anyway. Our representatives and Senators would love the idea.

With the prestige of multiple heavy-weight players, the consortium would market itself through the grant and proposal process to public-interest investors. The VO project would be a pioneer and a milestone for telecommunications in the public interest. It would exploit the pregnant atmosphere in Washington to "show the way" for the National Information Infrastructure. This is an idea whose time is swollen ripe.

VO programs would be observing runs, of course. They would happen in real-time at night when the public

access channels are quietest. They exploit "wasted bandwidth" in the national system. This is in sync with history, and Tucson is probably the premier community to pull this off in. This is a tremendous marketing opportunity for our club to get control of enough resources to do something very exciting.

VO programs could be leisurely tours in early morning hours. They could be hard science conducted by TUSD or UofA students and TAAA members. There could be serious amateur work most anytime. There is high probability such a program sequence would "settle down" into dominant access by the founder/designers of the system. These folks are, of course, us.

The VO system "product" would be distributed, initially for free, to everyone. What do we care if everyone benefits? The system control would be the valuable resource, and would be split up by agreement among system collaborator/owners. Because we, the TAAA, would be the founder and guiding light, we might expect to get a plurality of control time, perhaps 40-50%. We would have to share some dark nights with other sophisticated partners, however, like Steward Observatory.

The details of "where and what" are there for our club experts to address. We might build our own telescope as part of the project, but this may not be necessary if the right instrument were "handed down" to us as part of the teaming agreement of the VO Consortium. Never worry, a tremendous technical opportunity will emerge from the general activity. And the best part will be in the "fine print": "maintenance and calibration" by TAAA could provide us with all the "tech" time on the instrument and facility we ever dreamed of.

The best argument for this proposal is that it is, despite its scale and scope, quite practical if we put together a good team. If TAAA is the "glue and lightning rod", we will get a front seat at something beautiful and powerful. We will have to share it, but that is a benefit, not a loss. What better way than this to fill the club's ranks? What more enjoyable way than this to "tap into" what friends and pro's are doing with our system, from the comfort of our TVs and home computers ... waiting for our frequent turns at controlling a state-of-the-art system in our own personal programs?

The VO doesn't mar or kill any of our traditional amusements. We could still have "live" star parties where the public can "kick the tires", although the televised star party every night (can you imagine the sheer number of observing opportunities in a on-line system?) would certainly be the ultimate star party. We would still use our own equipment and imaginations to go far and wide in search of new latitudes, etc. The VO only whets the appetite!

