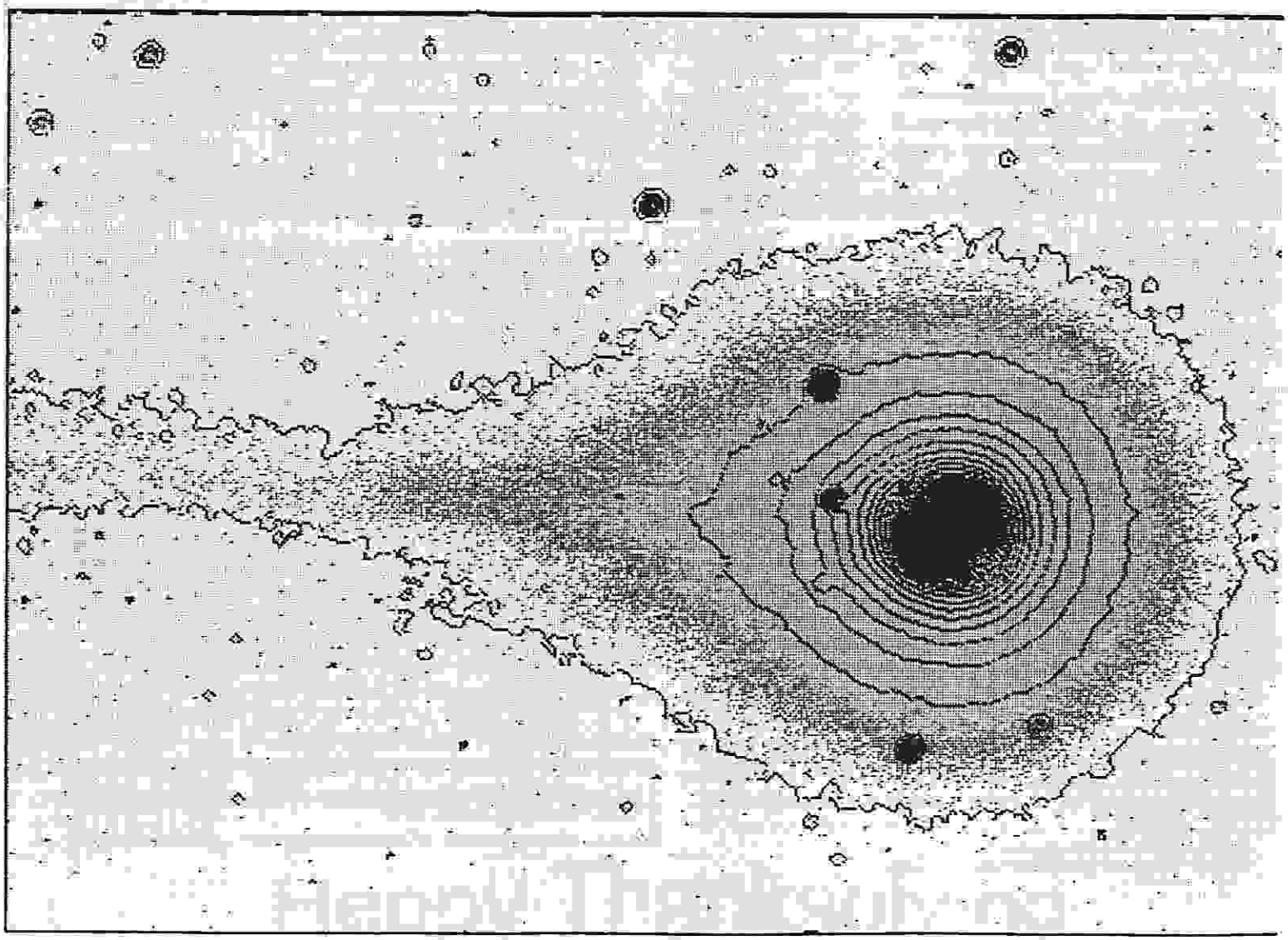
Desert Skies

Tucson Amateur Astronomy Association

Volume XLI, Number 11 **November, 1995**

Comet DeVico



COMET DEVICO. VEGA-BRAY OBSERVATORY, SEPT.24,1995, 4.09 AM. VEGA/KET.

Calendar of Events

BEGINNERS LECTURE - Friday, November 3, 6:30 pm at the Steward Observatory Auditorium - room N210. Topic is **Can You Prove The Earth is Round?** by John and Josh Polacheck. All are welcome!

GENERAL MEETING - Friday, November 3, 7:30 pm at the Steward Observatory Auditorium -room N210. Topic is **Quasar Surveys: Finding Needles in Haystacks** by Craig Foltz.

YOUNG ASTRONOMERS CLUB - Friday, November 3, 7:30 pm at Steward Observatory room 202. Aimed at school-age kids and is concurrent with the general meeting.

EXECUTIVE COMMITTEE MEETING - Tuesday, November 7, 7:30 pm at Steward Observatory, Room N305. Latecomers can call 621-2607 and we can let you in.

STAR PARTIES & EVENTS:

Oct 30 - Steward Obs Public Lecture
Nov 6 - Sunrise Elementary School Star Party
Nov 18 - Chiricahua Campout & Star Party
Nov 18 - Empire Ranch Dark Sky Observing
Nov 25 - Empire Ranch Dark Sky Observing
Nov 27 - Steward Obs Public Lecture
Nov 27 - Donaldson Elementary School Star Party

Newsletter Schedule: Deadline for articles: Monday, 11/13/95. Printing: 11/20/95. Folding: 11/21/95. Mailing: 11/22/95.

Cover: CCD image of comet DeVico provided by Ed Vega and Dean Ketelsen. Picture was taken September 24th, 1995 at 4:06 am through the 20" f10 Maksutok Cassegrain (made by Max Bray) at the Vega-Bray Observatory. They used an AX-2 Viper CCD camera with a Kodak 1600 sensor and Mira Professional imaging software. (Both camera and software are the product of Mike Newberry from Tucson.)

TAAA Home Page: http://www.primenet.com/~lwilson/taaa/taaa.html

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Membership in the TAAA
Individual $25.00/year
Family $30.00/year
Senior Citizen (over 60) $23.00/year

Sky & Telescope subscription (optional) $24.00. 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

Send Address Changes to:

TAAA
Attention: "ADDRESS CHANGE"
P.O.Box 41254
Tucson, AZ 85717

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. If you want Sky & Telescope:
   a) add $24 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.

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
c/o Nina Lehman
PO Box 91316
Tucson, AZ 85752-1316

OR email: Nina Lehman at 74750.247@compuserve.com

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President's Message

Today the TAAA has about 250 members, but I can remember when we had around 60 members. I joined the TAAA back in 1978 after having successfully completed my 6" telescope with the help of TAAA members. Like most new members I attended the meetings, but believe me, a high school student (female at that) didn't really fit in. I had not much more than a basic understanding of the lectures and had absolutely nothing to contribute. Other than attending a star party there were few opportunities to really learn astronomy. Trying to learn the night sky and how to operate my new 6" telescope was a "you'll catch on" experience. I am glad things have changed since then.

When a new member joins the TAAA, they now receive a Member's Pack. It contains a map to the star party site and a constitution, but it also contains very valuable items for someone new to astronomy. There are flyers like Sky & Telescope's "Getting Started in Astronomy" and a star chart from Astronomy Magazine showing all the Messier Objects and some NGC objects too. Hopefully, our member's packet helps new amateurs with a few tips on observing and lets them start learning the night sky from their own back yard...on the very same night they joined if they want to.

After belonging to the TAAA for a few years, I got drafted into the position of Treasurer. As the treasurer for many years following, I became very aware that a good portion of our members were not renewing their memberships, especially those who had joined for only one year. We were able to keep most of the well seasoned amateurs, but weren't retaining those who had just been bit by the astronomy bug and hadn't yet suffered their first round of 'aperture fever'. There appeared to be a gap between what our new members wanted and what we were offering. Since our membership has grown so significantly over the past decade, I think we are doing things right.

