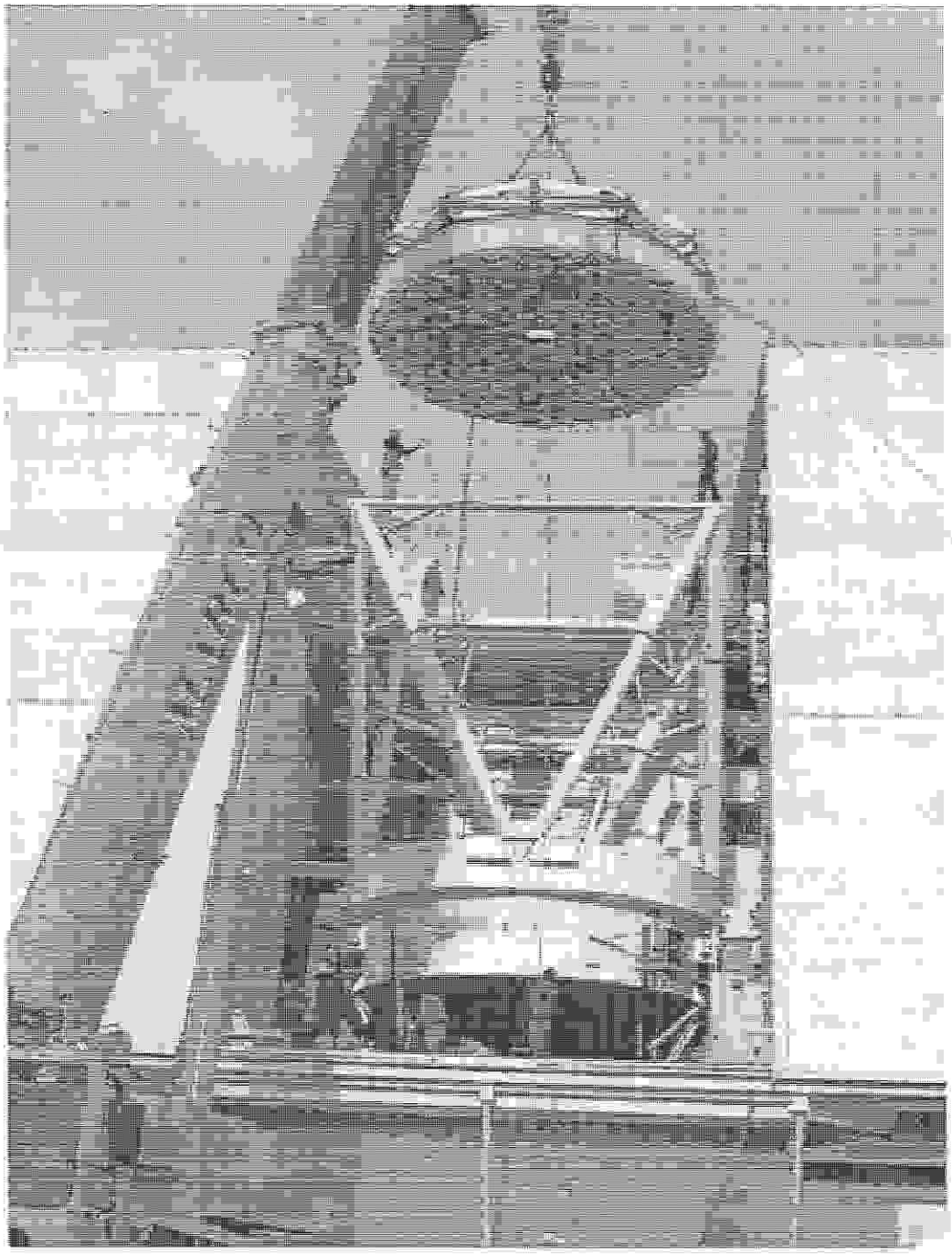
Desert Skies

Tucson Amateur Astronomy Association

Volume XLVI, Number 5 May, 2000



MULTIPLE MIRROR TELESCOPE CONVERSION

Calendar of Events

BEGINNERS LECTURE: Friday, June 2, 6:30 pm at the Steward Observatory Auditorium - Room N210. This month's topic is ***Spiffying Up The Old C-8*** by John Kalas.

GENERAL MEETING: Friday, June 2, 7:30 pm at the Steward Observatory Auditorium - Room N210. Topic ***Multiple Mirror Telescope Update*** by Dr. Craig Foltz.

BOARD OF DIRECTORS MEETING: Thursday, June 8, 7:00 pm at Steward Observatory Conference room N305.

STAR PARTIES & EVENTS:

- May 6 - Desert Museum Public Star Party
- May 8 - Catalina Foothills High School Star Party
- May 10 - Roadrunner Elementary School Star Party
- May 11 - Esperero Canyon Middle School Star Party
- May 12 - Valencia Middle School Star Party
- May 16 - U of A Universities Conference Star Party [Paid]
- May 26 - Sahuaro Girl Scouts Council Star Party
- May 27 - Smithsonian Study Group Star Party
- May 27 - TAAA Empire Ranch Star Party

Newsletter Schedule: Deadline for articles: Monday, May 15. Printing: Tuesday, May 23. Folding Party: Wednesday, May 24. Mailing: Thursday, May 25. The newsletter is scheduled to be in the mail at least one week prior to the following month's General Meeting.

Cover: Installation of $10 Million, 10 ton primary mirror into the MMT on March 25, 1999. Photo: downloaded from MMT website <http://sculptor.as.arizona.edu/foltz/www/mmt.html>.