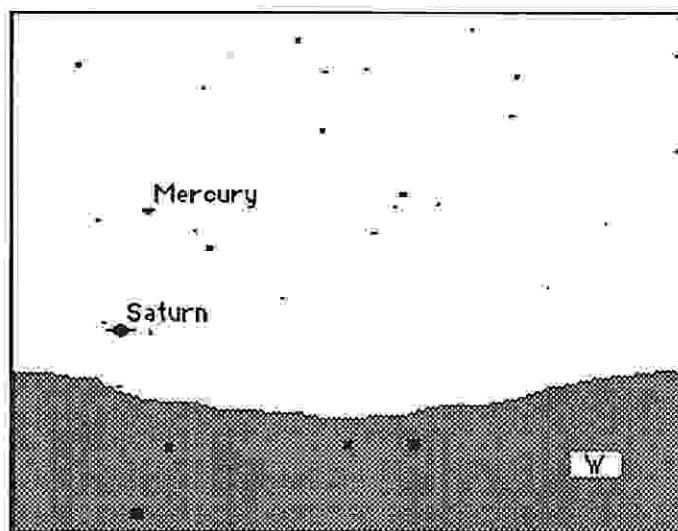
OBSERVER'S REPORT

January blessed southern Arizona stargazers with clear skies, a drastic difference from the same time last year. As a result of the clear skies (and getting the word out) the Sabino Canyon star party on Saturday January 15 was a big success. Dean estimates at least 200 of the public showed up to gawk through the many telescopes TAAA members provided. Thanks to all those who brought telescopes, we now have a nice list of possible new members to contact. The previous Saturday several club members made it out to the Empire Ranch to endure cold but clear weather (after some high clouds thinned out). Now that the Pozo Nuevo site has been sold we will be having Saturday star parties at Empire on dark of the moon weekends (unless another event is on for that night). This month there will be one Empire Ranch star party held (tentatively) on Feb. 5, the day after our monthly meeting (Remember that a public star party is set for the 12th at Gilbert Ray Campground). For those new to the club reading this newsletter the "Empire Ranch" (as TAAA members call it) is the club's unofficial dark site in the Empire mountains about 55 minutes from Tucson. It's real name is the "Empire Cienega Wildlife Conservation Area" and has proven to be the darkest site that is easy to reach, has good roads and is within a 1 hour drive from Tucson. Unfortunately the site does not have any facilities, nor can we build on it, but it offers superb dark sky viewing. If you go dress very warmly and bring some food. You'll be at 5000 feet and temperatures drop quickly into the 20's this time of year. For directions, see the map in this newsletter.

Those venturing out to a dark site early in the month will have two elusive but fascinating targets to capture: The planet Mercury and the Zodiacal light. Although you don't need a dark site to see Mercury (my first views were from the light polluted parking lot at Jones Beach State Park outside NY City), you do need a unobstructed western horizon (which Empire has). The zodiacal light on the other hand requires the darkest of skies to see easily. It is sunlight reflecting off dust

particles out in space. This dust is located in the path the planets travel (which astronomers call the "ecliptic") and so you will want to look for it in the same area Mercury will be early this month (the west-southwest), but after the planet sets. The zodiacal light will appear as a broad, cone-shaped glow about 20-30 degrees wide at its horizon base, and extending high into the sky some 60-70 degrees along the ecliptic. Look for it at end of evening twilight. Many beginning amateurs expect the zodiacal light to appear much smaller than it is, but once they broaden their view, are quite surprised how easy it is. Mercury will appear at magnitude -0.5, making it the brightest "star" visible low in the southwest 30 minutes after sunset. Below Mercury you may still glimpse the planet Saturn. The two planets pass each other on the evenings of Feb. 1st and 2nd, closing to just 1.3 degrees apart. I've added a chart below plotting these two planets for Saturday the 5th. On the chart please note that Mercury and Saturn are 11 and 6.5° above the horizon respectively. Until next time, clear skies!

Michael Terenzoni



THE SKY FROM TUCSON
LOOKING SOUTH-SOUTHWEST
FEBRUARY 5, 6:30PM

CASTOR - NOT JUST A TWIN

Rising in the northeast skies during February is the constellation of Gemini the "Twins" with its two first magnitude stars of Pollux and Castor. Pollux is yellowish orange in color, Castor by contrast is pure white. For users of small telescopes Castor is a fine binary star and well worth your effort to search it out.

Castor was first resolved by the Italian astronomer Giovanni Cassini in 1678. In March of 1718 James Bradley began to make measurements of Castor's binary motion and in over forty years of observation he noticed a thirty degree change in Castor's position angle. Sir William Herschel also made observations of Castor and he became convinced that the two stars were bound gravitationally and in orbit about their common center of mass. By 1803 Castor was recognized as the first physical binary system.

