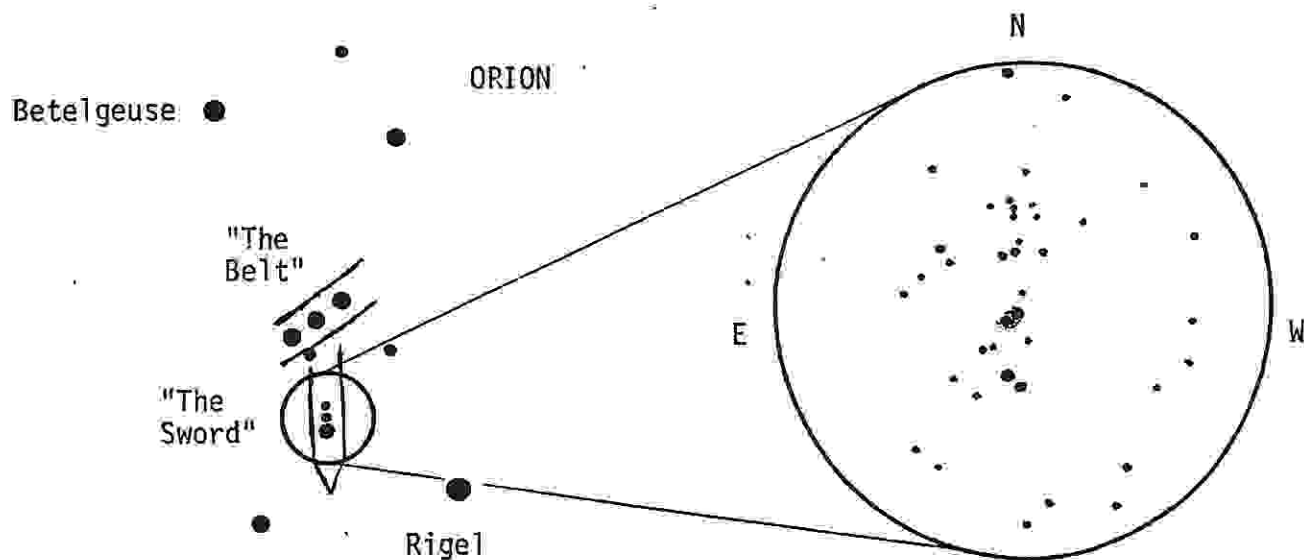


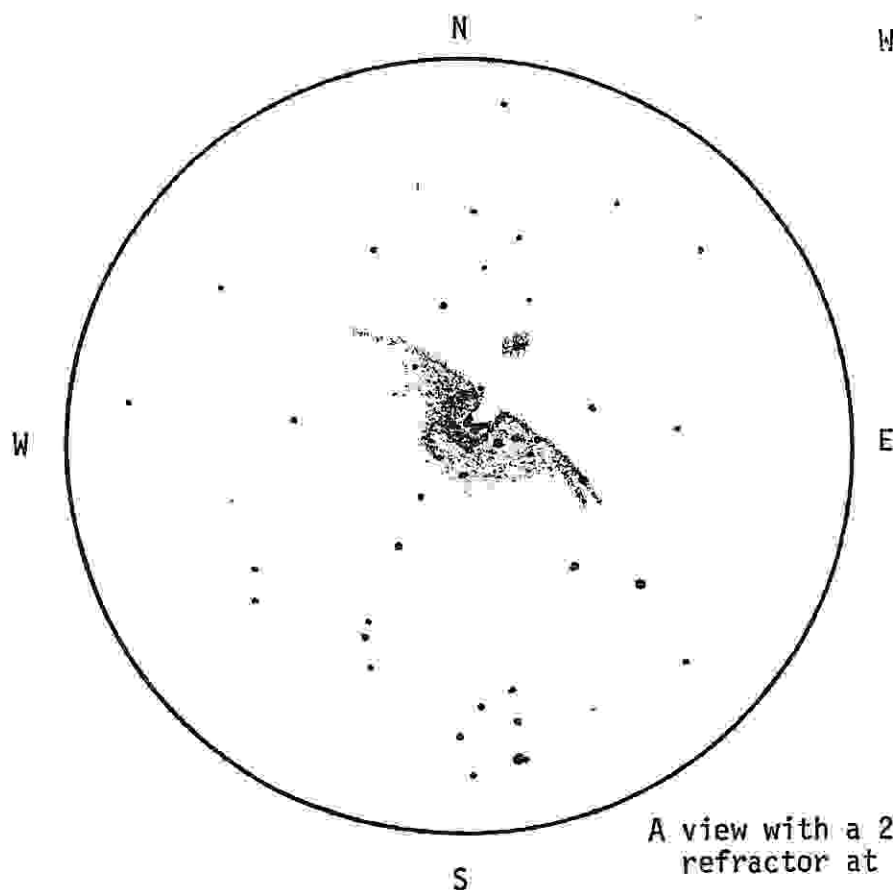
# Desert Skies

January, 1994

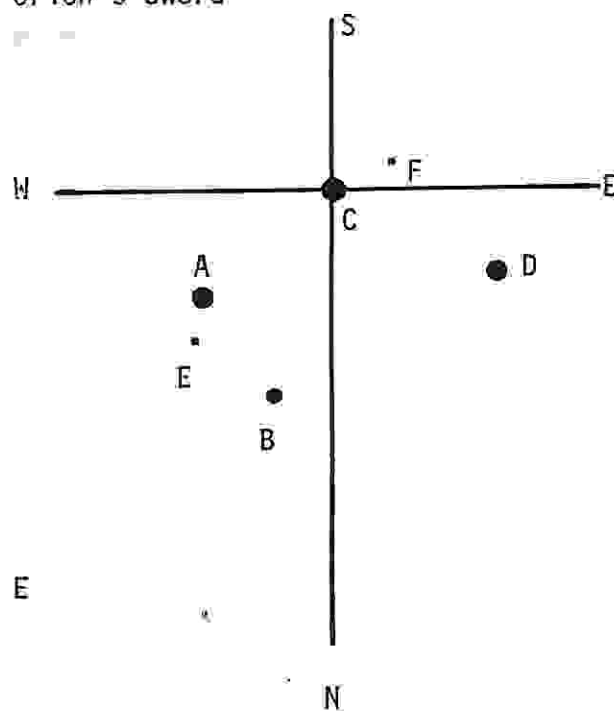
*The Newsletter of the Tucson Amateur Astronomy Association (TAAA)*



A view in 8x40 mm binoculars of Orion's Sword



A view with a 2.4" f/15 refractor at 50x



A close up view of the trapezium in an inverting telescope showing all six stars

**GENERAL MEETING - Friday, January 7th, 7:30 pm** at the NEW Steward Observatory Auditorium - room N210. The January Meeting is a "Members Night".

**6:45 pm - pre-meeting "Beginners lecture"** by Jeff Brydges will be "Using a Telescope" All are welcome! ("old" Steward obs. room 204). See enclosed map for directions!

**EXECUTIVE MEETING - Thursday, January 13th, 7:30 pm** at Flandrau Science Center's Conference Room

**30" TELESCOPE DESIGN, LAND & FUNDRAISING MEETING - Wednesday, January 19th, 7:30 pm** Location to be announced - call Dean.

**STAR PARTIES:** January 8 - Star Party at our Potential new site - see map inside!  
January 15 - Public Star Party at Sabino Canyon!  
January 29 - Public Star Party at Whipple Observatory Base Camp.

**Next Newsletter Deadline - January 19th**

**COVER:** Jeff Brydges provides the cover artwork portraying the views of the Orion Nebula with smaller instruments. Use the diagram of the Trapezium to note relative brightnesses before the January 7 meeting when component A will be in eclipse. See the enclosed articles by Gary Rosenbaum and Jeff Brydges for more information. Back Cover: Use this map for finding the Whipple Observatory Base Camp for the public star party on the 29th.

#### 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.

## January's Meeting - Member's Night!

The January meeting has been selected to be a member's night. This is your chance to stand up and tell us about the projects on which you have been working, places you have been, or observations you have made. Don't be shy, we want to know, really! We will limit you to 15-20 minutes, unless we get a

lot of volunteers, in which case you may get less.