TAAA Web Page: http://www.tucsonastronomy.org **TAAA Phone Number: (520) 882-1950**

Office/Position	Name	Phone	E-mail Address
President	John Kalas	620-6502	jckalas@aol.com
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Newsletter Editor	George Barber	822-2392	barbergj@flash.net
Star Party Coordinators	Maggie & Jeff Buzek	760-4578	jeffbuzek@aol.com

TAAA Mission Statement:

We are a resource for anyone interested in astronomy. It is our mission to nurture a person=s natural curiosity about the night sky. By giving people a knowledge and understanding of astronomy, we enhance their enjoyment of the solar system and beyond. Through our public activities and school evening observing sessions, we bring astronomy to persons of all ages. Our regular meetings and observing sessions offer members a forum to meet others with similar interests and experiences and to learn from one another.

Annual Membership in the TAAA:

Regular membership	$ 23
Senior membership (over 60)	$ 21
Student membership	$ 15
Add for Family membership	$ 5
Add for Astronomical League (optional)	$ 8
Add for contribution to Southern Arizona Section of I.D.A. (optional)	$ 3 (recommended minimum)
Add for Sky & Telescope Magazine Subscription	$ 29.95
Add for Astronomy Magazine Subscription	$ 29

Rates for membership are given above. Family Membership includes two adults plus minor children. Members may subscribe to Sky & Telescope or Astronomy magazine (or both) at the time of membership renewal, saving substantially over the regular subscription rates. To assure we understand what you are paying for, please identify which class of membership and what options you want. Send one check made payable to *TAAA* to cover membership dues, magazine subscription(s) and any contributions to:

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

Four 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. Find your membership class and its rate. Add the Family Membership rate to this, if applicable.
3. If you desire membership in the Astronomical League or magazine subscription (s) or wish to make a donation, add the appropriate amounts to your membership rate. If a magazine subscription renewal is desired, include the magazine renewal notice, if possible. Be sure to identify which options you are paying for.
4. Write one check, payable to *TAAA*, and send it to the address given above.

- Call the Treasurer if you have any problems.
- Send address changes to the above address.

Desert Skies Publishing Guidelines:

All articles, announcements, news, etc. must be submitted by the newsletter deadline noted 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 in Word compatible files via e-mail or on a floppy disk. 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 or e-mail: jckalas@aol.com
c/o John Kalas
3470 W. Red Bird Court
Tucson, AZ 85745

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President's Message

As I think back on my last two years as President, I appreciate the support of the members of this fine organization. The club's achievements would not have been possible without the efforts of so many people. A perfect example of this volunteering spirit was evident at the Telescopes For Telethon activity at Sabino Canyon on April 8th. Despite absolutely horrible weather conditions of solid clouds and wind, most of the people who volunteered to participate in the event showed up. When given the option of leaving, none of the volunteers left. Instead, they set up their telescopes and prepared for the possibility of a meager public turnout. The weather never cleared up but everyone stayed and offered those who did come to the event a hazy view of the Moon. All of the T4T Committee should be commended for their efforts. Everything was in place for a highly successful activity - except the weather. Special thanks to Laurel Dunlap, T4T Committee Chairperson, for the endless hours that she devoted to this event. Even though the public turnout was well below expectations, donations were well above last year's total. Thanks to all who participated.

We have another chance to support a major public star party this month at the Desert Museum on Saturday, May 6th. It should be a fun evening, so mark your calendar! See the announcement in the **Star Parties and Events** section of this newsletter.

This month's newsletter is the first edition composed by our new Newsletter Editor, George Barber. I am very pleased that George has volunteered to support the club in this very important capacity. George is far more computer savvy than I am. He will simplify the job of composing our newsletter as well as develop improvements for its look and content.

John Kalas

Meeting Information

Beginners Lecture
"Spiffying Up the Old C-8"
by John Kalas

John will show how he took a basic telescope and, through the additions of some equipment and features, improved the performance and ease-of-use of the instrument. These simple improvements can be adapted to a variety of different types of telescopes. Maybe one or more of these ideas can be used to improve your scope.

Main Lecture
"MMT Update"
by Dr. Craig Foltz

Dr Foltz will bring us up-to-date on the commissioning of the new 6.5-meter mirror being installed into the original Multiple Mirror Telescope on Mount Hopkins, south of Green Valley.

Craig Foltz grew up in New Jersey, where he rarely saw a dark night sky. He attended Dartmouth College where he earned a degree in Physics in 1974. The dazzling New Hampshire night sky was influential in turning his interest to Astrophysics. He continued his studies at Ohio State, graduating with a Ph.D. in 1979. He joined the staff at the University of Arizona's Steward Observatory in 1981. After a brief sojourn at the University of Illinois, he joined the staff of the MMT Observatory in 1984 and has served as the Director there since 1996.

His research interests include studies of quasars and active galaxies, the nature of the intergalactic medium and degenerate stars.

Club News

Election of Officers

At the May monthly meeting, the TAAA will elect the officers for the upcoming year that starts in June. There was some confusion surrounding the nomination for the office of Secretary at the April meeting. John Kalas takes full responsibility and apologizes for the confusion. TAAA Member Jane Tongate announced to the people present at the newsletter folding party on 3/29 that she would be interested in considering the position of secretary. John Kalas failed to advise the Nominating Committee of this information. Laurel Dunlap contacted the Nominating Committee just before the April 7th monthly meeting and offered to be secretary if there was no other nominee. Andrew Cooper, Nominating Committee person, announced Laurel's nomination at the April meeting. Laurel and Jane were advised of the situation. After reconsidering her very busy schedule (Laurel is the TAAA ALCor and National Chairperson for the MDA Telescopes For Telethon Project), Laurel has withdrawn her name for nomination. Jane has agreed to remain as a nominee. The club appreciates Laurel's and Jane's offer to support the organization by serving as an officer. The slate of candidates for the May 5th elections is:

President	John Kalas
Vice President	Andrew Cooper
Secretary	Jane Tongate
Treasurer	Teresa Lappin
Members-at-Large	Bill Lofquist
	Robert Callanan
	Steve Peterson

Additional nominations will be solicited from the floor at the May 5th meeting.