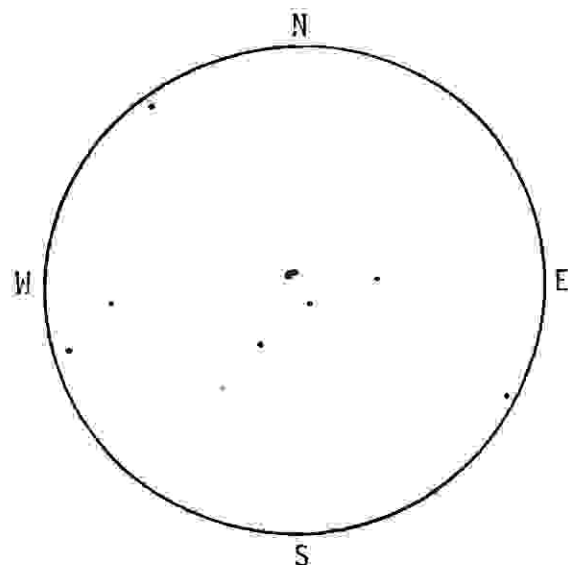
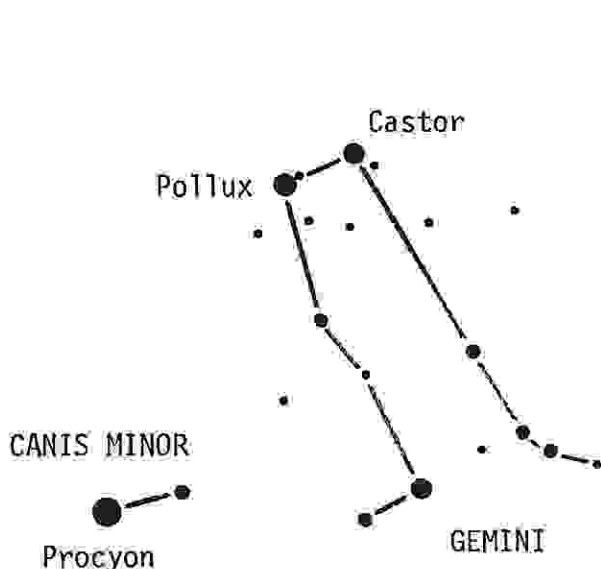
Castor A has a magnitude of 2.0 and Castor B a magnitude of 2.9. Both stars are main sequence stars with spectra of A2 and A5 respectively. Recent observations place the period of revolution at about 445 years. Periastron was reached in 1968 and at that time the two stars were 1.8" apart. I can still remember when as a freshman in high school in 1973 I turned my 2.4"

telescope at Castor and could notch it at 180x, but only on the very stillest of nights. At the present time the two stars are 3.3" apart at P.A. 68° and they are continuing to widen. Castor is a fine sight in a 3" telescope at 100x with both stars appearing creamy white to me. A third star Castor C lies 72.5" from A and B, a vast distance of about 100 billion miles and it probably orbits the main pair in over 10,000 years. This star has a P.A. of 164°. Castor C is also known to be the eclipsing variable star YY Geminorum, it fluctuates in magnitude from 9.1 to 9.6 every 19½ hours. Whereas Castor A and B are main sequence stars the two stars which form Castor C are red dwarfs with identical spectra of dK6. Castor C is also visible in a 3" telescope making this system a visual triple.

In the largest professional telescopes Castor becomes a sextuple star each visual component is itself a spectroscopic binary. The distance to Castor is about 45 light years which means the Castor system has a total luminosity of about 36 times that of the Sun.

During February maybe some night near the full moon when you wouldn't dare search out those faint elusive fuzzies with your telescope turn your telescope toward Castor and observe one of the finest binary stars in the heavens.

Jeff Brydges



Castor in a 3.5" f/11 refractor
at 111x

Reconsidering the Binocular View

Telescopes, telescopes, telescopes. I do love 'em, but it sometimes seems like I've been completely consumed by the pursuit of magnification, eyepieces, finders, aperture, mounts, controls -- the whole exciting techno-chase that seems so worthwhile under our dark Arizona skies. Truthfully, I've had a lot of fun being involved in that chase and in sharing with and learning from many of you along the way. Exciting, and fun!

However, I'm also getting more enjoyment than I ever have from a much simpler, less expensive, and fantastically enjoyable source: Binoculars. Those small, portable, easy-to-use devices that I seemed to almost have given up in favor of telescopes until now. Why now? I've reconsidered, re-learned, and more to the point, re-experienced the truly wonderful night-sky views binoculars can give. And I've found some techniques for getting the most out of these versatile devices that I hadn't considered before. They really do make a difference. I'd like to share them with you. If you have binoculars -- any binoculars -- and a couple of pillows, you can check this out without spending another cent. I think you will be as impressed as I was.

