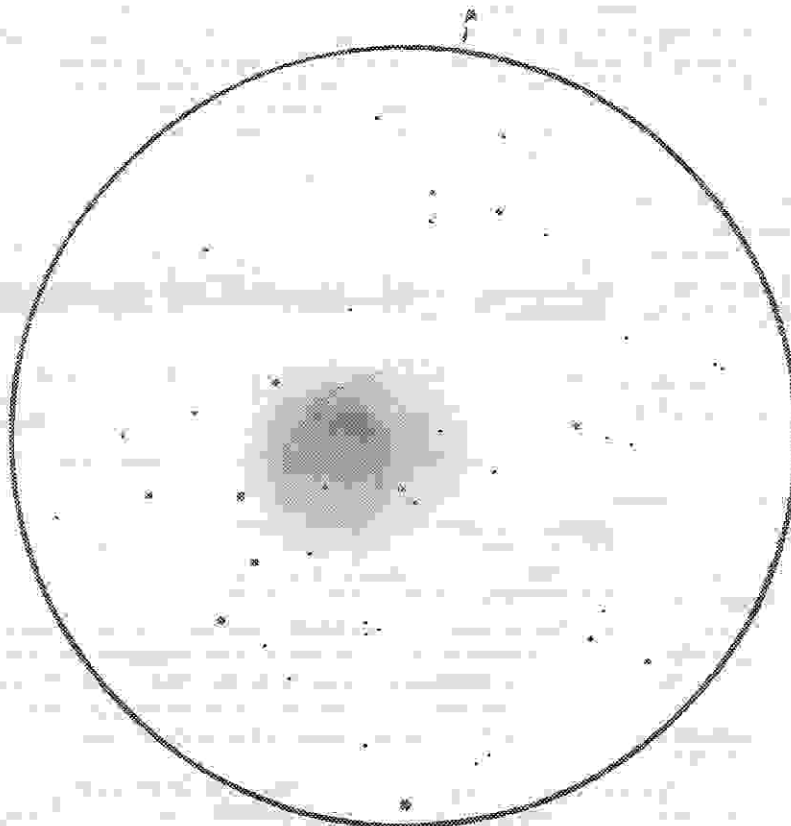


Desert Skies

OCTOBER 1990

Comet Levy



August 18, 1990

15cm f/10 refractor

Mag. 48x field: 58'00"

Seeing: 5-7 (0-10) Trans: 5.5m

Michael E. J. ...

MEETINGS

GENERAL MEETINGS: -Friday, October 5, 7:30 P.M. at Steward Obs. lecture room.
A talk on Astronomical Clocks will be given by Ewen Whitaker

Friday, November 2, 7:30 P.M. at Steward Obs. lecture room
John Hill will be the speaker.....

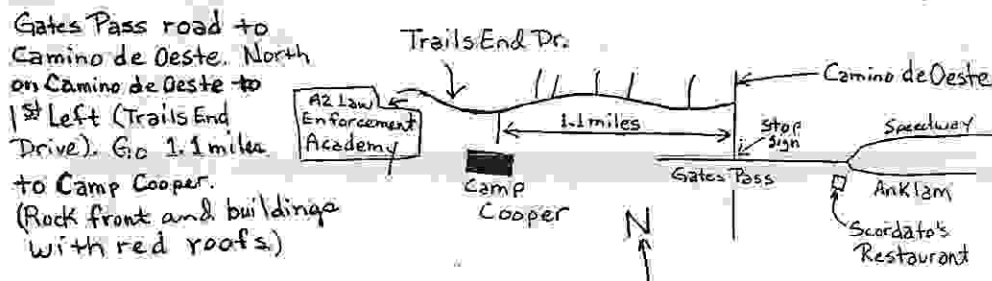
Friday, December 7, 7:30 P.M. at Steward Obs. lecture room
MEMBER'S NIGHT - so think about your "topic" now.....

STAR PARTY - Saturday, October 20 at Empire Ranch.