The Beginner's Lectures are one of the things that I felt were desperately needed by those needing basic astronomy instruction. The lectures aren't meant to be part of a college course in astronomy. They are meant for members who want to learn something. I am very delighted that so many people enjoy the lectures and that I have had such a good response in asking for volunteers to give the lectures.

And what about the contributions a new member can make to the TAAA? The activities of the TAAA when I joined were rather limited compared to today. There was a monthly lecture, one star party, and an occasional work day when some job was performed on the 16" which the TAAA was building. I remember attending a 16" work day. I had no idea what sandblasting was about, but I showed up just to see the telescope. I didn't do anything! Several years later, there was a painting party, so I swung a paint brush for an afternoon!

Today, we have more than enough star parties for everyone to get involved. Both at a dark site and at area schools. I really get the most out of the TAAA during the school star parties. Nothing beats showing young and old the moon or a planet through my telescope! Members just learning how to use a telescope can help. It isn't that difficult to find the moon, and with the number of new telescopes with computer control available these days, even a novice can find M81 or M82 easy enough.

Other ways members can make a contribution is by writing an article for the newsletter, serving on the education committee or helping out with the Young Astronomers Club. With the expected activity on the 30" telescope, there will be opportunities to help out with that project. One very easy thing members can do is to provide refreshments for our meetings. It usually costs somewhere around $25 and requires some muscle to haul the cookies and drinks to the meeting, but this simple act makes the meeting very enjoyable by all by providing a time for socializing and a chance for some shop talk.

So, if you're new to the TAAA or have been a member for a long time, think about how you can get more out of your membership. If you think the TAAA isn't offering what you want, tell me about it. Maybe we can change things for the better.

Clear skies,

Terri *

Happy Thanksgiving

Meeting News

Beginner's Lecture: Can You Prove The Earth Is Round?

JOHN AND JOSH POLACHECK

Obviously the Earth is round, but there are some surprising consequences thereof. John and his son Josh will review some of the historical accounts of this discovery, including those of Columbus and will explain possible ways for TAAA members toactually measure the Earth's diameter over the next year–several possible methods exist. *

November's Speaker: Craig Foltz

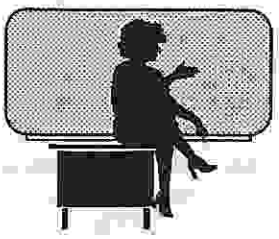
Craig Foltz is the deputy director and a staff astronomer at the Multiple Mirror Telescope Observatory (MMTO). Craig will be presenting his lecture "Quasar Surveys -- Finding Needles in Haystacks" at our November 3rd meeting. Craig's area of interest is the nature and distribution of quasars and the nature of the intergalactic medium. He uses such instruments as the MMT, the VLA, ROSAT and the Hubble Space Telescope in his research. If there is time, Craig will talk about the current and future plans for the MMT upgrade to a single 6.5m mirror.

Craig received a Bachelors Degree from Dartmouth College in 1974 and a PhD in Astronomy from Ohio State in 1979. Coming originally from New Jersey, Craig says he almost never saw stars while growing up. It wasn't until he went to college in New Hampshire that he began thinking about a career in astronomy.

If you have access to the Web, take a look at Craig's handiwork as he maintains the home page for the MMTO:

http://sculptor.as.arizona.edu/foltz/www/mmmt.html.

Craig claims to have a "really cool archive of Bulldog pictures" on his personal home page which can be reached through the Steward Observatory home page via the MMT page. *



Young Astronomers Club

BY NINA LEHMAN

Due to health problems, I have been having a hard time getting to meetings. I don't want the kids to become discouraged, so I am asking for volunteers to cover some of the months. I want to do the November and December meetings, then switch to doing every third meeting: I will do January, April, July, and November, while volunteers handle Feb., March, May, June, Aug., Sept, Nov. and Dec. I can handle coordinating the volunteers and provide emergency backup. Our kids put a lot of effort into learning about the sky and writing up their observations. Please volunteer some time to keep this worthwhile program viable. If you can help, contact me at 579-1382 or by email: 74750.247@compuserve.com *

Steward Observatory Public Evenings

These lectures are held in room N210 at 7:30pm on the dates listed below. The lecture and Q&A period lasts for about one hour. Following the lecture the Steward 21" telescope will be made available for viewing the night sky (weather permitting). Telescope operators are from the University Astronomy Club.

October 30	Dr. Julio Navarro (Bart J. Bok Fellow)	Formation and Transformation of Galaxies
November 13	Veteran's Day, no lecture	
November 27	Mr. Aditya Dayal	The Birth and Death of Planetary Nebulae

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Club News

Looking for a CPA

Thanks to the efforts of Gary Rosenbaum our financial records have been computerized. We are now looking for a volunteer CPA in the TAAA who can look over the system that has been established and make suggestions if necessary. Eventually, we will want an independent accounting of our finances performed. Having a CPA look at our procedures and offer suggestions now should make it easier for an independent accounting to be performed at a later date. *

1996 Astronomy Calendars

The 1996 calendars are selling fast! This may be your last chance to get one at the great price of $8 each (list price $10.95). The "Exploring the Universe 1996" wall calendar makes a great gift too! Each month features an astronomical photograph or artwork. Astronomical trivia and celestial happenings are given for most dates as well as a 'Planets this month' box with information about the naked eye planets. We received a volume discount and proceeds from the sale of these calendars will go to TAAA activities.

We are also taking orders for the 1996 Astronomy & Space appointment calendar. This spiral bound book presents an entire week on one side and an astro or space photograph on the other side. These must be prepaid and delivery will be at the December meeting. The price is $11 each (list price $12.95). Orders will be accepted through the November 3rd meeting. *

Amateur Telescope Making Newsgroup

There is a telescope making newsgroup for amateur astronomers that has recently changed servers. You do not need World Wide Web (WWW) capability, only e-mail capability. This is a very useful forum for all aspects of telescope making. If you have a question, you get useful answers from experts who have been through it all, and there is an amazing amount of knowledge passed out along the way. The list will be up and running soon - to be a charter member with the new server, send a message to: majordomo@efn.org and for the body of the message, say "subscribe ATM" and you will be put on the list. The newsgroup generates lots of mail (useful if you like getting e-mail), and the last ATM newsgroup featured a digest version which sent you a list of all exchanges when they add up to a file 30K long or so. Anyway, I highly recommend it if you are at all interested in scope making, or for that matter, scope using. *

A Call for Astrophotos

BY JOHN KALAS

At the October monthly meeting, I presented a suggestion for a fundraising project. It solicits astrophotographs from the membership for the selection of six 8"x10" photos to be "sold" by members. The idea was well received with a majority of the attending members interested in supporting the project.

Up to five photos may be submitted for consideration by any member. The photos must be in print form, at least 5"x7" (preferably 8"x10") in size, color or black and white and processable from a negative. Submittals must be free of copyright restrictions. At the November 3rd monthly meeting, the submissions will be anonymously displayed for the review and appreciation of the membership. Members will select six photos which have the best sales appeal. It would be very helpful if members could bring the negative for each photo submitted. This will facilitate the speedy preparation of sales packs for distribution to members who volunteer to support the fundraising effort. The six 5"x7" photos in the sales pack will be available to the volunteering member at cost.

Although costing has not been finalized, the TAAA should be able to clear a minimum of $3.00 for each color photo and $3.75 for each black and white picture sold at a donation price of $5.00 per photo. With good support from the membership, this will be an easy and fun way to raise needed funds for exciting club projects such as building the mirror cell for the 30" diameter mirror.

Your help is needed. Please bring your astrophotos to the November meeting and/or volunteer to sell the photos during the fundraising campaign. If you are unable to attend the November meeting, give me a call at 620-6502 should you be interested in selling the photos. Thanks. *

UA Student Needs Workspace

It came to the attention of your editors that a student living in the dorm at UA is looking for a work space for working on an 8" mirror. He has a tube plus most supplies and tools for construction of same. Please call Rob Nero if you can help at 695-1919. *

Special Interest Groups

Computers And Electronics In Astronomy Subgroup

BY ROGER TANNER

The eighth meeting of the subgroup was held at Bob Goff's optics shop in Tucson just south of the U of A. He showed us the test setup he was using to test an extremely fast Hextex mirror, a 36" f .44. Later he showed the various optics he is working on in the shop. After that Bob showed us the mirror casting equipment at Hextex and how they make their super light mirrors. There were about 8 members present.