Club News (cont.)

Grand Canyon Star Party
3-10 June, 2000

Well, it has been awfully quiet out there - have not heard much lately from any folks making plans so assume we will have some scopes there besides our regulars in the campground. Please let me know or remind me of your interest in giving a twilight talk. If any of you past attendees have any suggestions to make it a better event, also let me know. See you there! Dean 293-2855

TAAA Annual Picnic
Saturday, June 24, 2000

Mark your calendars! Ed and Pat Vega have again graciously invited the TAAA to have the annual picnic at the Vega-Bray Observatory in Benson. If you have not attended this event in the past, you won't want to miss this one! It is a fantastic, fun outing. There will be a potluck barbecue in the afternoon and tours of the fabulous Skywatcher's Inn. Telescope viewing will take place in the evening. Dr. Vega opens his observatory facilities to the attendees for some terrific celestial views. It is a great family outing. Details will be published in the June newsletter.

Help Wanted
Astrophotography SIG Coordinator

Astrophotography is one of the most popular activities of amateur astronomers. Once you've seen an impressive object in a telescope, capturing the view on film or disk is a natural desire. The TAAA is fortunate to have many accomplished astrophotographers as members. Would one of you be willing to share that expertise with members who are yearning to try their hand at this fascinating activity? If so, please contact John Kalas at 620-6502.

Help Wanted: TAAA Historian

The club has a long and important history but little of it is available except in memories. The function of this position would be to pull together as many of the old club newsletters that we can find to try to develop as much information about the association as possible. Once the documents have been located, the sky's the limit as to how we use the information. If anyone would be interested in taking on this project, please let John Kalas know (620-6502).

Electronic Newsletter

At the April 13th TAAA Board of Directors meeting, a discussion took place about the possibility of distributing the club newsletter via the Internet. The costs associated with the copying and postage for the newsletter are significant. If pursued, the electronic newsletter would be offered to members who volunteer to accept their newsletter electronically. The number of newsletters distributed electronically may also be restricted. The investigation is in a very preliminary stage and will require several more months of evaluation.

Member News

We welcome the most recent members who have joined the TAAA: Maureen E Aites, Joseph S Kulina, Mrs. Marian Marion, Donald T Morrison, Gary Pakalski, Jerry Scott, Walter and Dorothy See, Kenneth Siarkiewicz, Thomas Tambornino, Dean Taylor, and William C Till. We also welcome back our previous newsletter editors from a few years back: Nina Lehman and Nancy Wagner. Glad to have you join! If you haven't already, be sure to pick up a new member's pack at a meeting. Hope you'll make it to a star party or a meeting so we can get to know you.

Telescopes For Telethon 2000
By Laurel Dunlap

We were hit hard with dust, and clouds, and wind, but many came out in spite of the weather. Occasionally, we had a break in the clouds, displaying some eremitic lunar views through the rapidly escaping clouds. TAL/TAAA members persevered in spite of the weather. Some people came anyway, just because they had heard about the event ...and we were successful. We collected nearly $700 at the Sabino Canyon event, and the Tucson total contribution is nearly $1500. Toward the end of the evening, we were treated to an unexpected fireworks display from Ventana Canyon, better than most seen on the 4th of July. For some, the evening provided a nice setting to get together with club members and share a few stories, or a few laughs, over coffee. I would like to thank all of those hearty individuals who stuck it out to the last, and volunteered to support the event. If I have inadvertently omitted anyone from this list, please accept my apology. John and Liz Kalas, David and Wendee Levy, Sharon and Steve Koerber, Jeff and Maggie Buzek, Michael Magee, Andy and Deb Cooper, Steve Peterson, Laurel Dunlap, Matt and Mike, Tim Hunter, Bob Crawford, Frank Lopez, Randy Quiroz, Glen Nishimoto, Dean Koenig, Steve Koenig, Ingrid Saber, Karen Vanlandingham, George Barber, Jim and Joyce Charboneau, Mark Chambers, John Sosville, and Kevin Bays.

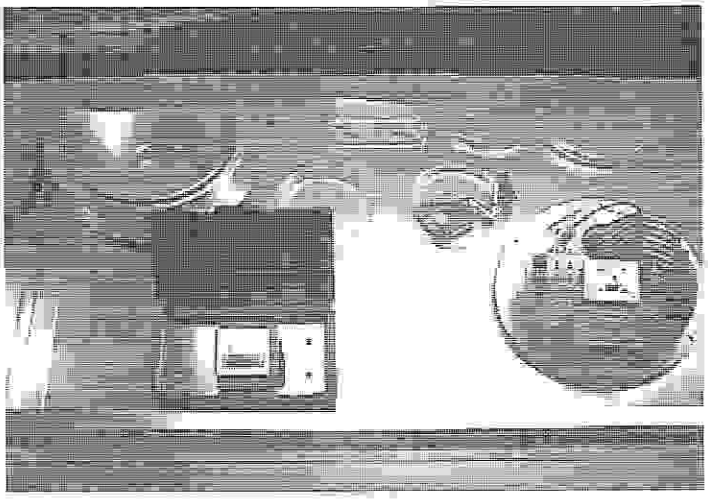
Computers and Electronics in Astronomy Subgroup Meeting Report
By Roger Tanner

The subgroup met at Roy Tuckers Goodricke-Pigott Observatory in his back yard southwest of Tucson on Saturday, April the 15. We had a large crowd, probably 15 people in all. Roy is interested in searching for Near Earth Asteroids, (NEO's). This is a difficult problem as they move across the sky at about an arc second or 2 per minute. Exposures longer than a few minutes will not increase your detection limit, as the light will have moved to a new pixel. A highly sensitive CCD camera is very helpful. Setting the focal length to get an angular pixel size of about 2 - 3 arc seconds is best. Then all the light from an asteroid will fall on 1 pixel during an exposure, maximizing sensitivity. The typical NEO Roy is hunting for is about 17th magnitude or fainter. The larger the field of view of the camera, the higher chance you have of finding an asteroid. Roy has found 3 NEO so far and has won the Benson prize for it.