At this point, we only have one presentation - a video of the lunar eclipse last month. That is sure to be interesting, as well as the one you can give... Call Dean at 293-2855 to reserve your spot on the agenda.

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### Beginner's Lecture Using a Telescope

Did you buy yourself a new telescope or did you receive one as a gift? Do you feel lost about how to put it together or how to use it? Don't fret any longer! This month's Beginner's Lecture will help you sort out the telescope, eyepieces and mount from one another and give you an idea of what your new telescope will show you in the sky. The lecture will focus on refractors of the 60 to 80mm diameter (the typical first telescope), but if you have a larger telescope and need some help feel free to attend this

lecture. Jeff Brydges will be giving the lecture this month. Jeff knows small refractor well, having regularly observed with his 3" refractor and now a 3.5" refractor. He also has a 6" reflector and used to have a Celestron C-8, so he will be able to give advice about larger telescopes too.

The Beginner's Lecture starts at 6:45pm, 45 minutes before the start of the regular meeting. See you at 6:45pm on January 7th in room 204.

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### Trapezium Eclipse

In the heart of the Great Orion Nebula is one of the best known multiple star systems in the sky, the Trapezium. On our January 7 meeting night the variable star A of the Trapezium will be in mid eclipse. As noted in the Jan 94 issue of Sky & Tel page 83 both star A and star D are usually at magnitude 6.5 but at mid eclipse at 9 pm star A will fade to magnitude 8, the same brightness as star B.

The 1.5 magnitude drop in brightness will be quite obvious and will make the fainter mag 11 star E easier to see. I plan to have one of the Steward telescopes or one of our own amateur telescopes available for our members to observe this event at about 9 pm so plan to stay late enough to see this interesting event.

-Gary Rosenbaum

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### TAAA Turns 40!

In 1994, the Tucson Amateur Astronomy Association turns 40 years old. One of our goals this year is to dedicate a permanent observing site. In addition to goal we are looking for other ways to

commemorate this event. If you have any suggestions for the Executive to pursue, call anyone on the Executive board to express your ideas.

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### Walter Scott Houston dies in Mexico

The following news is courtesy of Doug Slauson (76270.67@CompuServe.COM), via David Oesper.

Walter Scott Houston, author of Sky and Telescope's Deep-Sky Wonders column since 1946, has died. Many of his reports were based on observations made with diminutive apertures, such

as his 4-inch Clark refractor.

He died of pneumonia on December 23rd during a road trip in Cancun, Mexico with his wife. They were intent on exploring Meso-American archeological sites and the southern skies. Walter Scott ("Scotty") Houston was 81.

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### Nova Cassiopeiae 1993

Japanese amateur Kazuyoshi Kanatsu discovered a 6th magnitude nova in Cassiopeia on December 7th. It has since brightened to magnitude

5.3 on the 17th (and is now in slow decline) and should be easily visible in binoculars at R.A. = 23h39m22s, Dec. = 57d14'23" (1950 coordinates).

## Exploring The Trapezium

This month Orion lies high in the southern skies along the meridian during the evening hours. Just below Orion's three belt stars hangs the "Sword of Orion" which contains the "Great Orion Nebula" (M-42). The region around M-42 is ablaze with nebulosity, variable stars, and many binary star systems that are suitable for telescopic observation.

At the center of the Orion nebula lies its main illuminator Theta Orionis - a fine multiple star. Even in binoculars you will be able to resolve Theta into two stars. Theta-1 is a magnitude 4.9 star and Theta-2 has a magnitude of 5.0, and is 135.3" distant to the southeast of Theta-1. Theta-2 has two more companions visible in small telescopes, one is a magnitude 6.5 star, 52.5" distant at P.A. 92° and it has a spectrum of B1. The other star is the irregular variable V361 Orionis. It is an Orion-type variable with a magnitude range from 7.8 to 9.6, and it is 128.7" from Theta-2 A, and has a P.A. of 97°, and a spectrum of B8.

In a small telescope Theta-1 easily transforms into four stars at 50X forming a trapezoidal configuration, thus its name the "Trapezium". The primary of the Trapezium is actually Theta-1 C, a magnitude 5.1 star having a spectrum of O6. Theta-1 D is the easternmost star of this group. Having a magnitude of 6.7 and a spectrum of B0, it lies 13.3" from C at P.A. 61°. The next two stars are rather interesting because they are eclipsing binary systems of the Algol-type. Theta-1 A (V1016 Orionis) usually shines at magnitude 6.7, but every 65.5 days it dims one magnitude to 7.7 and nearly equals Theta-1 B in

brightness. This eclipse lasts for about 19 hours and your next opportunity to watch this event will occur around January 7th. This star has a spectrum of B5.

Theta-1 B (BM Orionis) is the faintest of the four stars shining at magnitude 7.9. It dims every 6.5 days by about half a magnitude to 8.5, and its eclipse also lasts for 19 hours. Theta-1 A lies 12.9" from C at P.A. 311°, and B lies at 16.8" from C at a P.A. of 342°.

Two more stars may be visible in moderate sized amateur telescopes. These are Theta-1 E and F. Theta-1 E is an 11.1 magnitude star and it lies 4.1" distant from A at P.A. 351°. Theta-1 F is an 11.5 magnitude star and it is 4.0" distant from C. Some observers have seen these two stars in a 6" reflector when the air was very steady. I can see them in my 6" f/8 reflector at 133X quite easily. Try your telescope if it is larger than 4" in aperture and see if you can spot them. Sometimes E is easier to see when A is in eclipse.

The stars of the Trapezium are very young and massive and are part of a cluster of over 300 newly formed and still forming stars. Some astronomers estimate the age of the Trapezium stars at about 300,000 years old, making this one of the youngest star clusters in the galaxy. The distance to the Trapezium is about 1600 light years.

On any cold clear winter's night the Trapezium is always a wonderful sight in a telescope. And as you peer at these stars imagine the tremendous amounts of energy pouring off these newly formed blazing suns that are illuminating your eyepiece.

-Jeff Brydges

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## Public Star Party at Sabino Canyon

On the 15th, there is a 4 day old moon and a last chance to get a look at Saturn for a while - It's a perfect night for a public star party! Bring your scopes to the

Sabino Canyon parking lot about sunset and we can show folks the moon, Saturn and more. You'll come now!

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## PUBLIC STAR PARTY

COSPONSORED BY WHIPPLE OBSERVATORY

Another Santa Cruz Valley Public Star Party will be held at the Whipple Observatory headquarters on Saturday January 29th. Located at the base of Mt. Hopkins in the Santa Rita Mountains south of Tucson (about 40 miles from the University of Arizona), this site is reasonably dark and great for public star parties. Last January we had about 300 people show up, so we're expecting a heavy turnout again. With a group this large we can use all the help we can get...if you don't feel like lugging the telescope out, just show up (bring your

binoculars) and be available to answer questions or help the parking attendants. The Visitor's Center will be open and coffee and hot chocolate will be provided by Whipple Observatory. Arrive by 5:00pm to set up telescopes. Feel free to attend the lecture which will begin at 5:30pm; observing will start immediately after the lecture. Check out the new displays in the Visitor's Center while your there! A map is provided on the back page of this newsletter.

-Terri 579-0185

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## Its a Video Party!

I thought it was about time I had a viewing of the John Dobson telescope making video. It will be at the home of Dean and Vicki on Friday, the 14th of January, at 7:00. Please call and tell us you will be attending, because if there is more than 8 attending, it will be moved to the Mirror Laboratory, where we can combine it with a tour of that facility if there is interest.

The Dobson video is quite interesting. The man has a huge following, yet a lot of his techniques seem strange by most optician's standards. But it demonstrates quite well his methods of making and mounting his "light buckets". Let's call out for pizza and make it a sociable evening - it will be fun for all!

-Dean Ketelsen

293-2855



It is that time of year again - this will hopefully appear in February's REFLECTOR.

## Grand Canyon Star Party

Where is the perfect astronomical getaway? A place where the spouse and kids would have lots to keep them busy during the day, where there are lots of interesting people, including a large international crowd, and where the skies are dark and the seeing great? It was sort of a best kept secret, but no more - it is the Grand Canyon! For three years now, the Tucson Amateur Astronomy Association (TAAA) has been going to the Canyon in the June dark-of-the-moon for what has to be one of the largest public star parties.