The mirror Bob was figuring and testing looked like a real salad bowl, the focal length was less than half the diameter. This would make a incredibly short telescope! Unfortunately the image quality would be terrible. Spherical mirrors have a problem called spherical aberration, which means the rays of light from the edges don't focus at the same point where the rays from the middle of the mirror focus. Doing a little trigonometry shows that for this mirror this difference in focus would be only about 19"!! So there would not be a focus in the traditional sense. After that I stopped hyperventilating at the thought of a really fast wide field CCD camera system that would fit in my trunk. Bob was in the final stages of figuring this mirror and was trying to eliminate two bumps in the mirror which were due to fabrication problems in the mirror. Hextex mirrors are formed by fusing two sheets of glass to a series of round tubes to form a cellular cored mirror. The tubes are expanded with gas while they are hot and soft to form a rough hexagonal shape. Then the mirror is reheated and slumped to the desired radius of curvature. This mirror had a severe amount of slumping to do, about 5.5 inches in the center. During this process, some of the tube walls supporting the mirror surface bent and are not as stiff as the rest. When the lap passes over them they deflect and don't get as much material polished off. They show up in the optical test as two high spots.

Bob had a interferometer set up which compares the shape of the mirror surface with a reference sphere. The test system used a Helium Neon laser for its light source. The beam was bounced off the reference sphere and the mirror being tested and the light recombined to give interference bands. The two beams were then viewed with a small CCD video camera and the picture displayed on a TV monitor. The intensity of light waves vary with a sine wave shape and where the reflected wave from the test mirror and the reference mirror were out of phase, destructive interference causes dark bands to appear on the image of the mirror. Each dark band represented a half wavelength of light error in the mirror surface being tested. The bands stretched across the mirror and formed sort of a topographical map of the surface. For the wavelength of light used each band represented about only .31 micrometer or about 12 millionths of an inch on the surface, which shows the sensitivity of the test. Bob had so far figured the surface to about three interference bands and this represented a surface accuracy of 36 millionths of an inch or 1.5 waves of light. This would be a poor tolerance for an astronomical mirror but was not far from the tolerance need for this non-astronomical application.

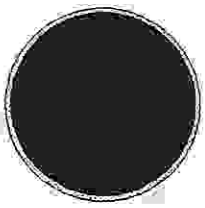
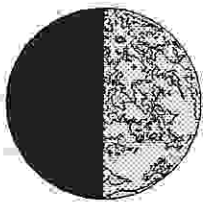
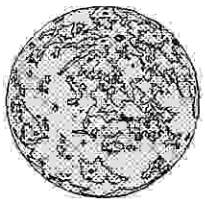
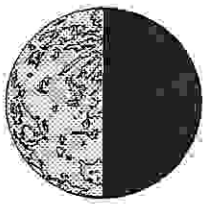
After looking at the surface profile visually, Bob used his IBM PC to analyze the surface quality. To do this he needed to make some additional adjustments in the test setup to allow the software to analyze the image. He adjusted the test system to add some tilt between the reference sphere and the test mirror. This added several lines of interference to the image on the screen. If the test mirror was a perfect sphere, the bands would be straight across the mirror. They were curved and bent out of shape by the surface errors, mostly by the two bumps on the surface. When looking at the original interference bands on the screen Bob has enough experience with mirrors to judge whether a circular interference band is a bump or a dip. The program is not able to do this because the a surface with a one quarter a wave bump will produce a dark band just as well as a surface with a quarter wave dip. By adding a lot of tilt each adjacent band will always represent a lower or higher surface profile with no reversals in the slope. The program can then remove the average slope mathematically and show the original bumps and dips. To capture the video image of the interference bands on the mirror Bob used a Snappy frame grabber and generated an image file in his computer. This image file was then used in a surface analysis program called QuickFringe to determine the quality of the surface. The user has to identify the bands to the computer by clicking the mouse cursor on the center of each band at several points across the mirror surface. The program then produces a image of the interference bands with the tilt removed. This matched the previous image Bob was visually analyzing fairly well. It generated the peak to valley and an average (RMS.) of the surface profile errors. When Bob took the image he placed some paper triangles on the edge of the mirror to identify the mirror orientation in the image. He could then see where the high spots on the mirror were that would get more polishing to remove them.

After that Bob showed us the various optics he is working on in the shop. One interesting set of mirrors are some thin octagonal mirrors for a particle physics experiment. These are about 12 but 15 inches with a very long radius of curvatures, about 60 feet. Bob uses a flat mirror at the other end of his shop to fold the beam in two so he can test them in his shop. There were several Hextex mirrors in the shop in various stages of fabrication.

Next Bob took us over to the Hextex casting facility in an adjacent building. Bob showed us the thin glass cylinders that become the hexagonal cores in the mirrors. Some of the mirrors they have made have only 1/4 inch thick face sheets and only 20 thousands of an inch thick walls in the glass tubes. There was a 20 inch mirror in the entrance display that weighed only 8 pounds, that is only 16% of even a thin mirror. They have made mirrors up to 100 inches in diameter with this technique.

The November meeting will be at NOAO where Frank Valdez will give a demo on the image processing program IRAF. This is the image processing program used by most of the professional observatories. Frank is one of the programmers who worked on the program and should be able to answer any question about it. The meeting is on Sunday, November 12 at 7:00 PM. Someone will be at the front entrance before the meeting to let you in. Thanks to Paul Brown for setting this up.

Contact Roger Tanner at 574-3876 or email:
rtanner@gas.uug.arizona.edu. *

Dark Skies for November

DARK SKIES for Tucson (in MST)