Club News (cont.)

He has also found 2 Aten asteroids, an Apollo asteroid, a comet, and 3 Mars crossing asteroids as well. You can read all the details at his web site at: http://www.azstarnet.com/~gpobs/gpobs.htm#Observatory History

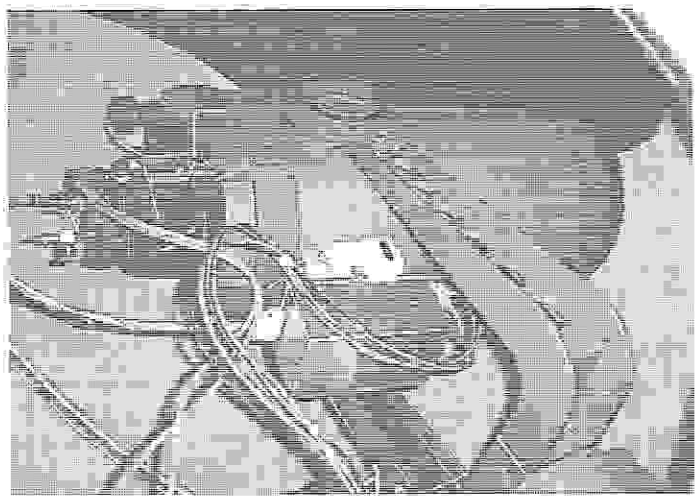
To achieve this Roy has designed and built a CCD camera using nearly the largest and most sensitive chips available. Roy showed us how he assemblies his cameras using a home made clean box to keep dust out of the inner



parts during assembly. All the design information is available on his web site for his camera business: http://www.teleport.com/~swcryo/

His cameras are using a Site 1024 x 1024 pixel back illuminated chip with 24-micron pixels; this chip is an inch on each side. This is huge compared to the typical amateur chip, which is more like ¼ inch on a side. The back illumination design gives the camera the ability to detect over 85% of the photons that hit the chip. The camera is vacuum insulated and has a multi stage thermal electric cooler pulling heat out of the CCD and dumping it into a bucket of water. The cooler keeps the chip at 211 Kelvin or about -62 degrees Celsius; this is 15-20 degrees colder than a typical amateur CCD. This reduces the dark current to a negligible level. Roy runs the cameras in strip scan mode.

The camera is hooked to a C14, which is housed in a sturdy 6-foot dome. Because of the long focal length, Roy bins his images, i.e., combines 4 adjacent pixels into one for readout. He points the scope to the section of sky he wants to search. He then turns off the drive on the scope. The camera moves the image across the chip at the same rate the sky drifts across. This keeps the charge accumulating from a given star marching along with the image of the star. The image is continuously read out; he gets a 512 pixel wide image that is as long as he wants. The exposure is set by the time it takes a star to drift across the chip. For the C14, this is about 87 seconds at 0 declination, which gets him to magnitude 19.7 stars in a 23 arc minute wide strip! Roy scans the same section of sky 3 times. He blinks the images to compare them and look for moving "stars". These are asteroids. Roy showed us the finder images for his first NEO. It was difficult to find it especially since there were many cosmic ray hits on each image. One by-product of the large sensitive CCD is detection of cosmic rays. With its size, about 100 appear on each image. Roy leaves the camera permanently mounted on the scope. He has a dial indicator set through one of the shipping bolt holes to read the mirror position. Then he just dials the required position for each temperature. He has the camera hooked to a bank of computers in the back room of his house. These computers run the camera, process the images, run sky chart programs, and, allow



him to contact anyone if he finds something. On a good night he can search 5-6 square degrees of sky.

As if this wasn't enough, Roy is building a new scope called the '3 shooter'. This scope will be housed in a roll off roof observatory next to the dome. The scope will have 3 - 14" F5 Newtonians on a common mount. Each one will have a 1024 chip camera. They will be aimed at the same declination but differing in Right Ascension by about 20 minutes. This way he will be doing his 3 scans simultaneously. Since he won't be tracking the sky, the mount will be a simplified English yoke. The shorter focal length means he won't be binning his images and will double his field of view. The stars will also take twice as long to drift across the chip, adding another .8 magnitude. This will allow him to cover a much larger area of the sky and go fainter as well. The data output each night would be 1.2 gigabytes, which is too much to look at and search manually for asteroids. Roy is going to use a program that searches images, identifies the stars in them, and makes up a list of objects for each image. Then he will write a program to compare the lists and look for moving objects, particularly objects with unusual motions. NEO's typically have a higher rate of motion than main belt asteroids. Then he will inspect the images to see if they are real and just main belt asteroids hits. This is a project at the professional level and I am sure the guys at Spacewatch, Catalina sky survey, and Linear are looking over their shoulders and wondering how an amateur can accomplish so much. A really good meeting and we wish to thank Roy for his hospitality, (and the food and drink). He was extremely patient with all of us asking questions non-stop for several hours.

Items of Interest (cont.)

Astronomer volunteers and teachers needed for Project ASTRO - Year Five!

The NOAO Educational Outreach Office is now accepting applications from TEACHERS and ASTRONOMERS (professional, amateur, and students) who wish to take part in Project ASTRO's fifth year in Tucson. This program forms partnerships between scientists and teachers and provides training, materials, and support for participants. Partnerships will take place next academic year (2000/2001) and the training workshop is scheduled for October 13-14, 2000.

Applications will be accepted through August 30. Consider applying as an astronomer partner (a degree in astronomy is NOT required) and get involved in this worthwhile teacher enhancement program. For more information about Project ASTRO visit this web page: (http://www.noao.edu/outreach/astro/) or contact Ginny Beal, gbeal@noao.edu, or 318-8535.