EXECUTIVE MEETING - THURSDAY, October 11, 7:30 P.M. at Flandrau Planetarium

THURSDAY, OCTOBER, 11th -- STAR PARTY AT CAMP COOPER

This special star party at Camp Cooper is for students of Blenman Elementary School. This star party is part of their astronomy unit. Camp Cooper is located against the Tucson Mountains, is owned and operated by the Tucson Unified School District for their students in 4th to 6th grades. Remember, sunset is now about 5:30pm so try to arrive as early as possible. Please let me know if you plan to attend. Thanks. -Terri (790-5053)



TAAA EXECUTIVE

President	Tim Hunter	299-2672
Vice-President	Dean Ketelson	293-2855
Executive Sec.	Dick West	1-762-5931
Recording Sec.	Sharon Niehaus	299-7328
Treasurer	Debbie Smith	296-4780
Member-at-Large	Bob Goff	790-1452
Chief Observer	Terri Lappin	790-5053
Membership coordinator	Terri Lappin	790-5053
Past President	Duane Niehaus	299-7328
Desert Skies ed.	Dolores Hill	325-9820
Asst. ed.	Rik Hill	

Desert Skies Publishing Guidelines

- *All articles, announcements, news etc. must be submitted by the 20th of the month. Materials received after that date will appear in the NEXT issue.
- *All submissions are retained by the editor unless prior arrangements are made.
- *Articles, artwork, and photos should be camera ready. Photos should be screened.
- *We will not publish slanderous or libelous material!

Send articles, announcements etc. to Desert Skies c/o Dolores Hill 4632 E. 14th St., Tucson, AZ 85711 (phone: 325-9820) OR Lunar & Planetary Lab, U of A (621-6951).

MEMBERSHIP IN THE TAAA

Individual Membership	\$20.00
Family Membership	\$25.00
Senior Citizen (over 60)	\$18.00
Sky & Telescope subscription (optional)	\$16.00

Rates for membership in the TAAA are given above. Members can subscribe to Sky & Telescope at the time of membership renewal, saving over 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, P.O. Box 41254, Tucson, AZ 85717. It is best to pay your dues 2-3 months before your membership actually expires.

4 EASY STEPS TO MEMBERSHIP RENEWAL

1. Pay your dues 2-3 months early. Your month of membership expiration is listed on your newsletter mailing label.
2. a) Decide if you want Sky & Telescope, then add \$16 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.



HALLOWEEN -- OCTOBER 31st

Are you expecting any MARTIANS on your doorstep this Halloween? Treat them to a view of their home planet. Witches, ghosts and goblins are sure to enjoy a view of the moon, then only two days away from full! Use low power and a neutral density filter to cut down image brightness. High power is fine if you have a clock drive. (Hint: a smaller telescope is less intimidating to a youngster.)

If there aren't many sidewalk ghouls in your neighborhood, you might try the elementary school or a church in your area. They may have scheduled a neighborhood Halloween Party and would welcome this special treat!

TUCSON CHILDREN'S MUSEUM STAR PARTY

The TCM would like to have a few telescopes, equipped with solar filters, available on Saturday, October 27th, to observe the sun. The Museum is located at 300 E. University Blvd. (near the intersection of University and 4th Ave.) and is open from 10am to 5pm on Saturdays. We will set up our telescopes near the entrance and can park our cars nearby for unloading. If you need more details call Terri at 790-5053.



WANTED: Members to bring eyepieces to star parties for comparison through different telescopes...Patrick Craig would like to compare as many as possible before making a purchase. It sounds like an activity that could benefit many amateurs for future reference! (The results would make a great article for Desert Skies!)

FOR SALE: The following issues of the Astrograph, Vol.8 #1 color, Vol.12 #4,5,6, Vol.13 #1,2,3,5,6, Vol.14 #1,2,3,4,5,6, Vol.15 #1,2,3,4,5,6, Vol.16 #1,2,3,4,5,6, Vol.17 #1,2,3 ALL FOR \$15.00.

Also, ZX80 Sinclair with 8k basic ROM with hookup wires, Syntax magazine in binder Vol1#2, Vol2#112, Vol3#112, Vol4#1.....\$25.00
Call evenings and ask for Mike (297-2781).

FOR SALE: 9 1/2" Meade Fibrelite tube, 48" long with endrings, brand new...\$95.
Call Andrew Meyer 883-2193 (please not after 10 P.M. - leave a message on the machine).