My first visit to the Grand Canyon was in June of 1979, where I was entranced by John Dobson and the San Francisco Sidewalk Astronomers. Starting with a slide show at sunset, hundreds of people would gather and listen as John talked knowingly about the universe. They would then all stay to view through the behemoths in the parking lot. The view of M13 with their 24" from the top of a tall ladder is with me still.

Eleven years later, after marrying in Las Vegas and stopping at the Canyon with a small telescope, my new wife Vicki and I found we could easily attract a crowd by setting up and offering views. We later decided it would be a great way to celebrate our anniversary by holding an annual star party at the South Rim. The objective is to maintain an astronomical presence there for two weekends and the week in between. The first year, in 1991, we had seven TAAA members spread out thinly, but we had enthusiastic crowds and have grown every year. In June of 1993, we had over 25 amateurs showing the sky to thousands of Canyon visitors.

The concept is simple and lots of fun. The Canyon has millions of visitors yearly, though only about 10% stay overnight. The mostly international crowd is always surprised to see us there, but as is mostly the case, the unexpected pleasures are the most treasured. We have been showered with gratitude on every return.

We generally use the same routine every year. Since the population of Grand Canyon Village is transitory, we have to have "new blood" every night. Many amateurs volunteer to set up on the prominent outlooks to show people sunspots or views across the Canyon. Visitors are most impressed if you show them the Colorado River rafts disgorging their passengers far below. If they are staying overnight, many return with your promise to show them equally impressive views of the cosmos. Yavapai Point is a popular sunset gathering spot, and a telescope or two and setting up for a slide presentation collect a few more potential observers. We rotate orientation talks among several volunteers to keep the talks fresh and individualized. We do get

some repeat business, and the different perspectives are refreshing. As twilight deepens and the questions end, it is a short 70 yard walk to the observing field where hushed observing is punctuated by the occasional incredulous outburst. The best part is that most stay only a couple hours, then you are left on your own to stretch the limits of your telescope in some of the darkest skies anywhere.

In 1993 the viewing was dominated by Jupiter, the supernova in M81 and of course the galaxies of the spring sky highlighted by the rising Milky Way. We had an incredible 8 clear nights in a row - a record I would like to see any other star party match. In addition the seeing is amazingly good for being so close to a mile deep trench!

The dates for 1994 are June 4-11, and if you are interested in attending and want a real bed to sleep in, you haven't a moment to lose. June is the Grand Canyon National Park's busiest time, and it is never too early to book a room. Most hotels fill up 3-4 months in advance so you need to act now. Camping is a different story, as sites are available days before your visit. Refer to the phone list below for hotels and camping. The TAAA charges no registration fee - just take care of a place to stay and let us know you are coming (you need to sign liability waivers for TAAA and the National Park Service).

Come join us and have a great time, but be prepared to be exhausted, because with the Canyon calling by day and the incredible skies by night, who has time to sleep?

**Housing:** For reservations at any of the motels or lodges at the South Rim or for Trailer Village (camping trailers or RVs) call Fred Harvey Inc at (602) 638-2401 as soon as you make your plans! Expect long telephone waits while making your reservations.

If you can tolerate a 7 mile drive, you can also try the following Motels at Tusayan (All area code 602):

Squire Inn	638-3515
Moqui Lodge	638-2424
Quality Inn	638-2673
Red Feather Inn	638-2414
7 Mile Lodge	638-2291

**Camping:** To make reservations for campsites at the regular rates (\$10 per night), call MISTIX at 1-800-365-2267, no more than 8 weeks ahead of your stay.

For questions concerning the Grand Canyon Star Party, please call or write to me at: 1122 East Greenlee Pl. Tucson, AZ 85719, home phone (602) 293-2855 or e-mail at [ketelsen@as.arizona.edu](mailto:ketelsen@as.arizona.edu).

-Dean Ketelsen, President, TAAA

# Now You Know the Real Story!

We always assume professional observations are made with the usual dull routine. The announcement of an observation of a Chiron occultation does not reveal the adventure behind the story. Rick Hill fills us in on this one...

On Saturday, Nov.06, 1993, Bob Marcialis and I left for the San Diego environs. The trip there was uneventful with our truckload of CCD equipment and a C14. This was going to be a touch-and-go affair since the occulted star was 14th mag. We needed the best time resolution we could get and in order to get that we "binned" the chip so every square of 4 pixels would act as one. This costs you spatial resolution but the readout improves by a factor of 4 and the signal to noise is good at 2 sec. readout. It was the best we could do, and since we did not need resolution, only photometric information, it was O.K.

We got to El Cajon, only a couple of days after the fires, and found the area so polluted that it was impossible to observe there. Winding our way back east on small roads south of I-8 we stumbled into Alpine, got back on 8 and headed for Live Oak Springs. There we got off and headed south again. The skies were much better there, in the mountains, but there was no where to stay. We needed a hotel or motel for power; even a gas station would do. The occultation was to be in the early morning twilight so sleeping room would be nice.

After driving through the tiny communities that barely had electricity & water, we went back north again to I-8. At the Boulevard exit of I-8 we found a one lung motel. As we assessed the situation we kept seeing more and more mercury vapor lights. The manager said she would be unable to turn them off and that this frustrated her own efforts to photograph the stars. I began to question her on her own astronomical interests to see if I could get some sympathy and directions to a better site. Boy, did I hit pay dirt! She mentioned an observatory in the hills to the south and gave us rough directions. We were off. Down the road (CA-94) a piece we met up with U.S. Border Patrol agents. They should know the area, so we asked for more specific directions. They did all but deliver us to the site personally. We found the multi-acre site of the San Diego Astronomical Association. After a bit of conversation we found that they had three buildings on the site, and dozens of cement pads with electrical power. It was Mecca! The Vice Pres., Frank Santore, offered us his personal pad with a red-lighted cabinet complete with microwave.

After a quick trip to a local grocery mart, we came back and entertained the troops with the antics of two professionals stumbling through the process of setting up computer, telescope, GPS time and position finder (connected directly to the computer) and the Photometrics CCD camera and cooling system itself. Several hours later we were taking images of the Pleiades and Orion Neb. All seemed to be working well so we broke off, ate sandwiches and then crashed in the truck in sleeping bags.

About three hours later, now around 3:30am, we got up and went back to the equipment. The computer had crashed in the 38-degree temps. We rebooted repeatedly with no luck. I got out a heating pad and put it on the 486 box. In a few minutes it was working again. I got the

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## (2000) CHIRON

M. W. Buie, Lowell Observatory, reports: "The stellar occultation candidate Ch02, identified by Bus et al. (1993, submitted to A.J.), was predicted by C. Olkin, S. McDonald, C. Ford, J. Foust, L. Sopata, and J. L. Elliot with sufficient accuracy that observations by four teams were successful in observing the occultation by (2000) Chiron on Nov. 7. These teams were manned by the University of Arizona, Massachusetts Institute of Technology, Ames Research Center, NASA, and Lowell Observatory at the following locations: Tierra Del Sol, CA (R. Marcialis and R. Hill); Palomar Mountain (S. Bus and R. Meserole); Ojai, CA (L. Wasserman and J. Spencer); and Table Mountain (E. Dunham, M. Buie, and J. Young). J-band images were also obtained around the time of the event by T. H. Jarrett, C. A. Beichman, and T. Hether using the Palomar Prime Focus Infrared Camera on the 5-m Hale Telescope. The flux of the star was seen to drop by 80 percent for 7 s at the Tierra Del Sol site. The observation is consistent with a single chord, placing a lower bound of 160 km for the diameter of Chiron. However, this interpretation requires that the star be an unresolved double of which only one component was occulted by Chiron. Preliminary spectra from the Perkins 1.8-m telescope do not confirm the duplicity of the star, but the results are not yet conclusive. Each of other sites noted shallower unresolved dips that decrease in strength with increasing distance from Chiron and occur at nearly the same time, but they are inconsistent with chords from a solid surface occultation. These dips may be due to larger-than-average noise, or to an occultation by a narrow (< 10 km) dust jet."

telescope on the field and with much difficulty found Chiron. We had practised this in the observatory on campus several times the week before, but now there were many more stars! We acquired the field at 11:50 UT. Next we took full frame, wide field and deep exposure images about then to see Chiron. There it was nearing the little star. Now to occultation mode. The computer crashed. Reboot and try another exposure. Crash again. This went on and on. We adjusted parameters and kept trying as the minutes ticked on. The occultation was predicted for 13:18 UT. At 12:45 I was getting worried. This would be awful to miss the event simply because the computer failed to stay on line. I was prepared to use stopwatch and eye if nothing else. At 13:00 UT Bob was trying anything. The program would not accept our exposure parameters. At 13:04 I said in a loud voice, "Screw it; go with Hubbard's default parameters." They didn't look right but instantly the system worked. Bob asked what we should do for number of exposures in each image cube. I suggested we go with 50, 2 sec. exposures for now so we could clear our heads and set up the next batch. We did so and began taking data. It was 13:10 when we began a 350 exposure cube of images (that's 350 images stored with one header as a single image—a very compact way of storage). This cube ran well past the predicted time. This was followed by two 250 image cubes and then 100 images with the cover on called 'darks' for reducing the data.