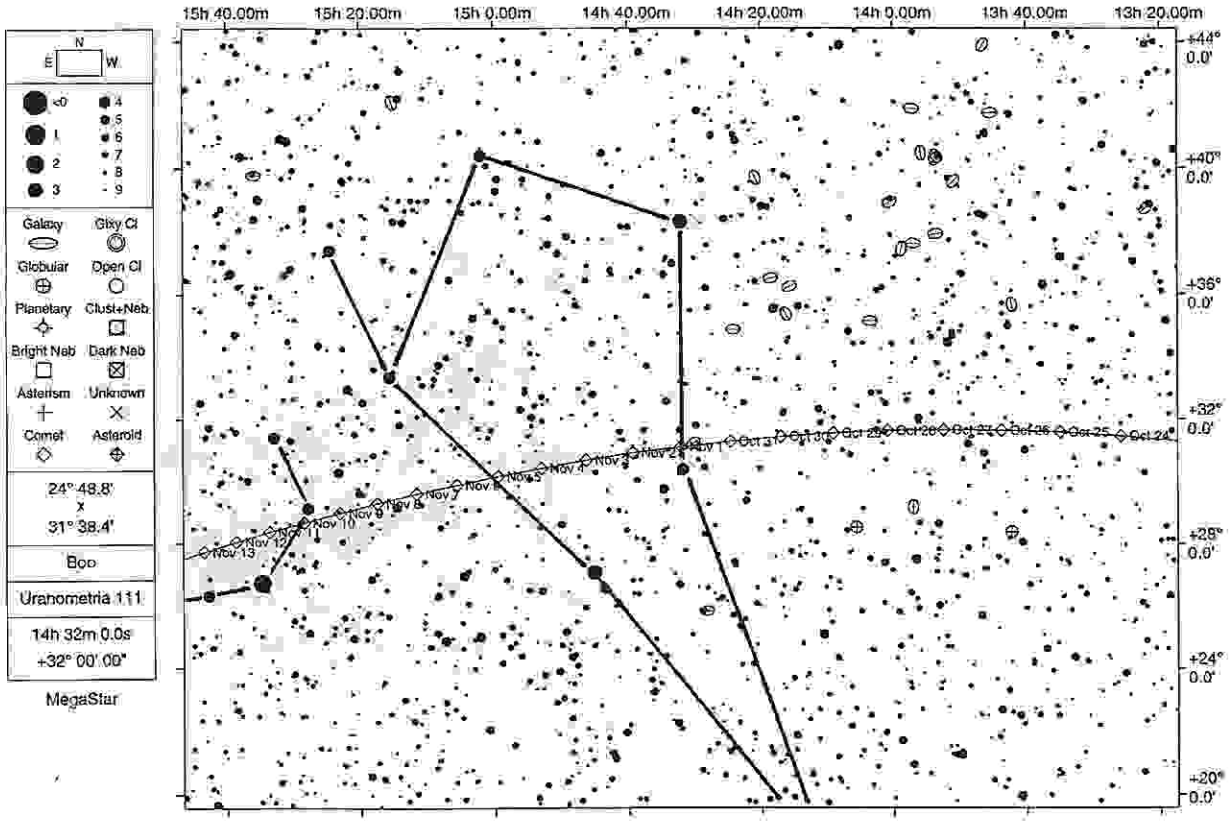
1995 NOVEMBER no twilight
no moonlight

We/Th	1/ 2	2:14am	5:18am
Th/Fr	2/ 3	3:13am	5:19am
Fr/Sa	3/ 4	4:12am	5:20am
Sa/Su	4/ 5	5:09am	5:21am
Su/Mo	5/ 6	-	-
Mo/Tu	6/ 7	-	-
Tu/We	7/ 8	-	-
We/Th	8/ 9	-	-
Th/Fr	9/10	6:51pm	7:31pm
Fr/Sa	10/11	6:51pm	8:19pm
Sa/Su	11/12	6:50pm	9:09pm
Su/Mo	12/13	6:50pm	10:00pm
Mo/Tu	13/14	6:49pm	10:53pm
Tu/We	14/15	6:49pm	11:47pm
We/Th	15/16	6:49pm	12:42am
Th/Fr	16/17	6:48pm	1:38am
Fr/Sa	17/18	6:48pm	2:37am
Sa/Su	18/19	6:47pm	3:37am
Su/Mo	19/20	6:47pm	4:41am
Mo/Tu	20/21	6:47pm	5:33am
Tu/We	21/22	6:47pm	5:33am
We/Th	22/23	6:46pm	5:34am
Th/Fr	23/24	6:46pm	5:35am
Fr/Sa	24/25	7:49pm	5:36am
Sa/Su	25/26	8:55pm	5:36am
Su/Mo	26/27	10:01pm	5:37am
Mo/Tu	27/28	11:06pm	5:38am
Tu/We	28/29	12:08am	5:39am
We/Th	29/30	1:08am	5:39am
Th/Fr	30/ 1	2:07am	5:40am

Erich Karkoschka

Comet DeVico Finder Chart

Star chart provided by Dean Ketelsen

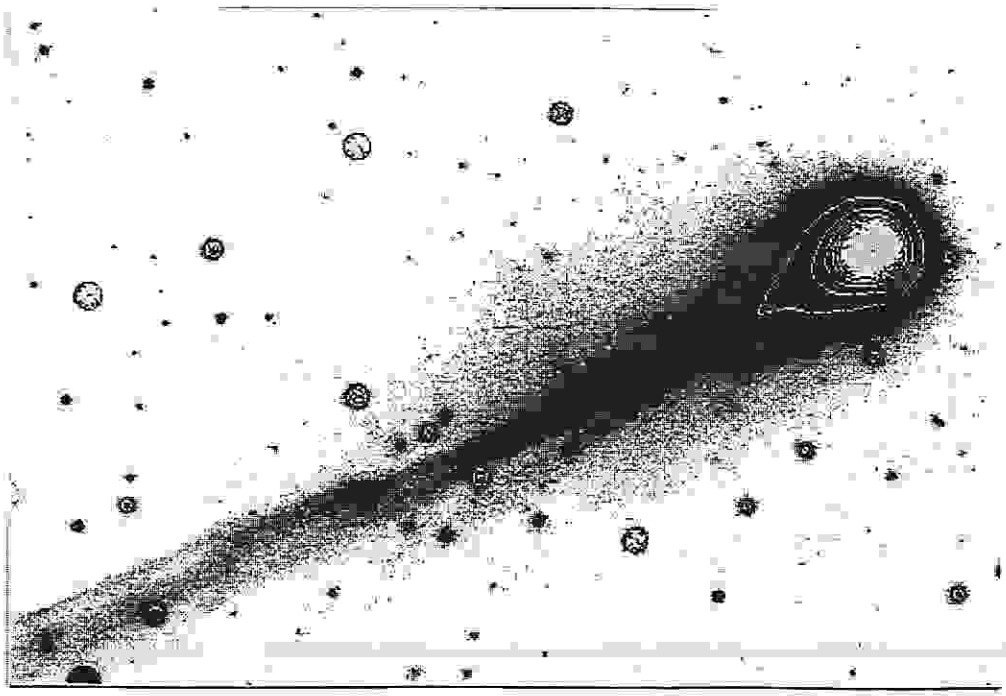


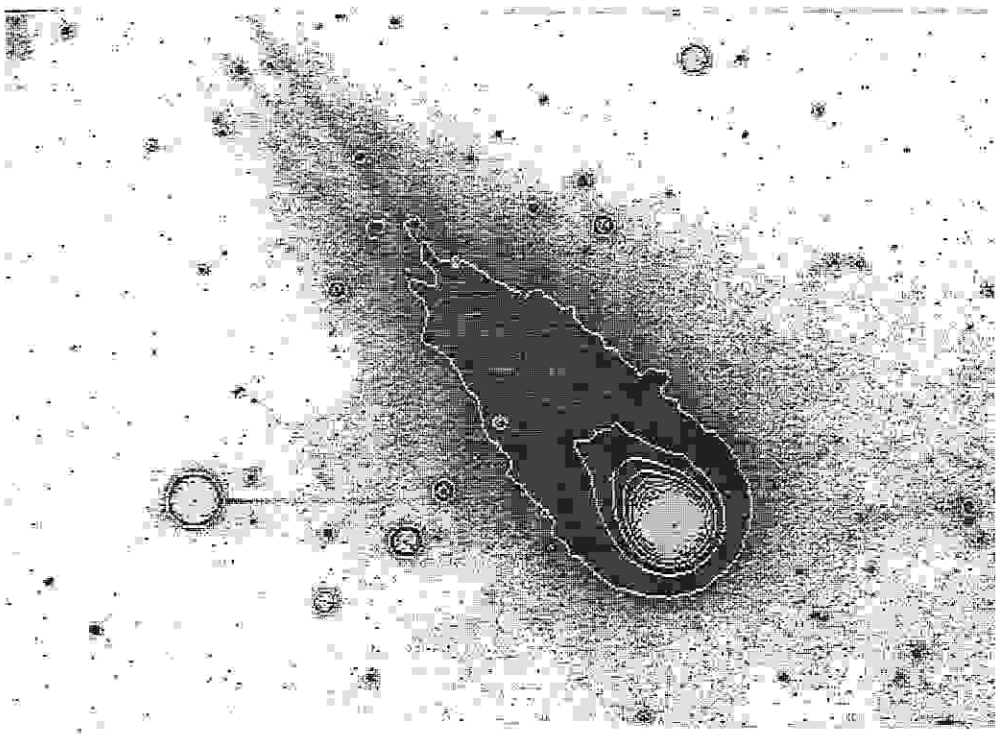
Comet De Vico in Bootes during November. Dates are for 12h UT (5am local).