FOR SALE: Yashica 35mm SLR camera/50MM lens...\$150. Call Patrick Craig (750-8046).

FOR SALE: 6" Parks Dobsonian telescope- includes 25 mm Kellner eyepiece, 6x30 finderscope, Novak curved spider...\$300

Astroscan 4", f/4 from Edmund Scientific/28 mm RKE eyepiece...\$100

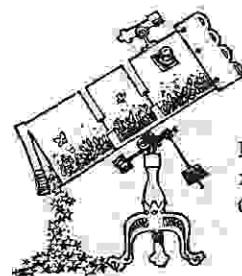
50mm Parks Kellner eyepiece.....\$20

2" Parks rack & pinion focuser.....\$20

1.3" Diagonal holder (no mirror) & spider for 6" scope.....\$10

7" Parks tube for 6" scope, 37" long.....\$20

Call Jeff Bridges at 293-8976 if interested.



FOR SALE: Celestron 8" with 7x50 finder, several eyepieces, light pollution filter, sturdy tripod base - in excellent condition...\$975/best offer.
Call Len Schess 628-8700 (day) or 299-6460 (night).

MIRRORS TESTED by Bob Goff.....

STEEL SHAFTS for your next telescope...SAE 1026 carbon steel 2"OD 1/4"wall.
Cut your own. I'll supply the saw...\$10.00/foot. Call Bob Goff at 790-1452.

FOR SALE: Heavy 8" diameter steel column on a triangular steel base with a rising heavy tube by rack & pinion. Min height 5 ft. and max. height 7 ft. It was a NASA tooling stand- would be good for a large refractor etc...\$500.
Will trade 3 1/2" Alvan Clark refractor on tripod mount for Mac II computer.
Call Mr. Sevrilli at 327-0665 (450 S. Rosemount Ave., Tucson 85711)



FOR SALE: Cave 6" F/4 Rich-Field Newtonian reflector with 28mm eyepiece, personally refigured primary mirror, on Edmund Scientific equatorial mount with electric clock drive, 1" R.A. and Dec. shafts,\$350.
Call Duane Niehaus 299-7328.

OBSERVER'S REPORT

Star Party October 20 Empire Ranch

The October Star Party will be held on Saturday the 20th at Empire Ranch. Hopefully, we will have clear skies. As of this writing it looks as if the All-Arizona Star Party will be clouded out this year.

A number of interesting things are happening in the skies above Tucson this month. Try looking for Mira which is at it's brightest this month. It will be in the eastern sky, southeast (by 20 degrees or so) of the star marking the southeast corner of the Great Square of Pegasus. Mira is a pulsating variable star which actually expands and shrinks over a period of 11 months. The star changes color and temperature as it expands and shrinks. A good astronomy textbook will describe the Hertzsprung-Russell (H-R) Diagram which classifies stars according to color, temperature, and absolute brightness. Mira actually demonstrates how the color of a star is dependent on its brightness and temperature. Observe Mira every few nights over the next six months and see if you can detect a reddening as it goes from about 3.5 magnitude at brightest to 9.5 magnitude at its dimmest. When Mira appears bright orange it is because most of its energy output is in the visible light region. As Mira cools more of its output is in the infrared (heat) part of the spectrum so it appears fainter and redder to us.

The Orionid meteor shower will be best on October 21 and 22. It is best to watch after midnight and expected rates are around a dozen per hour. Set up a lawn chair and watch the stars for a few hours--no binoculars or telescope necessary.

Jupiter will be near the Beehive cluster in Cancer this month. This is a morning object now and Jupiter is the BRIGHT object in the east. Apparently the south belt has not returned yet. Mars is nicely placed for observing this month and through the beginning of next year. Try observing it with color filters. Orange and blue filters are recommended for starters (telescopes of eight inches or smaller). Larger telescopes work better with a red filter. The filters help to increase the contrast of the Martian features.

I hope everyone had a chance to see Comet Levy last month. It will be difficult to impossible to see it this month. Periodic Comet Encke is visible in the morning sky. It will reach 7 or 8 magnitude and will be in Leo during the first part of October.