We got ready to do 100 image of bias or electronic noise for reduction purposes when the machine crashed again. Should we reboot? Should we leave all the data on hard disk or transfer to an optical? My suggestion that I insisted on was leave it alone, pack and get back to the lab. In the cold damp of that morning I didn't want to do anything that might result in data loss! We knew we had something but thought it was only 3-4 seconds long. Imagine our surprise when it turned out to be over twice as long and only a partial occultation.

-Rick Hill

12/20/93

**TAAA MEMBERSHIP LIST** for corrections, call Gary Rosenbaum 579-0185

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Early	Wallace	622-5038	2582 N. Jordan Dr.	Tucson	AZ	85745
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Gaddis	Tim		3519 N. Sierra Madre	Tucson	AZ	85749

Last Name	First Name	Phone	Address 1	City	St	Zip
Gandet	Thom	296-5399	6830 E. 3rd St.	Tucson	AZ	85710-1244
Gardner	Gary		14855 W. Belmont Dr.	Casa Grande	AZ	85222
Garramone	Robert J.	881-4256	4850 E. Edison St	Tucson	AZ	85712
Gill	Timothy E.		10201 E. Skycastle Way	Tucson	AZ	85730
Goff	Bob	790-1452	5712 E. Cooper	Tucson	AZ	85711
Goldsmith	Don A.		201 Highcourt	Tucson	AZ	85737
Goldstein	Michael		5312 E Cloud Nine Dr	Tucson	AZ	85737
Gower	Gordon	749-0398	11411 E. Calle del Rincon	Tucson	AZ	85749
Grajewski	Julian		1503 W. 4th St.	Winslow	AZ	86047
Grant	John	544-9548	1677 W. Chimayo	Tucson	AZ	85704
Guerrero	Robert	296-6208	3261 N. Placita Brazos	Tucson	AZ	85715
Hall	Gary & Gretchen		6722 N. Cocopas	Tucson	AZ	85718
Hancock	Molly	884-4733	1001 W St Marys Rd Apt 408	Tucson	AZ	85745
Hardaway	Dr. E. Joan		10401 E. Plumeria Rd.	Tucson	AZ	85749
Harris	Robert M.		337 S. 18th St	Philadelphia	PA	19103
Harvey	David	797-2512	1552 W. Chapala	Tucson	AZ	85704
Head	Roy	825-3862	14508 N. Lone Wolf Ln.	Tucson	AZ	85737
Henning	Scott	326-7039	4411 E. Holmes St.	Tucson	AZ	85711
Henthorn	Harold		2220 W. Turtle Dove Lane	Tucson	AZ	85741-9151
Herbert	Robert J	287-5502	965 N Silverlode Trail	Nogales	AZ	85621
Hill	Richard & Dolores	721-0123	10130 E. King Manor Dr.	Tucson	AZ	85730
Hoag	Art	795-8644	4410 E. 14th	Tucson	AZ	85711
Hunter	Tim	299-2972	4905 E. Entrada Primera	Tucson	AZ	85718
Hurwitz	Michael		2345 N. Craycroft #132	Tucson	AZ	85712
Johnson	Kathryn	825-3052	Rt 42, 16670 N. Capstan	Tucson	AZ	85704
Johnson	S. Greg		1326 E. Blacklidge Dr.	Tucson	AZ	85719-2666
Johnson M.D.	Robert J.	749-1865	9880 E. Morrill Way	Tucson	AZ	85749
Jondrow	Jim & Marjean P.	742-2936	8625 N. Sunnyslope Dr.	Oro Valley	AZ	85704
Jones	Arno E.	322-5045	2882 N. Rosemont	Tucson	AZ	85712
Karkoschka	Erich	621-2819	University of Arizona	Tucson	AZ	85721
Kaseler	Ted	749-9601	9225 E. Tanque Verde #10202	Tucson	AZ	85749
Keefer	Andrew	790-6557	6050 E. 35th St.	Tucson	AZ	85711
Kenyon	Tim	626-8300	P.O. Box 42523	Tucson	AZ	85733
Kessel	James	883-2524	2926 W Nebraska	Tucson	AZ	85746
Ketelsen	Dean & Vicki	293-2855	1122 E. Greenlee Place	Tucson	AZ	85719
Kinash	Ed		19 Atchison Crs.	S4R5J8		
King	Anga B.	896-2054	P.O. Box 840	Oracle	AZ	85623
Kirby	Phillip	964-1636	4990 Willondale Rd.	Springfield	OH	45502
Knauss	Daniel	529-2387	5808 N. Moccasin Trail	Tucson	AZ	85715-0801
Ktaylor	Loriva	742-7184	7615 N Andover	Tucson	AZ	85704
Kumm	Keith	577-2643	P.O. Box 43474	Tucson	AZ	85733
Lancaster	Chris T.	750-9463	4301 E. 29th St. #230	Tucson	AZ	85711
Landon	Thomas	886-3643	2160 N. Pantano Rd. #107	Tucson	AZ	85715
Lappin	Teresa	579-0185	P.O. Box 40363	Tucson	AZ	85717
Lawler	Richard & Hazel		PO Box 8	Arizona City	AZ	85223
Levine	David	625-4437	3319 S. Calle Del Albano	Green Valley	AZ	85614
Levy	David H.	762-5638	120 William Carey St.	Tucson	AZ	85747
Lewis	Vivian	456-1653	Rt. 1, Ash St.	Huachuca City	AZ	85616
Liese	Lawrence		3725 Ironwood Hill Dr.	Tucson	AZ	85745
Lorenz	Paul	889-6490	3722 E. Milton Rd. #7	Tucson	AZ	85706