Comet DeVico Photos

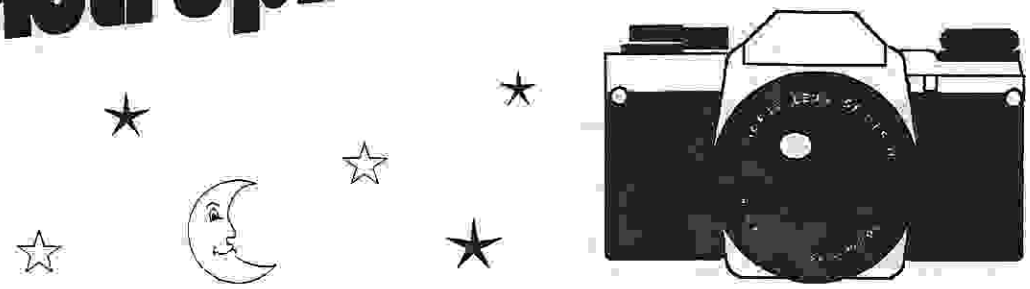
These photos were submitted by Ed Vega, who provided the following information:

"On September 30th, I made more images of the comet with the same CCD (as the cover) but through a different telescope, a 6" f8 refractor also made by Max Bray. These images show much more of the tail since the field is much wider. The comet presently shines at magnitutde 5.7 and will slowly fade to magnitude 9.6 by the end of November."





Astrophoto Exhibition



Got any great astrophotos? We're having an exhibition at the November meeting of astrophotos taken by TAAA members! There are 6 categories:

Lunar	Planetary
Cometary	Solar
Terrestrial/landscapes	Deep Sky

If there's an astronomical object in the photo (other than the Earth), it can be submitted. During the break we will be voting on the six best photos. These photos will be made available for purchase by friends, family and co-workers. Sales kits will be distributed at the December meeting.

Exhibition Rules:

- ⇒ *Submit prints in 5"X7" or 8"X10" format.*
- ⇒ *Only standard processing methods can be used.*
- ⇒ *Up to 5 submissions per photographer allowed.*
- ⇒ *CCD images must be submitted in photo format.*
- ⇒ *Must be free of copyright restrictions. Copyrights will be retained by the original owner. Photographer agrees to allow the Tucson Amateur Astronomy Association to use submitted photographs for fundraising purposes.*

Star Parties

Chiricahua Campout and Star Party November 18

For those of you new to the area, or who don't get out much, Chiricahua National Monument is a great getaway from the Tucson area. We have held fall star parties for most of the last seven years, because it is a great site for observing. We invite some of the local public and campers to join us for some public observing, and after they depart, we are left to observe in some of the darkest skies in the continent.

Massai Point, in the monument, is at 7000 feet altitude and its large parking lot is a great place from which to observe. We have traditionally had great observing conditions with the Gegenshein routinely visible and the seeing usually very good. We'll give it a good test with the sun's passing through Saturn's ring plane very near this weekend. Also, it is the peak of the Leonid meteor shower that day. It should be a wonderful time.

We have only held this event once in November and it was COLD! Particularly at 7,000 feet, expect freezing temperatures or lower. Don't forget it is better to bring too many warm clothes than not enough! Another uncomfortable feature here is that there is not camping allowed outside the official campground, so after your observing is finished, you are expected to move down to the campground about 4 miles downhill to retire and sleep.

We have the group campsite reserved for Saturday, but for those of you who have been there know, though the site sleeps upwards of 30, there is only space for 5 or 6 cars. We will have a signup sheet at the November meeting for those spaces. Usually a few members get individual campsites, and we can double up on parking at some of those sites. We have never had a problem with parking, even during well attended events.

Be sure to arrive early enough to take part in the mid afternoon cookout. Afterwards, it is time to head up the hill and set up for the early sunset and some bright objects for the public who shows up. The monument is very scenic, with lots of hiking trails - be sure to allocate some time for exploring either Saturday afternoon or Sunday morning. This is a very pleasant excursion from Tucson, so be sure to come out and join us!

Chiricahua National Monument is about 125 miles southeast of Tucson. Take I-10 east to Willcox, then follow the signs south about 40 miles to the Monument. Allow about 2.5 hours for the trip. *

Donaldson Elementary Star Party November 27

A star party is being planned for Donaldson Elementary School between 6:30 pm and 8:30 pm. For details see Terri Lappin at the next meeting. *

Star Party at San Carlos Indian Reservation High School, date/time TBA

Steward Observatory has asked us to participate in a star party which will be held at the high school on the San Carlos Indian Reservation. About 100 students are expected to attend, so Steward needs all the help they can get. The date hasn't been determined as of the printing of this newsletter, so an announcement will be made at the November meeting. I have suggested to the organizers that the star party be held on a Saturday to allow our members time to drive to the site. I have been told it is about a 2 hour drive from Tucson to the school, so plan on a pleasant afternoon drive. The event should be over by 9pm. I haven't asked about staying over to observe later, but if there is interest I can find out. This is a long distance, but since Steward provides our meeting place free of charge, it is the least we can do in return. Please consider attending this star party. Call Terri at 579-0185 if you miss the meeting announcement or have questions. *

Eclipse Cruise February 1998

I am just gathering some info on a cruise to the Feb. 28, 1998 total solar eclipse. We are looking at the possibility of either chartering our own ship, probably from Holland American Line, leaving San Juan Puerto Rico, with a stop at St. Thomas, plus another stop and then on to Aruba for the eclipse on that Thursday. This depends on the amount of hurricane damage to St. Thomas. and so all that can be said right now is that there will be two stops in route to Aruba.

Another possibility is to reserve a block of cabins and have a large quantity of fun astronomers show up to occupy them. That would more than likely be on Princess or Carnival Lines, since they already travel to Aruba, the island in the best position for the centerline of the eclipse.

In either scenario, a deposit of $500 will be needed to confirm and hold your space on the cruise. With the total amount due by Dec. 1, 1997. The complete cruise package will range from $1850 to $3500 per person, this includes air fare from you departure city to San Juan. The category and location of your cabin on the ship will determine the price.

So, our travel agent for this rendezvous with darkness at noon is Barbara Philips at Regency Travel in Scottsdale, Arizona. She is not an astronomer, but is learning by being around me for several hours. Barbara can certainly answer any questions you might have concerning the cruise ships or accommodations. You may reach her at 602-596-6787, or 1-800-796-8024 outside AZ.

I know this seems very distant, but putting a group of this size together requires advance planning. I have no doubt that a winter eclipse in the Caribbean will attract large numbers of observers, so get on the phone to Barbara if you are interested in sailing with us.

After being an active Arizona astronomer for the past 20 years, I know for a fact that there are lots of interesting, exciting, knowledgeable and fun-loving folks around here. That is really the motivating factor about trying to get this together, an opportunity to meet and spend some time with a fun bunch under the Moon's shadow!

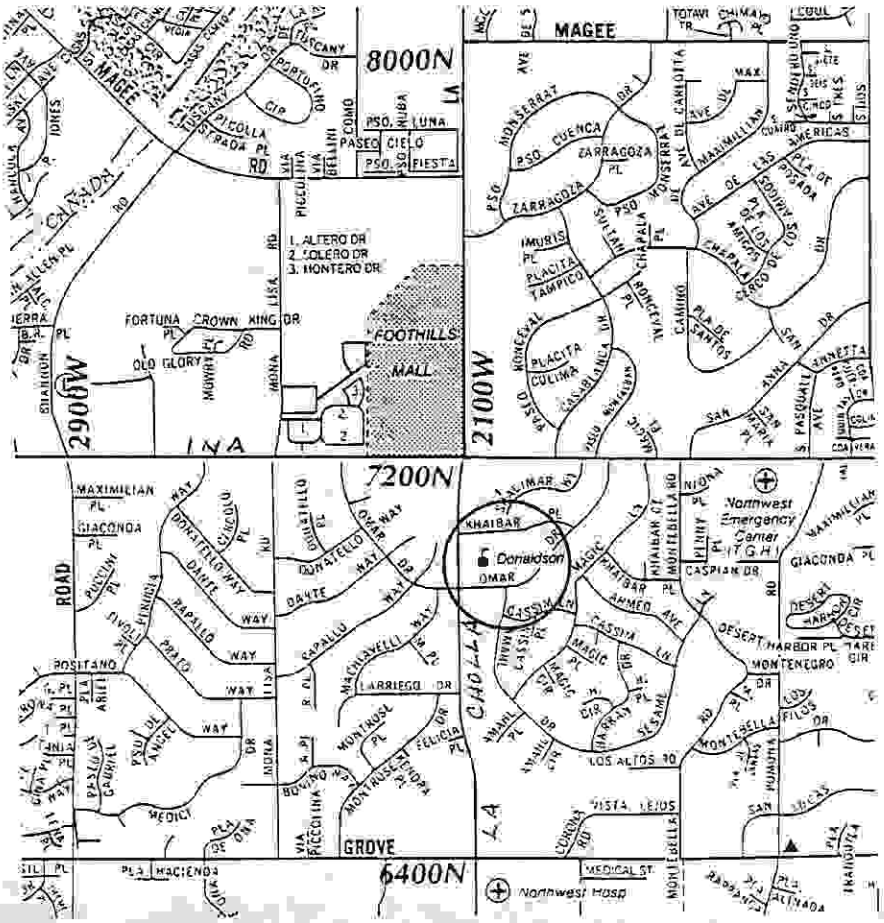
Starting on my tan NOW!