To begin with, we humans are, in fact, visually stereo-designed and equipped organisms. We like two-eye viewing. Our brains do better collating and perceiving the twin images our two eyes normally provide as sensory input. Our brains process and perceive faster using two eyes. They give us better images with more detail, depth, and color. Yes they do. Prove it to yourself right now. Look across the room or outside and choose something to focus on. Then cover one eye and dwell on the image you're perceiving. When you've got it all, uncover the eye and re-consider the same image you're getting with both eyes working. I think you'll agree the field of view seems wider, the object seems larger, and the details you notice seem more numerous and more interesting. And there is the "stereo effect" -- the "3-D" or "depth of field" perception that one-eye viewing simply cannot duplicate. Looking at the night sky with two eyes -- binoculars -- instead of one eye -- the telescope -- will show the same differences. Even the various other "seeing techniques", such as averted vision, still work!

Another benefit of binocular viewing is comfort. You can gaze much, much longer without eye-fatigue using both eyes together instead of just one. And the wider fields of view -- what telescope viewers call "Rich Fields" -- give you more to look at.

For me, these factors alone make binocular viewing worth re-considering so I've tried to maximize the pleasure of my experience by maximizing as many of these stereo benefits as possible. It's not hard and the results have, in fact, astonished me. I think they may astonish you, too, if you'll try them.

For now, don't worry about what kind of binoculars you have. Like telescopes, they come in many different styles, qualities, magnifications, and prices but all of them will provide increased sky-viewing pleasure if you will use these techniques:

- 1) Choose a field of view you already know will be interesting. (Experiment with others later.) Right now, (early January) the sword of Orion (M42, et. al.) is great. The open clusters in Auriga (M35, M36, M37, M38) are right overhead in the early evening as is the double cluster in Perseus (NGC869 & 884) and the rich star fields surrounding them. The Andromeda Galaxy (M31) and a close companion, M33, are very interesting in binoculars. This summer, the Milky Way fields, the spout of the Teapot, and the tail of Scorpio are wonderful. And don't forget the Moon. (The recent eclipse was far more pleasurable to view in binoculars than in my 10" Meade.) Every month, Sky & Telescope publishes a suggested binocular field for your consideration.
- 2) Clean the lenses! You may be surprised at the accumulated crud on your lenses and how much better your images are when it is removed. Don't use windex or coarse cloth to do this! Many lens coatings won't stand up to it. Use extremely dilute mild soap and water or one of the special cleaners designed for the purpose. Use clean Q-tips or lens tissues. And be gentle.
- 3) Hold the binoculars still. I said STILL! (Wiggling images are one of the most irritating and fatiguing of all observing problems!) Prop them on a rail. Lean them against a post. Best, of course, is to mount them on a tripod or other device. (Even if yours are not designed to be mounted, there are inexpensive adapters that will allow you to do it!) The images you see will increase in quality at once.
- 4) Hold your own HEAD still. This is harder but the increase in image quality by doing it is just as great as from holding the binoculars themselves still. Hold on to something, or someone. Lean back against a wall. The absolute best is to lie down on your back on a comfortable pad or chaise lounge with your head on a soft pillow that it can sink into so that even the sides are supported.
- 5) Get focused! Most people have at least slightly different vision in each eye. Most binoculars have a way for each eye-piece to be individually adjusted to allow for this difference. Once you're set up, take the time to make these adjustments and get the best possible focus in each eye before you settle in for your observing session. It makes a big difference!
- 6) Find the best combination! The combination of interesting field of view, clean lenses, still binoculars, still head, comfortable viewing position, and careful focus may surprise you in terms of how much more you can see and how much more pleasant your observing time is!

The lying-down position, especially, is so much better compared to standing and tilting your head backward in order to look up that I want to emphasize it. If you haven't done this, you're really missing something. There are binocular mounting devices specifically designed to be used in this position (I use Robert Miles' "Sky Hook". There is also an article in Sky & Telescope April '93 on how to build your own.) but for all but the largest binoculars you can accomplish most of the task with only a pillow. Once you're lying down with binoculars in-hand, place a pillow high on your chest, right up under your chin. Bring your lower arms, hands, and binoculars up over the top of the pillow and rest them there letting the pillow support the weight of your hands and binoculars. If you do this right, the only wiggling you'll deal with is your own breathing and the beating of your own heart!