Mirror Lab Casting
19 May, 2000

The latest schedule has the Mirror Lab casting the Large Binocular Telescope's #2 primary on 19 May. The open house at the Lab will be through the afternoon until 7pm. TAAA members are welcome to stop by if you let them know in advance you are coming. Please call or e-mail Dean Ketelsen at 621-8764 (leave voice mail) or ketelsen@as.arizona.edu and tell him your name, affiliation (Tucson Amateur Astronomy Association) and the number of people in your group. Check at the May meeting for the latest information, and let Dean know by 17 May that you are coming.

MMT Rededication and Star Party
June 3, 2000

Join with the people of the Santa Cruz Valley in celebrating the re-dedication of the MMT telescope. We will have programs at the Visitors Center throughout the day, and a Star Party that evening.
To reach the Visitors Center, take the Canoa (#56) or Amado (#48) exit from Interstate 19. Follow the signs on the east side frontage road to Whipple Observatory.

S.A.R.S.E.F. (Southern Arizona Regional Science/ Engineering Fair

This year's fair was held March 14th at the Tucson Convention Center. The students submitted projects encompassing many disciplines. Judges representing the TAAA were John Polacheck and Ingrid Saber. Assisting were Erin Ryan, a second-year U of A science major, and Ken Morse, who has been helpful to the club in the past.

Based on their qualities reflecting research, scientific thought, organization, creativity, thoroughness, and skill, three astronomy projects were selected for awards.

In the Elementary school category, first-grader Elias Mechaber received a $60 gift certificate from Starizona from the TAAA for "Eclipse". Using two model train cars - one carrying a replica of the sun, the other of the moon - he demonstrated the eclipsing process.

The middle school award went to TAAA member Rhiannon Scott. She and her family received a night at the Skywatcher's Inn and Vega-Bray Observatory for "Sunspots". Using a solar filter and projecting the image onto paper, she monitored the movement of sunspots to calculate the rotational rate of the sun.

The high school award was shared by ninth graders Carrie Bleging and Daniel Murphy who worked together on "Astrochemistry: The Origin of Elements". Using a sub millimeter telescope, they viewed isotopes of silicon. These winners will share a $100 cash prize from Starizona.

The TAAA thanks these budding astronomers for their industry, and wishes them life-long pleasure probing the night sky.

Note: Upon receipt, Starizona will donate the TAAA awards back to the club.

TAAA ANNUAL PICNIC

Saturday, June 24, 2000

Vega-Bray Observatory

Mark Your Calendars!

Dark Skies for May 2000

DARK SKIES (no twilight, no moonlight) for Tucson in 24-hour MST: 18=6pm, 20=8pm, 22=10pm, 0=12am
RISE, SET, VISIBILITY for sun and bright planets: rise for morning object, set for evening object

Su/Mo	30/ 1	20:34 - 4:08	Th/Fr	11/12	2:26 - 3:55	Su/Mo	21/22	20:55 - 22:24
Mo/Tu	1/ 2	20:35 - 4:07	Fr/Sa	12/13	3:02 - 3:54	Mo/Tu	22/23	20:56 - 23:10
Tu/We	2/ 3	20:36 - 4:05	Sa/Su	13/14	3:36 - 3:53	Tu/We	23/24	20:57 - 23:53
We/Th	3/ 4	20:37 - 4:04				We/Th	24/25	20:58 - 0:32
Th/Fr	4/ 5	20:38 - 4:03	Su/Mo	14/15	- - -	Th/Fr	25/26	20:59 - 1:08
Fr/Sa	5/ 6	21:05 - 4:02	Mo/Tu	15/16	- - -	Fr/Sa	26/27	21:00 - 1:43
Sa/Su	6/ 7	22:12 - 4:01	Tu/We	16/17	- - -	Sa/Su	27/28	21:01 - 2:16
			We/Th	17/18	FULL MOON			
Su/Mo	7/ 8	23:15 - 3:59	Th/Fr	18/19	- - -	Su/Mo	28/29	21:02 - 2:51
Mo/Tu	8/ 9	0:12 - 3:58	Fr/Sa	19/20	- - -	Mo/Tu	29/30	21:02 - 3:26
Tu/We	9/10	1:03 - 3:57	Sa/Su	20/21	20:54 - 21:35	Tu/We	30/31	21:03 - 3:40
We/Th	10/11	1:47 - 3:56				We/Th	31/ 1	21:04 - 3:40

Weekend Sa/Su	Sun Set	Sun Rise	Mercury Rise	Vi	Venus Rise	Vi	Mars Set	Vi	Jupiter Set	Vi	Saturn Set	Vi	Vi=Visibility
29/30	19:02	5:36	5:14	-	5:10	7	20:25	6	19:28	9	19:41	9	-3 brilliant
6/ 7	19:07	5:30	Set		5:07	7	20:21	6	19:08	-	19:17	-	0 conspicuous
13/14	19:12	5:25	19:41	9	5:05	8	20:17	7	Rise		Rise		3 moderate
20/21	19:17	5:20	20:25	5	5:05	9	20:12	9	4:52	8	4:59	-	6 naked eye limit
27/28	19:21	5:17	20:57	3	5:07	-	20:07	-	4:30	6	4:34	8	9 binoculars limit

By Erich Karkoschka

Star Parties & Events

Desert Museum Public Star Party [West]

May 6 (Saturday)

TAAA Member, John Polacheck, has been working for some time now with the folks at the Desert Museum to co-host a large public star party. That event will take place on Saturday, May 6th. The TAAA telescope volunteers will set up their equipment in the front two rows of the main parking lot and in the circular drive close to the museum entrance courtyard. Set-up will be from 6:00 pm to 6:30 pm. Observing will begin at 7:00 pm and end about 10:00 pm. The event coincides nicely with the interesting conjunction of the planets Saturn, Jupiter, Mars, and Venus. We will have a 3-day old Moon to observe. This is shaping up to be a fun event, so mark your calendars!