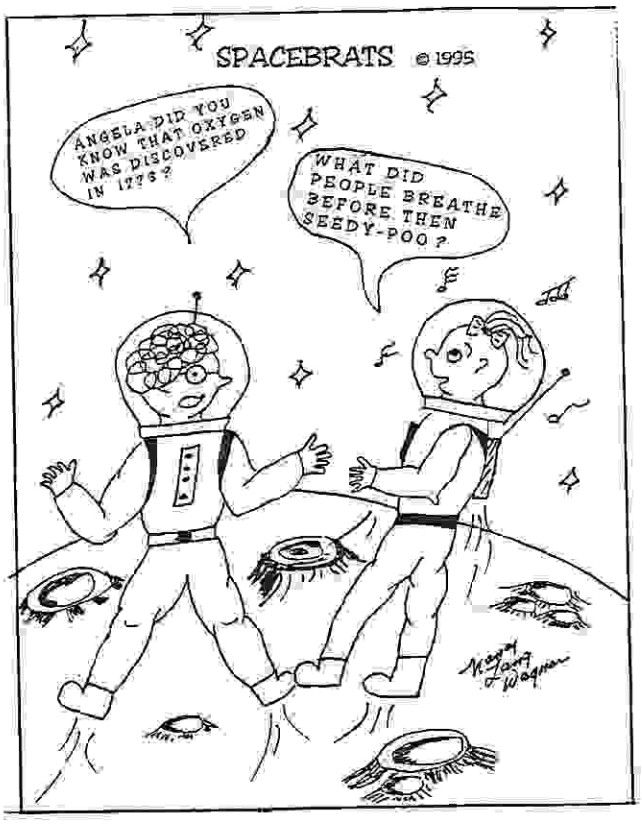
Steve Coe, Saguaro Astronomy Club

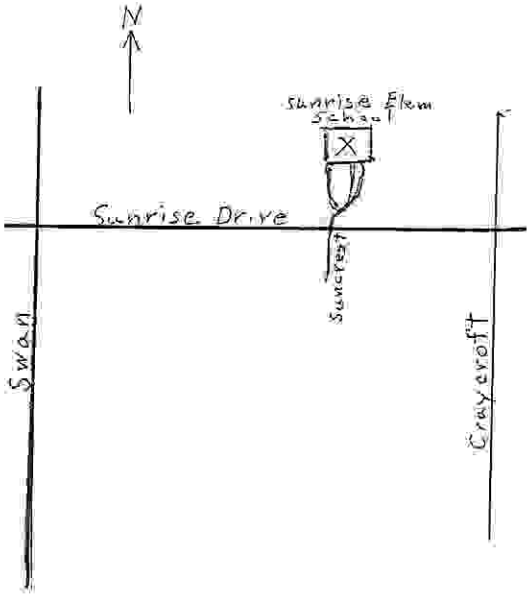
*

Star Party Maps

Donaldson Elementary School is located just south of the Foothills Mall off La Cholla. See map to the right -------->>>







Star Party at Sunrise Elementary School on November 6, from 6:00 - 9:00 pm, in the courtyard in front of the library.

THE EGG

It seems with the cooling Autumn temperatures at night that the colors of the stars are more striking. This is especially noticeable with the color contrast double star pairs. There is a fine example of this visible high overhead during these November evenings. Gamma Andromedae or Almach pronounced (al-MAK) is a splendid color contrast binary system having hues similar to Albireo in Cygnus. Almach marks the left foot of the chained maiden Andromeda, and it shines fairly brightly at magnitude 2.1.

In the late 1700's the German astronomer Johann Tobias Mayer discovered Almach was a double star with the primary having a golden hue and the companion appearing aqua. In a small amateur telescope Almach is the finest of the Autumn double stars visible. The primary γ Andromeda A is an orange giant star with a spectrum of K3 III. It's much larger than our Sun with a diameter about 25 times greater. It has a luminosity of about 90 suns. This star is in the expanding phase of its life so it has a cool temperature of 4,000° K. The companion γ Andromedae B is a main sequence A0p star, with a magnitude of 5.1. It's much hotter than the primary having a temperature of 11,000° K, and a luminosity of about 50 suns. The separation of this pair is 9.8" at a P.A. of 64°, and no change has occurred in the last 130 years.

In October 1842 Otto Wilhelm von Struve discovered γ Andromedae B to be a close binary with a period of 61 years. γ Andromedae C is also a main sequence star, spectrum A0 V, magnitude 6.3. It orbits γ Andromedae B at a maximum distance of 30 A.U.'s which is nearly equal to the diameter of our Solar System.

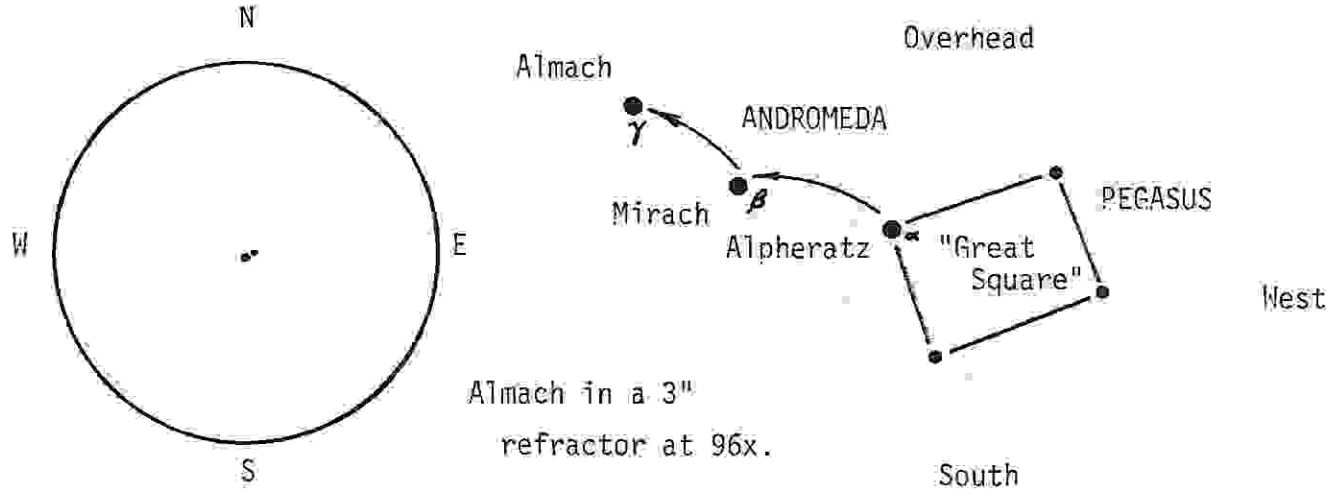
γ Andromedae B is again a double system with a star orbiting within a million miles of it's surface. This is a spectroscopic pair with an orbit of 2.7 days. This makes γ Andromedae a quadruple star system. The distance to Almach is 250 light years.