Last Name	First Name	Phone	Address 1	City	St	Zip
Lowman	Rip & Arlene	749-9604	3980 N. Via del Sol	Tucson	AZ	85749
Lynn	Robert B.	744-1232	4901 W. Lambert Lane	Tucson	AZ	85741
Martin	Robert C.		1671 N. Nancy Rose Ave.	Tucson	AZ	85712
Mayhew	Robert	884-5068	443 E. 34th St.	Tucson	AZ	85713
McDaniel	Robert	625-5724	822 Hermosa Place	Green Valley	AZ	85614
McDonald	James A.	292-4691	1 E. River Rd. #610	Tucson	AZ	85704
McGaha	James E.		5100 N. Sabino Foothills Dr.	Tucson	AZ	85715
McGlocklin	Richard	749-9434	3170 N. Avenida Del Conejo	Tucson	AZ	85749-9544
Mechler	Gary	298-0456	6930 E. Arrowhead Place	Tucson	AZ	85715
Merems	Bernard H.	394-2739	P.O. Box 925	Patagonia	AZ	85624
Meriwether	Douglas	296-4457	6110 E. San Marino St.	Tucson	AZ	85715
Metcalf	Donna J	529-0304	4732 Paseo Sonoyta	Tucson	AZ	85715
Meyer	Andrew & Laura	742-4549	1440 W. San Annetta	Tucson	AZ	85704
Meyer	Arthur W.	290-1313	1940 S. Oak Park Dr.	Tucson	AZ	85710
Meyer	Roger L.		7262 E 29TH ST	Tucson	AZ	85710-5758
Monzel	Peter	741-2151	3340 S. Placita San Marcial	Tucson	AZ	85713
Mortazari	Massoud	326-0057	1600 E. Roger Rd. #27	Tucson	AZ	85719
Mumme	Robert	792-3886	4352 E. Bryn Mawr Rd.	Tucson	AZ	85711
Myers	Nancy & Jeff	744-6021	8982 N. Lattimore Ln.	Tucson	AZ	85741
Nakamura	Michael	624-3372	132 E. Deland St.	Tucson	AZ	85705
Nault	Ben		3109 N. Laurel Ave	Tucson	AZ	85712
Niehaus	Duane & Sharon	797-4189	9861 N Windwalker Trail	Tucson	AZ	85741
Nishimoto	Glenn	321-4737	3071 N. Sparkman Blvd.	Tucson	AZ	85716
Nyberg, D.P.M.	Rob	745-2222	5969 E. Rosewood	Tucson	AZ	85711
Nye	Derald	762-5504	10385 E. Observatory Dr.	Tucson	AZ	85747
O'Connell	Brian	888-8952	3700 N. Fairview Ave. #109	Tucson	AZ	85705
Oesper	David A.	232-8705	1208 Wilson Ave.	Ames	IA	50010
Oliver	Jim & Karen	885-7040	2922 S. Harrison	Tucson	AZ	85730
Olson	Robert E.	577-1050	4641 N. Camino Campero	Tucson	AZ	85715-6321
Parten	Matt	747-0993	7826 E. Silver Beech	Tucson	AZ	85730
Piggott	Edward J.	529-6137	P.O. Box 64120	Tucson	AZ	85728-4120
Polacheck	John	544-4644	PO Box 299	Cortaro	AZ	85652
Pomeroy	J.A.	825-9363	14654 N. Spanish Garden Lane	Tucson	AZ	85737
Price	Ronald S.	577-1056	5720 E. Camino Del Tronido	Tucson	AZ	85715
Quiroz	Randy		1608 S. Treat Ave.	Tucson	AZ	85713-2115
Rainville	C.J.	749-5092	10531 E. Oakwood Dr.	Tucson	AZ	85749
Repp	Terry & Nancy		10408 E Flintlock Trail	Tucson	AZ	85749
Retallick	Martha J.		Box 43161	Tucson	AZ	85733
Riggenbach	Jorga	749-2710	3531 N. Via San Jacinto	Tucson	AZ	85749
Rosenbaum	Gary	579-0185	4131 W. Orangewood Dr.	Tucson	AZ	85741
Rostash	Rudolph	749-9517	2720 N. Conestoga Ave.	Tucson	AZ	85749
Roth	Herbert		8419 N. Calle Tioga	Tucson	AZ	85704
Saber	Ingrid		6322 N Barcelona Lane	Tucson	AZ	85704
Salzman	Joseph	296-4023	6609 E. Crimson Sage Dr.	Tucson	AZ	85715
Saway	Ray		5009 N. Sunriver Cir. #49	Tucson	AZ	85704
Saumon	Didier	326-7547	2929 E. 6th St. #106	Tucson	AZ	85716
Schlottman	Keith	290-5883	9581 E. Calle Cascada	Tucson	AZ	85715
Schultz	Rudy	297-5857	1200 E. Silvertree Dr.	Tucson	AZ	85718
Sevinsky	Robert	825-2546	14921 N. Appleton Ave.	Catalina	AZ	85737
Sevinsky	Russell	297-6344	1400 W. Placita Del Rey	Tucson	AZ	85737

Last Name	First Name	Phone	Address 1	City	St	Zip
Shea	Michael	721-8578	1345 South Kolb #129	Tucson	AZ	85710
Skinner	Byron R.		14495 Amilaur Dr.	Tucson	AZ	85747
Smeaton	Robert	327-0350	3447 E. Bunell St.	Tucson	AZ	85716
Smith	Michael S.	299-0122	6715 N. Table Mtn. Rd.	Tucson	AZ	85718
Smith	Stephen B.		Box 5056	Hucchuca City	AZ	85616
Solomon	Larry & Nancy	743-7924	4900 W. Jojoba	Tucson	AZ	85745
Spaeth	Jan & Paul	297-4131	7200 N. San Anna	Tucson	AZ	85704
Spitz	A.H.		5246 N. Paseo Del Arenal	Tucson	AZ	85715
Sprei	Stanley	577-7496	1070 64th St Apt 5	LaGrange	IL	60525
Stamm	Jim	575-0830	11781 N. Joi Dr.	Tucson	AZ	85737
Standage	Ron	836-8967	531 E. Judi Dr.	Casa Grande	AZ	85222
Stannus	Bernie	297-8041	8215 N. Oracle Rd. #14	Tucson	AZ	85704
Stepp	Larry	297-6312	1971 W. Placita Tampico	Tucson	AZ	85704
Stokowski	Ed	296-4774	114 N. Avenida De San Ramon	Tucson	AZ	85710
Stoltz	Bruce		3010 N. Palomino Park Loop	Tucson	AZ	85712
Stone	Sigmund	299-3723	4372 N. Vereda Rosada	Tucson	AZ	85715
Straub	Christopher	795-3128	1633 N. Bently Ave	Tucson	AZ	85716
Stravis	Joe	770-1751	3003 W. Broadway Trail 85	Tucson	AZ	85745-2533
Strittmatter	Donald J.	299-2304	4110 E. La Paloma Dr.	Tucson	AZ	85718-1506
Sweetman	Michael	297-2781	2961 W. Katapa Trail	Tucson	AZ	85741
Taylor	Heidi	299-5763	6651 N. Campbell Ave. No 185	Tucson	AZ	85718
Tekatch	Bill		19 Pheasant Place			
Terenzoni	Michael	577-6857	380 E. Calle Arizona	Tucson	AZ	85705
Thomas	Lincoln B.	325-4211	3232 N. Tucson Blvd. #212	Tucson	AZ	85716
Tickner	Bill	749-1555	8842 E. Driftwood Trail	Tucson	AZ	85749
Trexler	James	625-1216	1921 S. Abrego Dr.	Green Valley	AZ	85614
Trimbell	James	648-1526	4191 Campina Court	Green Valley	AZ	85614
Trueblood	Mark & Pat	455-9263	P.O. Box 797	Sonoita	AZ	85637
Trueblood	Ralph	574-5459	8701 S Kolb Rd Box 18-199	Tucson	AZ	85706
Turner	Gayle	458-2209	P.O. Box 1802	Sierra Vista	AZ	85636
Urias	Tony	327-3854	2504 E. 3rd	Tucson	AZ	85716
Van Wyngarden	Jerry	(303)434-8159	311 W. 6th St.	Ajo	AZ	85321
Vega M.D.	Luis Eduardo	747-9323	420 S. Essex	Tucson	AZ	85711
Velasquez	George S.	742-7256	3011 W. Placita Bernardo	Tucson	AZ	85745
Velkoff	Stephen & Barbara		8701 S Kolb Rd	Tucson	AZ	85706
Vreeland	Albert	749-9242	9261 Moenkopi Trail	Tucson	AZ	85749
Wagner	John	743-7997	1538 Plaza de Lirios	Tucson	AZ	85745
Wall III M.D.	Dr. Robert	881-8100	3640 N. Allwood Place	Tucson	AZ	85715
Walsh	Bruce	325-7457	2365 E. Seneca St.	Tucson	AZ	85719
West	Richard & Kathy	574-0830	70 W. Forrest Feezor	Tucson	AZ	85747
Westmoreland	Willie		Box 2372	Arizona City	AZ	85223
Wickersham	Betty	743-0008	3605 N. Camino De Oeste	Tucson	AZ	85745
Wilnot	James C.	747-1419	7352 E. 38th St.	Tucson	AZ	85730
Wilson	Larry	299-6608	3818 E. Diablo Canyon	Tucson	AZ	85718
Wilt	Nelson	883-6669	3035 S. Sheila	Tucson	AZ	85746
Wlasiuk	Michael D.	795-6157	2117 N. Bell Ave	Tucson	AZ	85712
Yolanda Yubeta	Education Directo	741-3164	Federal Correctional Inst.	Tucson	AZ	85706
Zajac	John	299-3203	5051 N. Sabino Canyon Rd. 2146	Tucson	AZ	85715
Zimmerer	John	529-2207	4561 N. Arroyo Vacio	Tucson	AZ	85715
Ziolkowski	Lea A.R.	529-2062	6961 N. Solaz Tercero	Tucson	AZ	85718
Zumbrunnen	John & Kathleen		5417 E. 28th St.	Tucson	AZ	85711