Catalina Foothills High School [North]

May 8 (Monday) No. of Scopes: 4-6

This will be the first star party the TAAA has supported at this school. The school is located at 4300 E. Sunrise Drive approximately 1/3 mile west of Swan Road and is on the south side of Sunrise. Go south on Calle Del Marques (there is a stoplight here), which is between Swan Rd. and Pontatoc Rd. You will enter a parking lot that is in front of the school. Veer left and follow a driveway south. You will pass some tennis courts (on your left) and enter the south parking lot. Park here. The set-up area is located on the softball field which is located southeast of this parking lot. Set-up will be at 7:00. Observing will run from 7:30 pm to about 9:30 pm. A Star Party leader is needed for this event. A sign up sheet will be available at the May meeting.

Roadrunner Elem. School [Northwest]

May 10 (Wednesday) No. of Scopes: 8-12

The school is located at 16651 W. Calle Carmela. Take I-10 west to the Avra Valley Rd exit and proceed west for approximately 11-12 miles until you arrive at Anway Rd (there will be a Valley Mart gas station at this intersection). Turn right and proceed north for approximately 3 miles to Calle Carmela. Turn left here. The school will be on your left just after you turn. The set up area will be in a courtyard area south of the amphitheatre. Set-up will start at 7:00; however, there will be a spaghetti dinner and Eegees available to TAAA volunteers beginning at 6:00 pm. Observing will run from 7:30 pm to about 9:00 pm. A Star Party leader is needed for this event. A sign up sheet will be available at the May meeting.

Esperero Canyon Middle School [North]

May 11 (Thursday) No. of Scopes: Unknown

The school is located at 5801 N. Sabino Canyon Rd which approximately 1/3 mile north of Sunrise Dr. and Sabino Canyon Rd. Proceed north from this intersection. You will pass Canyon View Elementary School (on your left). The next series of buildings is Esperero Canyon Middle School. Turn left into the school parking lot. The set-up area will be at the soccer field, which is northwest of the parking lot. Set-up will be between 6:30 and 7:00 pm.

Star Parties & Events (cont.)

Observing will run from 7:00 pm to about 9:00 pm. A Star Party leader is needed for this event. A sign up sheet will be available at the May meeting.

Valencia Middle School Star Party [Southwest]
May 12 (Friday) No. of Scopes: 3-5

The school is located at 4400 W. Irvington Rd. Take I-10 east to the Irvington Rd exit and proceed west (right) at the exit light. Proceed west for approximately 4 miles passing through the intersections of Midvale Park Rd and Mission Rd, both of which have stoplights. The school will be on your right. Proceed into the parking lot. The set-up area will be at the basketball and volleyball courts. Set-up will be at 7:00 pm. Observing will run from 7:30 pm to about 9:30 pm. A Star Party leader is needed for this event. A sign up sheet will be available at the May meeting.

UofA Universities Conference [North]
May 16 (Tuesday) No. of Scopes: 5

For a donation, the TAAA will support this activity at the Westin La Paloma Resort. The resort is located at 3800 E. Sunrise Drive. Directions to the resort will be available at the May meeting. This event is one of the last day's activities for the approximately 350 Western Association of College and University Business Officers attending the conference. The telescope viewing will be part of the evening's activities, so all attendees will not observing at the same time (We hope!). Set-up will be at 7:30 pm with observing starting at 8:00 pm and lasting to about 10:00 pm. The observing will take place on the Arizona Deck just off of the large Canyon Grand Ballroom. A transport cart will be available to move the telescope equipment from the front parking lot into the resort and out to the deck. A Star Party Leader is needed for this event. There will be a sign-up sheet at the May meeting.

Sahuaro Girl Scouts Council Star Party [Northeast]
May 26 (Friday) No. of Scopes: 3-4

This event is located at 3101 N. Sabino Canyon Rd. Take Tanque Verde Rd. east to Sabino Canyon Rd. and proceed north (left) on Sabino Canyon Rd. Continue north and turn left into the Girl Scout facility which is just before the Tanque Verde Creek bridge. The Girl Scouts will be participating in other events and will be split into round robin groups of 30-35 at a time. The set-up area will be on the northwest part of the property near the creek. Set-up will be at 7:00 pm. Observing will run from 7.30 pm to about 9:30 pm. A star party leader is needed for this event. A sign up sheet will be available at the May meeting.

Smithsonian Study Group [West]
May 27 (Saturday) No. of Scopes: 3

This star party will be held at Vega-Bray Observatory in Benson. Ed Vega could use a few extra hands to operate some of his telescopes plus about three additional scopes to be set up outside. The guests will arrive about 6:45 pm for a box dinner TAAA Volunteers will be provided with a box dinner as well. Set-up at 6:30 pm with observing from 7:30 pm to 10:00 pm. A Star party Leader is needed for this event. There will be a sign-up sheet at the May meeting.

TAAA Empire Ranch Star Party
May 27 (Saturday)

The Empire Ranch has been our normal dark-sky observing site for quite a number of years. Empire Ranch is about 4000 feet in elevation, so be prepared for cold temperatures and try to arrive before sunset. Stay as long as you like, but let everyone know when you are ready to leave; someone may be taking astrophotos. Bring a telescope if you have one, but you don't need one to attend. Any member would be glad to let you look through their telescope. There are no restroom facilities at the site, so be prepared. Attendees should park their vehicles either perpendicular to the airstrip facing toward the center of the strip or parallel to the airstrip along either side facing west. That way when you are ready to leave, you will not have to backup and turn on your bright white backup lights. One nice advantage of belonging to the TAAA is the opportunity to observe among friends. Help in finding an object or the sharing of equipment always goes on at our star parties. If you haven't attended a star party yet, you're missing the best part of belonging to the TAAA. See the directions to Empire Ranch on the outside flap of this newsletter.