The selection and evaluation of specific binoculars and mounts is really a separate subject. Certainly, with better instruments better images can usually be expected. However, the techniques suggested above will dramatically enhance the views you get from any binoculars you use. You'll see more. You'll see more detail. You'll see more color. There is even a perception of increased magnification because of the new-found stillness of the view. Because of the lower power and wider field of view binoculars provide, city lights won't dampen your pleasure as much as with a telescope. And you'll be relaxed and comfortable so you can stay out longer.

1/7/94 by Philip C. Farnam

5825 N. Misty Ridge Drive, Tucson, AZ 85718, (602) 299-5484

TAAA Exec Meeting - 13 January, 1994

Meeting called to order at 7:40

1. Land Issues - Pozo Nuevo site has been sold to the government to become part of the Buenos Aires Wildlife Refuge. There was some interest in contacting them to see if they would support dual use with us at one of their headquarter locations. Tucson Soaring Club was recently visited by Dean, Teresa, Gary and Rob. Their current lease payments are \$2,045 per year to BLM and \$450 per month to the caretaker living on site. Clubhouse is currently being renovated with two bathrooms and 3 bedrooms in the works. There was some talk of restrictions they might put on us for access to property. No discussion on other sites. Dean wants to organize a meeting of land committee to re-evaluate needs and goals of the Club's search.

2. Fundraising News - The TAAA membership in the Tucson Convention Bureau was renewed. Dean got prices for various t-shirt setups with Sunrise Silkscreens. Prices were less than \$8 for two or three color designs. Existing contest winner (from a couple years ago) was impossible to have color separation work done. Will contact winner to redo artwork or call for new designs. Terri is looking for a speaker and location for a 40th anniversary banquet. A big name speaker is being sought - Sally Ride would cost \$12,500. Terri will contact ASP who ran the Universe '93 convention with all the big names in San Diego last year to get ideas.

3. After School Activities - Duane and Sharon are starting an astronomy class for two school systems starting 27 January. Dean

asked them again for a description of their activities and request for assistance for the newsletter.

4. Upcoming Events - A new series of star parties was discussed - a cooperative effort between TAAA, Kitt Peak, Saguaro National Monument and the Nature Company for 12 February and 12 March. Kitt Peak and Flandrau are both contemplating an event with comet Shoemaker Levy's collision with Jupiter in July. Our input is welcome. TAAA has been asked to teach a three day astronomy class as part of our stay at this year's Grand Canyon Star Party. The Club could gain up to \$350 for a few hours of classroom effort and some nighttime viewing.

5. Treasurer's report - Total Bank assets are \$23,953. Automatic Donation is currently bringing in \$330 per month.

6. A.L. News - There was no Astronomical League business.

7. Other Business - Terri and Gary want to cut the number of free newsletters sent out. The major number of these are for about 20 being sent to attendees of the Grand Canyon Star Party from last year. We could save about \$100 by cutting these out. Dean countered that it was the only payback these volunteers got and if TAAA wanted to continue to sponsor the event, it was a small price to pay for the publicity we get.

The TAAA currently has no liability insurance. The policy we had last year seemed to be inadequate for what we really needed. Executive members are asked to call their agents to see who could write a liability policy for a non-profit group such as us. **The meeting was adjourned at 10:10.**

Desert Skies Classified

For Sale: Christmas art work? all are framed and matted by Nova Graphics. "Green Piece" 138/950, by Kim Poor \$75.00, "David and Goliath" 117/950, by Bob Eggleton \$80.00, "Barnards Planet" 45/950, by Joe Tuccarone \$65.00. Call Mike evenings 797-1693.(2-94)

FOR SALE: Casio fx-7500G Programmable Graphic Calculator, with both manuals; barely used, like new, \$35. Casio fx-7700GB Programmable Graphic Calculator, with manual, barely used, like new, \$45. Rob Nyberg, 745-0710 e-mail: 70541.1027@compuserve.com (3-94)

WANTED - Telescope Builders. If you want to make a wooden tube assembly or mount, but don't have the tools, I have a woodshop, and I'd like to improve my woodworking skills by helping you build your tube and/or mount. I have plans and ideas, too. Rob Nyberg, 745-0710 e-mail: 70541.1027@compuserve.com (3-94)

For Sale: Meade 5" APO refractor w/full computer control and 8,000 object memory. New, \$3,200. Gordon Gower, 749-0398.(3-94)

Wanted: Someone to fix a 4" SC Bausch & Lomb telescope so that it can track in the Southern Hemisphere. Call ED Vega: 721-3815 (work) or 747-9323 (home).