## OBSERVER'S REPORT

December turned out to be a cold month for observing. Clear weather resulted in temperatures below freezing for both the Pozo Nuevo star party on the 4th and for those who ventured out of town to see the Geminid meteor shower. Glenn Nishimoto's chocolate covered macadamia nuts helped the 10 members at the Pozo Nuevo party stay warm; Thanks Glenn! Cold clear weather also prevailed for the peak nights of the Geminid meteor shower. Although I was behind a guiding eyepiece and did not actively observe the shower, I can say it was a good one. When not looking into red crosshairs I observed several bright meteors each hour, and many more faint ones, giving me the impression of a shower every bit as good as this year's Perseids. If you observed the shower and recorded individual meteor counts please tell me at the January meeting. Photos are also welcome.

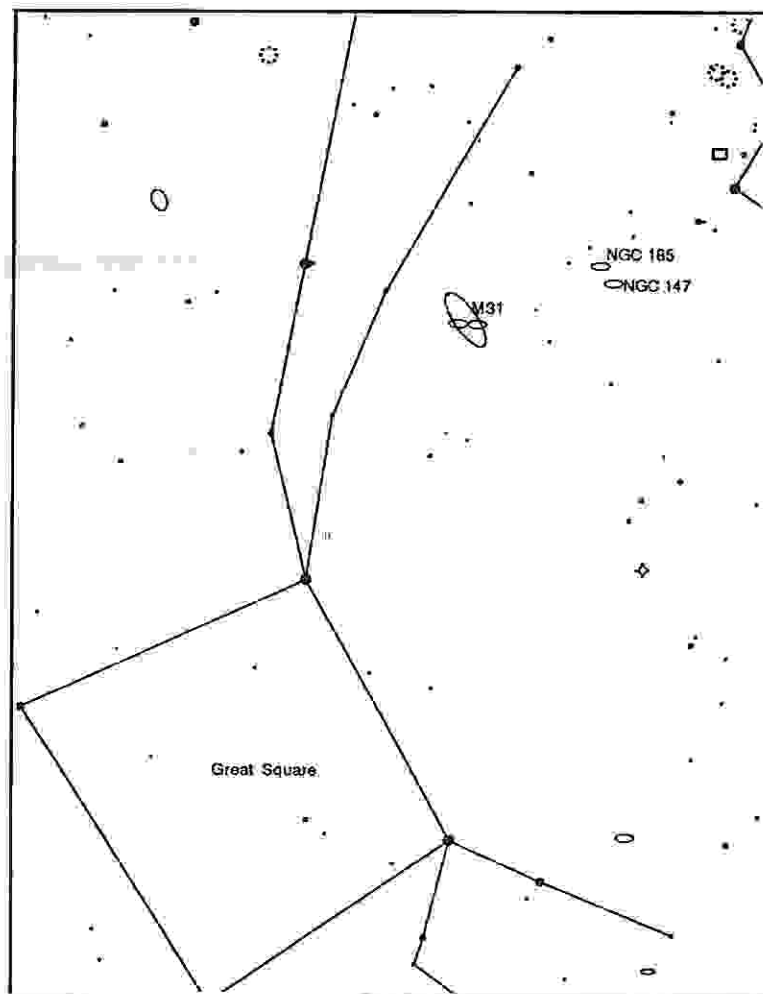
The lunar "Eclipse Party" held in front of Flandrau Science Center proved to be a smashing success both for the TAAA and the Science Center. Media coverage was fantastic and several club members (including this writer) found themselves on live TV! In addition, a favorable *Tucson Weekly* article about the club and the eclipse featured quotes from Vice-President Terri Lappin and a photo of Ed Blair with his folded Newtonian. I personally wish to thank everyone who attended this event to make it a success and also wish to relay many thanks from Flandrau Science Center. Flandrau staff members were quite enthused with the support the club gave and wish to link up with us to do this sort of thing again. Already there's talk of the annular eclipse in May and how we can best promote science and safety while obtaining support for our 30" observatory plans. If you have any ideas please let any of the executive know at a meeting!

Last month I talked about the two largest member galaxies of the local group, M31 and M33. This month I wish to extend this discussion to two satellite galaxies of M31 not usually on observer's search lists: NGC's 147 & 185. NGC 147 and 185 are dwarf galaxies in Cassiopeia just 58 arc minutes apart. Located 7 degrees north from M31, you can see both in the same field but use a low power eyepiece and a medium aperture telescope. NGC 185 glows dimly at magnitude 11.5 while NGC 147 is a more difficult find at magnitude 12.1. Both are elliptical galaxies, so here's how to distinguish them: NGC 185 is round while NGC 147 appears elongated. If you are familiar with the classification scheme for ellipticals (E0 being perfectly round while E7 is very elongated and lens shaped), then knowing that NGC 147 is E1 while NGC 185 is E4 might help.

What makes these galaxies appealing is not their appearance of course (ellipticals are

probably the least interesting galaxies to observe) but the fact that they are dwarf satellites of M31, just 2.2 million light years away. Resolution of both systems into stars was accomplished with both the 100-inch and 200-inch reflectors in California using photographic plates sensitive to red light. Both galaxies are among the faintest yet observed (M31 is over 2000 times more luminous!). Knowing that all five lie at the same distance from us helps to graphically visualize brightness and size relationships among them, especially if you use the same eyepiece to observe all five. So, when you observe M31 next time try to observe its entire system, not just M32 and M110. To help your search I've included a chart below. Until February; Clear skies!

Michael Terenzoni



**THE SKY FROM TUCSON**  
**LOOKING NORTHWEST**  
**JANUARY 15, 8:30PM**

The following anecdotes are from attendees of last year's Grand Canyon Star Party. One of their few rewards is receiving **Desert Skies**, and they have the following submissions.

## Halloween Astronomy Project

Following up on the Halloween astronomy project suggested by Teresa in a recent issue of **Desert Skies**, we told both the Ogden Astronomical Society (OAS) and the Salt Lake Astronomical Society (SLAS) about the idea. Both clubs were excited about trying it. These are the results of our own personal experience on Halloween.

Deloy and I set up two telescopes for the trick-or-treaters on Saturday night. One was a 6" f/5 reflector and the other was a 4" f/15 refractor. We were able to spot Saturn about 6:30 and put the refractor on it for the night. In the reflector we had planned on the moon, but since it wasn't up we aimed it on Albireo (the Cub Scout Star) in Cygnus. The scopes were set up before the kids started coming for Trick or Treat. The treat we were giving was a miniature Milky Way bar.

It was fun to see the kid's reaction when they looked through these scopes. Some of the older ones thought we had a picture of Saturn in the scope and they were just looking at the picture rather than the real thing. We heard lots of terms like "Rad", "Awesome", "Neato", etc. We were also told several times that "we were giving the neatest treat because our treat was letting them see through the telescopes." It was comments like this that made it worth while for us to do it.

Some of the kids wanted to know if we were going to look at other stuff. When I told them that when the moon came up I would point the 6" at it they asked if it

would be okay if they came back. I told them they could if they would be honest and not take another candy bar when they returned.

Some of the kids that lived close by came several times "just to look again." When it seemed to be the end of the kids, we went and got a neighbor couple who had just moved in a month ago to look. They seemed excited and glad we had invited them over to look.

I know of two different groups that came back to look at the moon (because of the high mountain to the east and a big tree, we did not get a good look at the moon until about 9:15pm). The kids had gone home and insisted that their parents and other neighbor kids came to see the stuff in the telescope. We started taking down the scopes at about 9:45.

The temperature was probably between 47 and 40 degrees that night while we were out. The skies were very clear that night and Sunday it was quite overcast.