TIMPA Site News

TIMPA Update

There's not a lot to report this month. A letter has been submitted to Kitt Peak for consideration regarding the expensive quotation that was received for transporting the dome and support building from the storage area on the side of the mountain up to the parking lot. Due to the slow nature of the progress of the project, sub-committee meetings will be called on an "as needed" basis. Anyone interested in attending either the Long Range Planning or Site Prep Sub-committees, should contact Terri Lappin at 579-0185 or Andrew Cooper at 795-3585, respectively.

What is TIMPA, Anyway?

We forget that not all TAAA members know about the TIMPA project. For our new members, this explanation will appear in all future newsletters.

TIMPA stands for; Tucson International Modelplex Park Association. It is a parcel of land (approx. 160 acres) located about seven miles west of the Saguaro National Park West. The property is leased from the City of Tucson by the TIMPA organization and is to be used as a specialty park. The TIMPA organization flies radio-controlled model

TIMPA Site News (cont.)

airplanes at the site. The Southern Arizona Rocketry Association (SARA) also uses the site to launch model rockets.

About three years ago, TAAA member, John Polacheck, heard about the site and inquired if the TIMPA organization would be interested in acquiring another partner, the TAAA. The TIMPA group was very interested because the relationship would be non-competing. TIMPA and SARA use the site during the day and the TAAA would utilize the facility at night. The TAAA used the site, by permission, for about a year for scheduled star parties, such as Beginners Star Parties. On July 14th, the TAAA and the TIMPA organization signed a letter of agreement allowing the TAAA unlimited use of the site for scheduled star parties as well as member use at other times. Ultimately, the TAAA intends to develop an observing area on the site that will include an observatory for the club's 16" reflector telescope. Many club and joint benefit projects will be undertaken in the next several months to improve the facilities at the site:

1. Run electricity and telephone line to our observing area and on to TIMPA's ramada. Also, run a water line to our site. (Completed - 10/9/99)
2. Construct a secure storage cage in the TIMPA Barn. (Completed - 12/11/99)
3. Move the TAAA property from the mini-storage unit to the new security cage in the TIMPA Barn. (Completed 12/12/99)
4. Construct permanent bathroom facilities. (Tentative schedule 2nd quarter 2000)
5. Construct observatory to house club's 16" telescope. (Tentative schedule 2nd quarter 2000)
6. Upgrade club's 16" telescope. (Tentative schedule 2nd quarter 2000)
7. Construct additional site improvements. (Schedule to be determined)

Watch the newsletter for announcements about TIMPA activities and how you can help.

TAAA Board of Directors Meeting—April 13, 2000

EDITOR'S NOTE: Minutes of Board of Directors meeting were not available at press time.

Desert Skies Classified

FOR SALE: 10" f/5.6 Newtonian telescope on Dob mount. Parks optics, Al mirror cell, 2" Meade metal focuser with adapter, rotating tube in cradle, Teflon, finderscope, 25mm eyepiece, asking $675. 6" f/10 Newtonian on sturdy Criterion equatorial mount with motor. Great planetary scope. Metal tube and cell, Meade 1 1/4" metal focuser, finderscope, eyepiece. Asking $650. Both scopes at TIMPA star parties for inspection. Call Mike at 743-8161. (8/00)

FOR SALE: Meade Pixtor 416XT CCD Camera. Asking $1250. Call John Baker at 544-4570. (8/00)

FOR SALE: Celestron 7x50 Binoculars with case. Asking $100. Call Duane Niehaus at 290-1722. (8/00)

FOR SALE: Celestron 90mm Spotting Scope, includes: tripod, two 1¼" eyepieces (12mm & 32mm), glare filter, reflex finder, and hard case. Very good condition. $200. cash. Call Eric at 323-8435. (6/00)

FOR SALE: Meade 12" LX200 SCT Telescope, includes: super wedge, tripod, custom storage box on wheels, Telrad finderscope, 2" Astro-Physics barlow, Pentax 40mm eyepiece. Excellent condition, used about 12 times. Asking $5,000. Call Doug at (520) 762-5135 or e-mail at: <clemans@flash.net>. (7/00)

Service: Custom machine shop work - design and manufacture of telescopes and mountings. Fabrication of small parts or repair of existing hardware. For consultation and price quotes, call Duane Niehaus at 290-1722.

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 John Kalas at 620-6502 or e-mail at jckalas@aol.com.

Saturday May 6

Desert Museum Public Star Party

TAAA Star Party Schedule 2000 - Revised

TAAA Meetings and Club Star Parties Schedule – Year 2000 (Revised)

	MEETINGS		STAR PARTIES		
MONTH	MONTHLY MEETING	BOARD MEETING	EMPIRE RANCH	TIMPA	NEW MOON
January	1/7	1/13	1/1	1/8	1/6
February	2/4	2/10	2/5	1/29	2/5
March	3/3	3/9	3/4	2/26	3/6
April	4/7	4/13	4/1	*	4/4
May	5/5	5/11	~	4/29^	5/3
June	6/2	6/8	5/27	6/3	6/2
July	7/7	7/13	7/1	+	7/1
August	8/4	8/10	7/29	8/5	7/30
September	9/1	9/7	9/2	8/26	8/29
			9/23	9/30	9/27
October	10/6	10/12	10/28	10/21	10/27
November	11/3	11/9	11/25	11/18	11/25
December	12/1	12/7	12/23	12/16	12/25

* Saturday, 4/8 – Telescopes For Telethon 2000 Public Star Party
^ Saturday, 4/29 – Joint TAAA/TIMPA Activity (Flying/Observing)
~ Saturday, 5/6 – Public Star Party at the Desert Museum
\+ Saturday, 6/24 – TAAA Annual Picnic at Vega-Bray Observ.