Upcoming Events

Gilbert Ray Star Party

When: 12 Feb., 1994. 6:00-9:00 p.m.

Where: Gilbert Ray Campground, off of Kinney Road south of the Desert Museum.

This is an event co-sponsored by Kitt Peak National Observatory, TAAA, Saguaro National Monument, Flandrau Science Center and the Nature Company. The TAAA has been invited to set up telescopes at sunset. This presents a good opportunity for us to promote the joys of stargazing, club membership and possibly raise more funding for our land fund. The last few

times this event was scheduled we experienced terrible weather let's hope the odds give us a break cloud wise this time around. In the event of overcast skies, rain, etc. the event will be canceled. To reach the campground take Speedway west past I-10 through Gates Pass (and some spectacular scenery). When you come to Kinney Road make a right (just like if you were going to the Desert Museum) and continue northwest 0.6 miles until you see a highway sign saying "Gilbert Ray Campground" pointing you to McCain Loop Road on the left. The entrance to the campground is on McCain Loop Road.

322-3426

Announcement

What: Saturday Science

When: Saturdays starting Jan. 29,
9:30 a.m.-12 noon.

Where: Flandrau Science Center

Flandrau Science Center is starting its winter-spring series of Saturday Science workshops for children ages 8-14. The first workshop on January 29 is entitled "Hot Air Balloons" and is designed for children in

grades 4-6. Children who attend will build and fly a hot air balloon (and learn some science in the process). Workshops for February are astronomy related and will include students making their own star wheels and telescopes. In many workshops students will get to take home what they make. Cost of the workshop is \$15 (a real bargain) and children must be pre-registered. If you know of a child this age who is interested, please call Nancy or Molly at 621-4515, 9AM-5PM.

Talks of Astronomical Interest

Steward Observatory Public Evening Series

Monday, 31 January - 7:30 pm

Jim Liebert - "First Results from the Clear-Eyed Hubble Space Telescope" Talk is in room N210 (where TAAA holds its meetings). Observing with the 21" telescope follows, weather permitting.

The following talks are sponsored by Whipple Observatory and the Green Valley Recreation Association and are held at 3:30 pm at the Green Valley Recreation Center West Auditorium. Admission is free.

February 1 - "Intelligent Life Out There and Down Here" with Nelson Caldwell

February 8 - "The Big Bang" with Craig Foltz

DARK SKIES for Tucson (in MST)

1994 FEBRUARY no twilight
no moonlight

Tu/We	1/ 2	7:22pm	-	11:57pm
We/Th	2/ 3	7:23pm	-	1:03am
Th/Fr	3/ 4	7:23pm	-	2:07am
Fr/Sa	4/ 5	7:24pm	-	3:07am
Sa/Su	5/ 6	7:25pm	-	4:04am

Su/Mo	6/ 7	7:26pm	-	4:54am
Mo/Tu	7/ 8	7:26pm	-	5:39am
Tu/We	8/ 9	7:27pm	-	5:49am
We/Th	9/10	7:28pm	-	5:49am
Th/Fr	10/11	7:29pm	-	5:48am
Fr/Sa	11/12	7:30pm	-	5:47am
Sa/Su	12/13	8:23pm	-	5:46am