We counted 65 kids who looked through our scopes (this is counting them twice if they came back later with more people). We felt like this was a good number since our house is located on a street that does not have many houses. It was almost out of the way for kids to come to our house. We felt like it was a great success and will plan on doing it again weather permitting.

-Karen and Deloy Pierce, Salt Lake City, Utah.

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## Space Shuttle Landing

West Coast shuttle fans got a real "treat" the morning after Halloween--a chance to see Columbia land at Edwards Air Force Base after spending two weeks in orbit. Regularly scheduled landings at Edwards are somewhat of a rarity these days. But the weight of the Space Lab Module carried on board made a Florida landing unlikely for STS-58. With close to maximum payload weight, Columbia would need all the stopping room she could get!

My wife Kyra and I had always wanted to see a shuttle landing. My buddy Gary had just bought a used RV so he was ready to take a road trip too. We drove down Sunday and set up my telescope for a star party that evening. A crowd of about 25,000 people was slowly assembling for the big event Monday morning. We parked next to a guy from San Jose who had NASA Select on his TV so everyone passing by could get a mission update, a look at Saturn and a big, bright desert moon. We awoke at 4:00 am and staked out prime seats at the viewing area. I planned to take video of the landing to show to my Project Astro classes Tuesday morning. We saw Venus rising in the east just ahead of a glorious red sunrise through the distant clouds. We had clear skies and no winds; so all was go for touch down of Columbia at 7:07 am.

The public address system crackled to life bringing the air to ground transmission between the shuttle and controllers in Houston. Passing over the California coast, just south of Monterey, the shuttle streaked out of the west

illuminated by the morning sun and flew over us to ready for it's final approach. A moment later the trademark double sonic boom brought another standing ovation from the crown of onlookers. After making a wide left turn, Columbia returned to view as an ever-growing black dot in the northeast. Silently she approached the runway for a picture perfect landing and a rousing cheer from all. Before Columbia had wheeled to a stop the National Anthem came blasting through the p.a., heralding a successful end to a record breaking shuttle mission to study the effects of zero G on the human physiology.

After a hearty breakfast we made our way to the Dryden Flight Research Facility Visitor's Center on base, and saw mockups of some of the X-series aircraft which were instrumental in the later design of the shuttle. I spent about \$85 at the gift shop--hey, everyone needs a NASA frisbee or shotglass, right? Everyone at Edwards was very helpful and friendly. The whole event was well organized. The Visitor's Center gives tours weekdays at 10:15 am and 1:15 pm. Please call ahead if you're ever planning to be in their neighborhood. No tours on shuttle landing days, however.

-Barry Hirrell, San Francisco, California



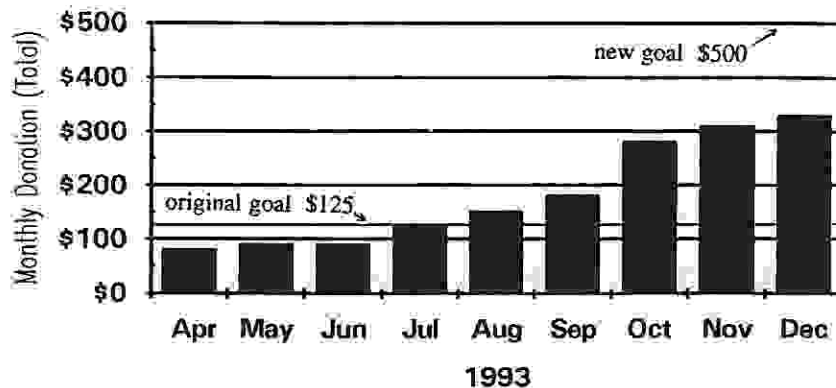
## Fundraising News

The TAAA has been very successful in its fund raising efforts during 1993. Our total donations have been about \$5500 with over \$4500 in just the last 6 months. We are to congratulate the members of the TAAA and Friends of Flandrau for their support in raising this money for the Land & Telescope Fund. We are still in negotiations for the site in the Buenos Aires Refuge...we still need to raise more money before we can buy the site.

Our Automatic Donation Program is doing better than we had hoped for. This program allows members to spread a donation to the TAAA out over a year. It is easy to participate: fill out a form stating how much you want to contribute monthly and the transfer is done electronically between our bank and yours. The automatic deduction will show up on your monthly statement. At the end of the year the TAAA will send you a note telling you the total given during the year. We ask that the minimum be \$5/month.

From the chart below, you will see that we have surpassed our initial goal of \$125/month set back in April. We have set a new goal of \$500/month which we hope to attain by June 1994. Currently we have 16 members (less than 10% of our membership) giving an average of \$20 each every month, giving us a total of \$330/month. Using this average of \$20 per participant means just 10 more members will put us over our current goal. We know we can do this. If want to help us out, fill out the form. (If every member took part at an average of \$20 each, the TAAA would receive donations of \$4000 each month!) Many thanks to those taking part in the program - Steve Alden, Ed Blair, Dean Ketelsen, Herb Roth, Eduardo Vega, Bob Goff, David Harvey, Dick West, Terri Lappin, Greg Johnson, Larry Soloman, Andrew Meyer, Brad Becker, Mike Terenzoni, Art Hoag and Mike Finerty.

Automatic Monthly Donation Program  
as of Dec 15, 1993



TUCSON AMATEUR ASTRONOMY ASSOCIATION  
AUTHORIZATION FOR AUTOMATIC PAYMENT  
P.O. Box 41254  
Tucson, AZ 85717

Please attach voided check

I (we) hereby authorize the above named organization and the below named financial institution to initiate debits to the account indicated below for payment of periodic contributions in the amount of \$ \_\_\_\_\_ per month to the Tucson Amateur Astronomy Association's Land Development Fund.

FINANCIAL INSTITUTION NAME \_\_\_\_\_  
ACCOUNT NUMBER \_\_\_\_\_ BRANCH NAME \_\_\_\_\_  
BRANCH ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
MEMBER NAME \_\_\_\_\_ SOCIAL SECURITY NO. \_\_\_\_\_  
MEMBER'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

CANCELLATION PROCEDURE: Please provide written notice to our post office box address at least 10 days prior to the cancellation effective date.

### **TAAA Executive Meeting Minutes - 9 December, 1993**

Present were Dean Ketelsen, Derald Nye, Tim Hunter, Bob —, Larry Wilson, John ZumBrunnen, Bob Goff, David Harvey, Duane and Sharon Niehaus, Teresa Lappin, and Gary Rosenbaum. Meeting called to order at 7:35.

**1. Land Issues** - The search for land continues. Though withdrawing from the Pozo Nuevo site, we are awaiting word from them regarding renegotiation. This continues to be our preferred site until we hear that definitely will not lower their price. In addition to that site, others of interest that are available are the Trueblood site, who notified us that they are willing to hold both sites for us should we buy one of them and arrange some deal for the other, and the Tucson Soaring Club site. Tucson Soaring Club leases 640 acres from the government with a 20 year lease. They have developed the site with a triple wide trailer for a clubhouse, plumbing and a full time caretaker. They have generator power. Dean visited the site (~15 miles west of I-10 on Avra Valley Rd) and it displayed potential. It had a very dark sky, some glow from Tucson to the southeast and Phoenix from the north. The major pitfall is that it is the flightpath from Phoenix to Tucson and there are planes flying nearby. The Soaring Club will discuss possible requirements from us at their next business meeting. The executive may plan a visit soon.

**2. Fundraising News - Raffle** - The raffle drawing was held at the December meeting and was won by Tim Gaddis. The club raised \$377 from 64 people buying 222 tickets. There is some thought that we should have more raffles and door prizes using less expensive prizes. Automatic Donation Program - This program is currently bringing in \$330. Though 16 are signed up, nearly half of the amount is coming from only two members. The fund is increasing every month,

however. Other - We need to renew the membership in the Tucson Convention Bureau if we have not done so. The \$150 investment brought in more than twice that from two star parties with convention groups. George Velasquez is working on a club pamphlet for schools and potential sponsors. The "light buckets" that Bob Goff put together for the lunar eclipse brought in \$15.40 in donations.

**3. After School Activities** - Sharon filled us in on the school program she has been running. The 9 week program for the Marana district is finished. Starting in January she will be running programs in both Marana and Catalina schools. She will write a report for the newsletter describing activities and requesting assistance.