NOTE: Changes indicated by grey highlighting.

Constellation Report by Chris Lancaster

Ursa Minor

the little bear

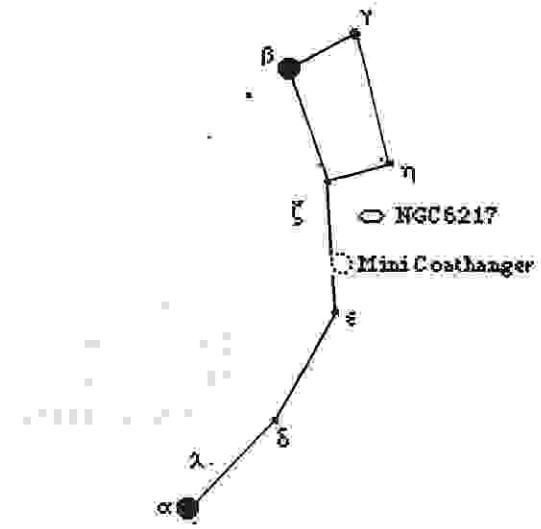
Without many bright stars, Ursa Minor might be just another overlooked constellation, but it holds a very important place in the sky and in legend. Greek folklore says that Ursa Minor is Arcas, son of Callisto, the maiden who attracted the desires of Zeus. This aroused the jealousy of Zeus's wife, Hera, who turned Callisto and Arcas into bears. Zeus then placed the bears in the sky—Callisto as Ursa Major and Arcas as Ursa Minor. This only angered Hera a second time, so she saw to it that the two bears circle the celestial pole endlessly without the luxury of setting below the horizon to seek rest.

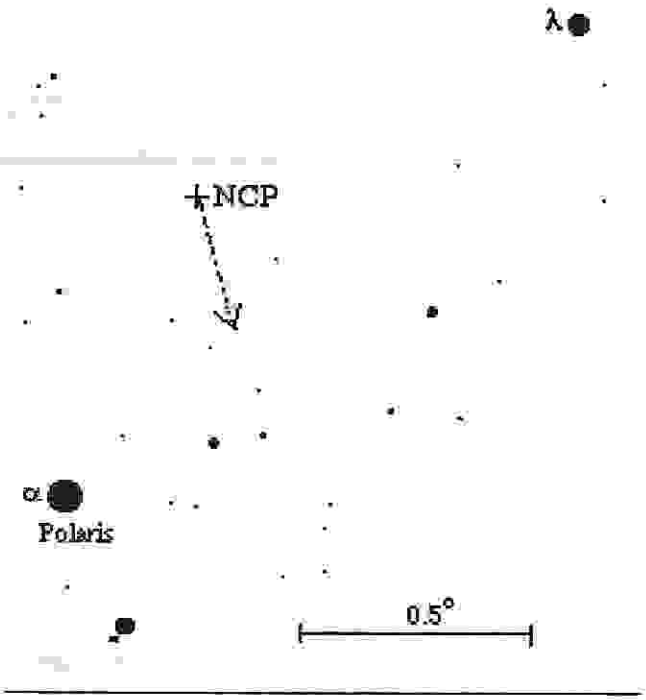
There have been a few different pole stars throughout history as the Earth's axis follows its 25,800 year long precession cycle. Currently that role is held by Polaris, but in centuries past Beta Ursae Minoris and Thuban (Alpha Draconis) have held that honor. In every case the pole star has been seen with reverence as representing the anchor of the heavens, the summit of a cosmic mountain where the gods of the sky reside, a symbol of consistency and endurance, and, in more modern times, a faithful guide star for ocean voyagers. The chart in the opposite column showing the stars near Polaris illustrates the precise position of the north celestial pole (NCP) and the distance and direction of its movement over the next 50 years.

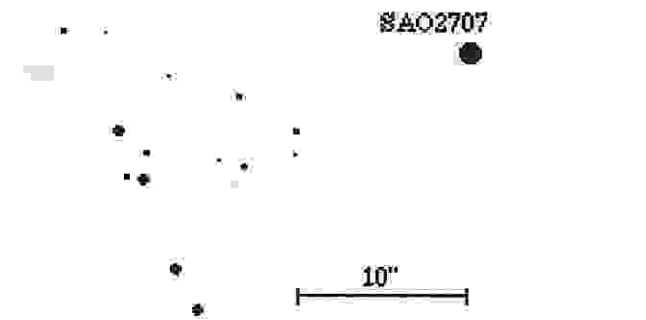
Detailed observations of Polaris show that it is both a double and a variable star. Its oscillations, however, are extremely small—on the order of 0.1 magnitude over a period of 4 days. Amateur observers will have more satisfaction viewing it as a binary star. The magnitude 2 (spectral type F8) primary star is separated by 18" from the magnitude 9 companion.

An interesting asterism can be found 1.8° SSW from Epsilon (ε) Ursa Minoris, or up from the horizon and to the left if facing north, near the 7.7 magnitude star SAO2707. (For those of you with equatorial mounts, especially fork mounted Schmidt-Cassegrains, you may want to turn the telescope 180 degrees so the telescope's axis is pointing to the celestial equator to make it easier to navigate so close to the pole.) It's called the mini coat hanger from its resemblance to the "big" coat hanger asterism in the Summer Milky Way running through the southwest part of the constellation of Vulpecula. While the larger one measures 1.5° from end to end, this one measures a tiny 17'.

The best deep sky object Ursa Minor has to offer is the galaxy NGC6217. Its a spiral measuring approximately 2.5'x 2.0' and glowing at magnitude 12.1. It lies about 2/3 of the way along a line from Epsilon (ε) to Eta (η), or RA 16h 32.6m Dec +78° 12'.







Mini Coat hanger