In a small amateur telescope you will want to use your medium magnifications to separate the wider pair. I like to use powers of 50x to 100x on my 3" refractor to get the needed resolution. The first telescope I owned was a 2.4" refractor which had only one eyepiece which gave 35x.In that telescope Almach wasn't resolved but appeared elongated like a cosmic egg. The view left a lasting impression on me. The closer binary pair of γ Andromedae BxC will require a large telescope, 12" aperture at least with very still skies, and high power (400x-500x). This pair is separated by 0.45" at P.A. 104°. So if you can get your hands on a large telescope, why not try and see if you can resolve Almach into a triple star.

To find Almach locate the "Great Square" of Pegasus, then find Alpheratz, that's the star at the northeastern corner of the square. This star marks the beginning of Andromeda, next hop 13° northeastward to Mirach (β Andromedae), then make another 11° hop in the same direction to Almach.

This month not only do we have the opportunity to see a double star with small telescopes, but those of you who can access large telescopes have the opportunity to see a ternary system of distant suns.

JEFF BRYDGES



Almach in a 3" refractor at 96x.

Chief Observer's Report

Comet DeVico (still a nice binocular object) is sinking fast and fading somewhat in our morning sky (only 7 degrees up by start of morning twilight on Nov. 1). The comet will switch to the evening sky this month however. By Nov 11, the comet is 12 degrees up at end of evening twilight in Corona Borealis, but that's as high as the comet gets in our evening sky this month. Because of this, my report this month centers on other sky events.

The planets Mars, Jupiter and Venus will gather in the western evening sky this month, each night moving closer and closer in our sky. By mid-month, the 15th, bright Jupiter will slide by ruddy Mars. Look for the "red planet" below bright Jupiter, in the western sky. Brilliant Venus, the third planet and brightest of the trio, will lie below Venus and Jupiter. Venus will move towards Jupiter and Mars each progressive night. By the 17th the three will fit in a circle on only 3 degrees in size (that's three finger's width, held at arm's length). After the 17th, Mars and Venus then approach each other; By the 22nd they lie only 12 arc minutes apart! After the 22nd, Venus will move away from Jupiter and Mars, as the latter two sink toward the horizon. Try observing this planetary "conjunction" each night with binoculars. If you are observing this planetary alignment with "non-astronomy" types or children, remember to remind them that this close planetary gathering is seen due to our line of sight here on Earth. In reality, the planets are many millions of miles apart.

Early in November, Saturn is high in the south in the evening sky, 2 hours after sunset. This is the month to see another rare "ring-crossing". With this month's ring-crossing, the rings are edge-on from the center of the sun (see Nov. Sky and Telescope, p. 65), and the sun "sets" as seen from the north face of the rings. Of course as seen from Earth, there is no glare from the rings (we'll see their shadow on Saturn's disk), so the faintest of Saturn's moons can be seen and/or discovered. The exact date and time of the ring plane crossing is Nov. 19 at 7AM Tucson time (MST), although for several days you'll want to watch carefully for sunlight seen dimly through gaps in the rings and for other rare effects (see also the May Sky and Telescope, pp. 68-71, and August pp. 72-77). In observing fine planetary details like this it can help to set your telescope up at a mountain observing site above 8000' to maximize your chances for good seeing.

In addition to the spectacular gathering of Venus, Mars and Jupiter on November 17, the height of the Leonid meteor shower will be occurring the night of Friday, November 17 into the morning of Saturday November 18. The most meteors will be seen 3-4 hours before sunrise on Saturday, so start observing no earlier than 2AM (see Sky and Telescope, Nov. 1995, p. 32-33). That morning a 21% lit waning crescent moon will lie below the constellation Leo (where the Leonids appear to emanate from, hence the name) but will not interfere significantly with meteor watching. Although typically a weak shower (usual meteor counts are around 10 per hour-zenithal hourly rate), the Leonids need careful monitoring as brief but spectacular activity has occurred in the past. The Leonids are of course most famous for giving incredible displays (meteor "storms") in 1833 and 1966, occurring with a period of 33 years. With this, and more detailed information (again, see Sky and Telescope, Nov. 1995, p. 31), predictions are for the next storm to occur any Nov. 17-18, from 1997 to 2000. However, there may be more than one stream of meteoroids from the parent comet (P/Tempel-Tuttle) that cause the shower. The possibility exists (although very small), that this year's Leonid meteor count could increase dramatically. One thing is for sure, the uncertainty involved in predicting the Leonids. I welcome information from any observations of this year's shower. Clear skies.

Michael Terenzoni
Voice mail at 621-2001: mailbox #111-1123
E-Mail: MikeT@ns.arizona.edu *

What's New at Flandrau

FLANDRAU
SCIENCE CENTER

FREE ADMISSION to Assoc. of Science & Technology Centers

ASTC, or the Association of Science and Technology Centers, is a collection of about 450 centers that present hands-on, interactive exhibitions for the general public, and all of them have their own approach and cover different aspects of science and technology. Many of them have planetariums and OMNIMAX or IMAX theaters. Your membership in Friends of Flandrau entitles you (in addition to free Flandrau show and building admissions for one year) to free admission to 152 of these that are part of what is called the reciprocal fee admission program. These include Reuben H. Fleet in San Diego; The Kitt Peak Museum; Arizona Museum of Science and Technology in Phoenix; Exploratorium in San Francisco (California has 11 centers in the program); Pacific Science Center in Seattle Washington; Oregon Museum of Science and Industry in Portland Oregon; Utah Museum of Natural History in Salt Lake City Utah; this reciprocal program even includes free admission to centers in other countries! If you want a full list, call Flandrau or come in and pick up a list.

The admissions vary, (not everything is free!), but can be as high as $5.00 but you will usually get some discount to theater events. Each center decides for itself what discounts to give. In any event, your membership card with the ASTC emblem on it will get you in to all of these places free. We recommend that everyone visit Fleet in San Diego, it is in Balboa Park, not far from the famous zoo. In any case, membership in Friends of Flandrau is a very good deal. To join Friends of Flandrau, call Flandrau Science Center at 621-4515 (9AM-5PM), weekdays.

Michael Terenzoni, Outreach Coordinator
Flandrau Phone: 621-4515/business hours
Voice mail at 621-2001: mailbox #111-1123
E-Mail: MikeT@ns.arizona.edu *

A Star Party for 50,000 People

BY DEAN KETELSEN

As noted in this and previous newsletters, John Dobson, of the San Francisco Sidewalk Astronomers is a well-known popularizer of astronomy. It was for his 80th birthday that the good folks there sent out word to celebrate with acts of public astronomy on the Labor Day Weekend. Well, you want to set up your scopes where the people are, and it happened that the Wildcats had their home opener just after sunset that Saturday, so I planned for some observing just outside the stadium.

Now most public events take some planning. This one, wheret hey have ROTC folk blocking most streets and parking lots within a mile of campus took even more. Fortunately for me, I work under the east stands of the stadium in the Mirror Lab, and earlier in the day I stopped to drop off my scope (yes sir, I'm only stopping by to get tickets). With the first quarter moon out, and the game starting near sunset, I'd limit observing to sunspots and the moon, so used only my 5" battleship binoculars.

With three hours to game time, I drove the motorcycle in to where I park for work. The streets were deserted, as they were all blocked off for "game traffic only". The ROTC guards were now replaced with more serious- looking adult security staff, but nearly everyone ignores vehicles with 2 wheels. I lugged out the binoculars and their heavy tripod and set it up literally 50 feet from the NE entrance. Immediately setting up with some Thousand Oaks full aperture filters, there were takers for views right away.

I always imagined that if doing something like this, I would need a permit or something, and that the security staff would give me a hard time. It turns out those fears were unfounded, and they stood in line with the rest of the crowd to take a look. The sun was sort of dull, with only one small spot, so we turned to the moon about 2 hours before game time. The moon always brought exclamations of joy, even at the low 20X magnification. The kids especially had a great time looking, comparing the sight to the "Apollo 13" movie they had recently seen.