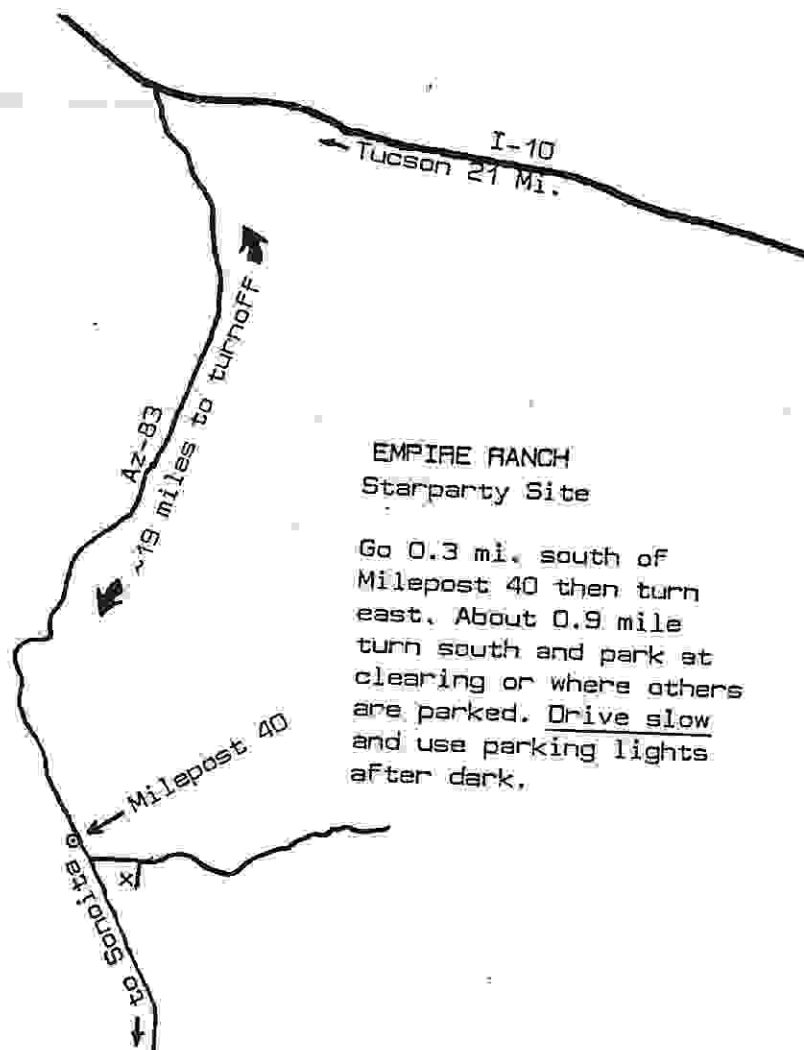
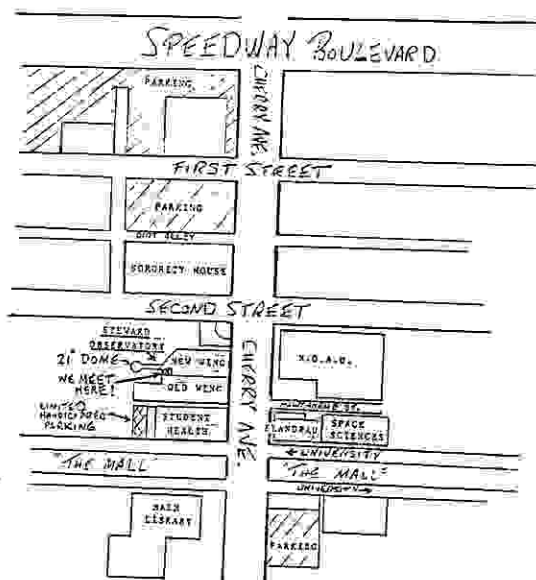
Su/Mo	13/14	9:18pm	-	5:45am
Mo/Tu	14/15	10:11pm	-	5:44am
Tu/We	15/16	11:05pm	-	5:44am
We/Th	16/17	11:58pm	-	5:43am
Th/Fr	17/18	12:52am	-	5:42am
Fr/Sa	18/19	1:45am	-	5:41am
Sa/Su	19/20	2:37am	-	5:40am

Su/Mo	20/21	3:27am	-	5:39am
Mo/Tu	21/22	4:14am	-	5:38am
Tu/We	22/23	4:59am	-	5:37am
We/Th	23/24	-	-	-
Th/Fr	24/25	-	-	-
Fr/Sa	25/26	-	-	-
Sa/Su	26/27	-	-	-

Su/Mo	27/28	7:42pm	-	8:36pm
Mo/Tu	28/ 1	7:42pm	-	9:44pm

Erich Karkoschka

Meeting Location



Tucson Amateur Astronomy Association
P. O. Box 41254
Tucson, AZ 85717

Forwarding and return postage guaranteed
Address Correction requested