**4. Treasurer's report** - With recent donations our funds have grown considerably, though the size of the "land fund" has still not been established (some ambiguity introduced several years ago), but will be resolved soon. Money market savings (considered by some to be land fund) is \$16,160. Total funds are \$21,315.

**5. Meeting Format Change** - the response from the last general meeting considering a change to two meetings a month was pretty evenly split between formats. For the moment, the format will remain unchanged.

**6. A.L. News** - No news.

**7. Other business** - Gary will set up either a Steward scope or arrange others for observing the eclipsed star in the Trapezium during the January 7 meeting. 1994 marks the 40th anniversary of TAAA. Several ideas were discussed to celebrate - a possible banquet, a high-profile speaker, color commemorative newsletter. Ideas will be requested from the membership.

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### **Desert Skies Classified**

**Want to Trade:** I am interested in trading my Celestron 11X80 binoculars for a pair of 20X80 binoculars. If interested, call Gilbert Friedman at 571-1662.(1-94)

**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).

**For Sale:** Celestron CG11 like new, complete with eyepieces, flight cases, 2" diagonal, electric focus, computer. Make offer. Uncompleted 16" f/6 telescope - needs rocker box. Ground mirror needs refinishing. Custom mirror case, Novak low profile focuser - \$400. David Evans (415) 873-0423.

Your ad will run for 4 months unless specified. Month and year of last appearance is last item of ad. For additions or changes to this list call Dean, 293-2855.

# DARK SKIES for Tucson (in MST)

1994 JANUARY no twilight  
no moonlight

Sa/Su	1/ 2	6:58pm - 9:46pm
Su/Mo	2/ 3	6:59pm - 10:49pm
Mo/Tu	3/ 4	6:59pm - 11:54pm
Tu/We	4/ 5	7:00pm - 12:59am
We/Th	5/ 6	7:01pm - 2:04am
Th/Fr	6/ 7	7:01pm - 3:10am
Fr/Sa	7/ 8	7:02pm - 4:14am
Sa/Su	8/ 9	7:03pm - 5:15am

Su/Mo	9/10	7:04pm - 5:59am
Mo/Tu	10/11	7:04pm - 5:59am
Tu/We	11/12	7:05pm - 5:59am
We/Th	12/13	7:06pm - 5:59am
Th/Fr	13/14	7:47pm - 5:59am
Fr/Sa	14/15	8:44pm - 5:59am
Sa/Su	15/16	9:40pm - 5:59am

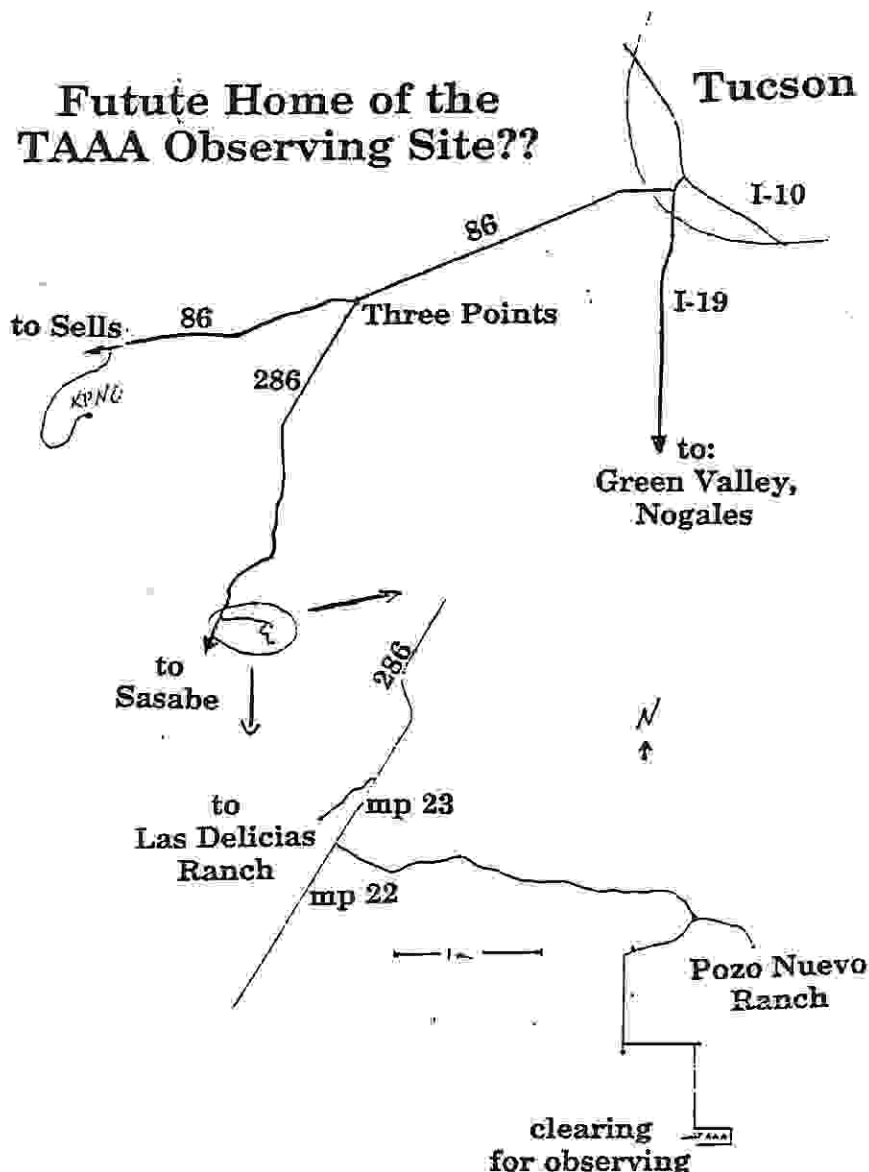
Su/Mo	16/17	10:34pm - 5:59am
Mo/Tu	17/18	11:27pm - 5:59am
Tu/We	18/19	12:21am - 5:59am
We/Th	19/20	1:15am - 5:59am
Th/Fr	20/21	2:09am - 5:58am
Fr/Sa	21/22	3:03am - 5:58am
Sa/Su	22/23	3:57am - 5:58am

Su/Mo	23/24	4:49am - 5:58am
Mo/Tu	24/25	5:39am - 5:57am
Tu/We	25/26	- - -
We/Th	26/27	- - -
Th/Fr	27/28	- - -
Fr/Sa	28/29	7:19pm - 7:33pm
Sa/Su	29/30	7:19pm - 8:39pm

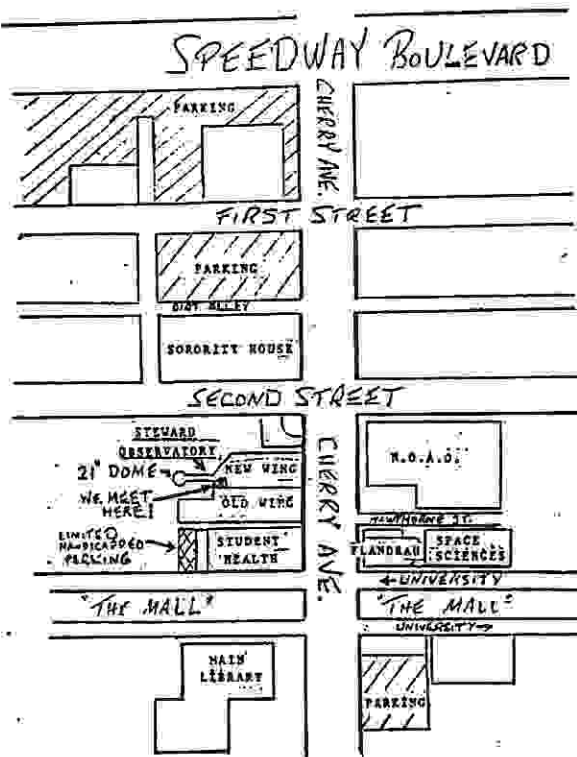
Su/Mo	30/31	7:20pm - 9:45pm
Mo/Tu	31/ 1	7:21pm - 10:51pm

Erich Karkoschka

## Futute Home of the TAAA Observing Site??



## TAAA Meeting Location



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