Once on the moon, there was pretty much a constant line. It was amazing how many people I knew going to the game. Admittedly I had not seem many of them in years and they came up to me with the line "still doing the astronomy thing, eh Dean?" My motivation was a mystery to most as it was obvious I wasn't taking money (the first concern for most parents). I told a few about the public celebration of John's birthday, but I figured most wouldn't know him, so I just said that I did it because it was fun. One policeman summed it up in his mind correctly, "So you are doing this for the educational and entertainment value, right?" I couldn't have said it better myself.

Well, one TAAA member came by, Molly Hancock, and provided a welcome bathroom break, and she stuck around to talk to the folks as well. I figure that something like 400-500 got to look at the sun or moon, not bad for a couple hours. Would I do it again? You bet! And you know, since then, I have had my eye out for good spots for public astronomy. There are often scopes set up on Geology Vista on the way to Mt Lemmon, drawing nice lines on weekends. Another came to mind last weekend while dining with Roger Tanner at Pinnacle Peak Steakhouse - a teeming mass of 200 people with nothing to do while waiting for their tables and Saturn just looking down from above. Perhaps I'll be there to show you the ringed planet next time you eat there. Happy Birthday John! *

Sidewalk Astronomers Celebrate Dobson's 80th

BY BARRY HIRRELL

John Dobson is a hard man to shop for. What do you give a person who readily claims the best gift he ever got was a "mini-squeegee" he could use to clean the inside of his windshield, after the de-froster gave up the ghost? I mean, he still has the damn squeegee; so what to do?

We decided the best gift for John would be a gift to the public. A weekend of star parties and astronomy for the masses! Sidewalk astronomers from all over descended on San Francisco, a city already known for having those little cable cars going half way to the stars. With a little luck on the weather forecast for Labor Day weekend we could surely bridge the rest of that distance.

Astronomy clubs world wide were urged to follow our lead; the S.F. amateurs set up camp at Glacier Point in Yosemite. There, across the valey from Half Dome, they turned telescopes skyward for the large crowds enjoying the last big summer weekend. Many other clubs, including TAAA, held their own public events in unison with our festivities. In the City, we rallied our troups at the corner of Jackson and Broderick. This is the legendary spot where the Sidewalk Astronomers were born many moons ago. Stunned pedestrians gathered to watch us unload our armada of "light cannons" and take aim on Jupiter, Saturn, and a first quarter moon. A bus driver who stopped for a look was so taken with it all that he repeatedly ferried up busloads of new faces to the telescopes. Dobson held court throughout, giving an impromptu lecture from the curbside.

The following day, focus shifted to the Randall Museum for an all day public astronomy program. A 10" "Dob" was ground, polished, and asssembled by our volunteer staff of champion scope builders, and we also had moon rocks, light and color boxes and a portable planetarium. Kids were busy grinding their own mirror and making space shuttle models and solar system artwork. As soon as the morning fog lifted we began solar viewing, as hundreds of curious onlookers poured through; soaking in astronomy info like sponges. We toasted John with a ceremony in the auditorium later; where we bestowed him with a proclaimation from our mayor and letters from Al Gore and Senator Feinstein. We watched old home movies shot 25 years ago; showing a shirtless, pony-tailed dobson making scopes and hiking around Mt. Tamalpais looking like a Soloflex ad. We topped it all off with cake and a star party for all. It was a great weekend; and I think he liked it almost as much as the squeegee! *

TAAA Executive Committee Meeting - October 10, 1995

Members present: John Kalas, Dean Ketelsen, Terri Lappin, John Mulder, Gary Rosenbaum, Larry Wilson.

Meeting called to order at 7:45pm.

1. New Business: Part of the TAAA library has been moved to our cabinets in room 208 of the Steward Building (the computer room). Many books are outdated and we may have to cull the herd a bit. Terri is working to produce a new info brochure for the club, and the problem of a club phone number again came up. Dean naively volunteered to let us continue to use his number, but it is clear that we need to make other arrangements.

2. Events/Meetings: Personal business has prevented the Chairmen of the Education Committee and the Young Astronomer's Club from holding meetings recently. Terri will be contacting them and discussing alternate arrangements. Two new star parties are scheduled for 26 October (6:30pm) in Oracle, 27 November (6:30-8:30pm) Donaldson School.

3. Treasurer's Report: We have 250 members (11 new, 14 renewed, and 17 dropped). Current Financial Status as of 30 September, 1995 Profit/Loss:

Total Income	1612.18
Total Expenses	1025.52
Net Income	586.66

Balance Sheet:

Total Current Assets	34,230.66
Total Fixed Assets	34,234.00
Total Assets	68,464.66
Total Liabilities	-250.00
Total Equity	68,214.66

4. Fundraising Report: John Kalas' proposal to sell 8x10 copies of members selected astrophotos was discussed, including obtaining pictures, producing sales kits, and motivating sales. Some kind of competition to judge and select the best entries is envisioned, but no details decided.

5.Old Business: The board received the bill for club membership in the Astronomical League 2+ months late, forcing an immediate decision on payment. In view of the turmoil caused by the last bill, a motion was made to pay this years AL bill with the understanding that as soon as possible the board will work out some method to make AL membership optional. The motion passed unanimously. The speaker for November's Beginners Lecture was forced to cancel. No replacement has been scheduled at this time.

Meeting was adjourned at 9:15pm.

Desert Skies Classified

FOR SALE: Achromatic Barlow Lens by Edmund Scientific, 2x and 3x amplification. Negative focus lens. 47 mm $20.00 Call Gilbert Friedman 571-1662. (11-95)

FOR SALE: Six inch f/10 Alt/AZ homemade Newtonian telescope with newly re-aluminized mirror by legendary optician Joe Frish - $300. Call Dick Buchroeder at 884-9800. (12-95).

FOR SALE: In excellent Codntion - LX200, 10-inch f/10 telescope, 1 yr old, with carrying case, several 1¼ inch eyepieces and a field tripod. $2,000. Call Shamus Carney (909) 657-8857. Will deliver for a nominal fee.(12-95).

FOR SALE: Brandon 80mm f/6.25 APO refractor, 2" focuser, 2" diag., 2" 32mm eyepiece in wooden case $250. Meade 60mm f/11 guidescope fitted with 1¼" sky micro regular focuser $90. Lumicon DS filter 1¼", $25. O.B.O. Commadore 64 keyboard and disk drive plus extras, V.G. condition $80. O.B.O. Call evenings 797-1693 - ask for Ted. (12-95).

FOR SALE: Meade 10" f 6.3 Premiere with DRS and SBIG (Santa Barbara Instrument Group) set for ST4 or ST5. Three eyepieces, T.O. solar filter, Wedge tripod, 5" diameter steele pier $1,600 or best offer. ALSO: 8' X 8' aluminum observatory building $400 with roll-off roof. Call Bob Lindsey at 749-0864. (01-96)

FOR SALE: Set of optics for 8" Dall-Kirkham Cassegrain telescope made by Coulter Optical Co. Focal length of primary is 31 ½ inches, amplification factor 4. Primary and secondary are not aluminized. $200. Can make tube assembly and mounting if you desire. Call Duane Niehaus at 797-4189. (02-96)

FOR SALE: Bell and Howell wide field camera lens for large format photography. 12-inch focal length, 5 inch clear aperture. Includes light yellow clip-on filter. $100. Call Duane Niehaus at 797-4189. (02-96)

FOR SALE: Lens blanks, 8 ½ inch dia. for 8 ¼ inch clear aperture refractor objective lens. Glass by Schott; BK7 crown and F2 flint each 1 inch thick. $350 for the set. Call Duane Niehaus at 797-4189. (02-96)

FOR SALE: Generated lenses for 8 ⅛ refractor objective. R_1 = 83 inches; $R_2 = R_3$= 35 inches; R_4 is flat now but can be ground to proper curve to give focal ratio of f15 to f18. Not certain about crown and flint, but probably BK7 and F4. $200 for the set. Call Duane Niehaus at 797-4189. (02-96)

FOR SALE: In excellent condition-Meade Variable-Projection Camera Adapter (1.25"). T-ring not included. Purchased Spring '95, however, it's only been used twice. $30. Call Detrick Branston at 318-8334. (02-96)

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 Nancy or Nina at 579-1382 or email to 74750.247@compuserve.com.