At the last regular meeting I made some comments regarding the responsibilities of the Chief Observer and asked for comments regarding the Observer's Report, both written and oral. Member's comments have indicated that information about the events that are covered in the astronomy magazines are appreciated so I will continue to mention these items at the regular meetings. You should see a new feature in upcoming issues of Desert Skies--a calendar of celestial events. I would once again like to institute a 'beginners' astronomy lesson, perhaps from 7 to 7:15pm before the meeting officially starts. I would cover general astronomy topics or those that are important to know for a better understanding of the night's featured speaker. Let me know if this is a good idea or not.

Terri Lappin, Chief Observer

EXECUTIVE MEETING
SEPTEMBER 20, 1990

Members present: Derald Nye, Debbie Smith, Tim Hunter, Dean Ketelsen,
Lou Avanzi, Patrick Craig, Ed Vega

1. The upcoming All Arizona Star Party was discussed. Several of the members present at the meeting will bring tables. It appears that no one will be able to spend the day to watch telescopes. There have been several letters from out of state asking about the star party. A CCD will be brought to the Saturday night session.
2. Speakers for upcoming meetings:
October - Ewen Whitaker will speak on astronomical clocks.
November - John Hill.
December - Members Night. If any member has a presentation he or she would like to give please see a member of the executive.
The talk should be no longer than 20 minutes.
3. Refreshments: October - Patrick Craig
November - Duane and Sharon Niehaus.
4. The Goldmine site will be auctioned on November 11, 1990. The minimum bid is 130,000 dollars. There is still a possibility that we could deal with the person who buys the land. Inclement weather the 15th of September prevented further evaluation of the Tombstone site. The executive decided to meet there in October. The Mt. Hopkins site was also discussed. This site is near Astronomy Vista. The executive will set up a meeting there to evaluate this site.
5. Debbie Smith gave the treasurer's report.
6. Since no club member has expressed interest in the recently acquired dome, it will be offered to the person who first wanted to purchase it.
7. A committee has been formed to secure funds for the telescope. The members are Ed Vega, Brad Becker, Bob Goff, Andy Meyer, and Dan Knauss.
8. As many of you are aware, the temperature in 202 was very uncomfortable the last meeting. Dean has contacted the proper individuals and has asked for their assistance in keeping the temperature at the proper level. Members are asked to please help ensure that 202 is clean before we leave.
9. Dean discussed adding a new feature to the newsletter. It would be a calender of astronomical events. He also discussed a telescope that our club may be interested in obtaining. It is a 24 inch Cassegrain. The mirror would have to be refigured. The gentleman who now owns it may be willing to donate it to a non-profit organization. A letter may be sent to him to express our interest and that the telescope may fit in our future plans.
10. An order for T-shirts and sweatshirts will be placed. If you would like to purchase one, please see a member of the executive.

Dick West
Executive Secretary

Campout - Starparty at Chiricahua National Monument!

This makes the third trip we have done as a group to this excellent dark sky site. Unfortunately, we got rained out last year, but we still had a lot of fun cooking out, exchanging stories, and hiking the next day. The format remains the same this year. The group campsite has been reserved in our name, and we are required by park rules to camp there. The observing part will take place at Massai Point, which is at 7000 ft altitude, and about 3 miles drive from the campsite.

All this takes place on 13 October. I'm sending fliers to the monument to post at the campground and park visitor center, so we are likely to get a couple dozen visitors for the early part of the evening. The first year there was a Boy Scout troop, and if you enjoy inspiring youngsters, you might want to think about attending. Even if you prefer observing alone, campers tend to bed down early and the majority of the night is yours. The skies there are about as dark as you can get in southern Arizona. Sierra Vista and Tucson are barely detectable to the west, and the first year, the gegenshein was visible. I encourage all hearty outdoor types to come on down!

Chiricahua National Monument is located about 120 miles southeast of Tucson, about 40 miles south of Willcox. It is a hard two hours drive, and I encourage you to leave in the late morning to arrive mid-afternoon. If you have never been there before, you may want to arrive earlier to do some sightseeing. I'm suggesting that we meet at the group campsite at 3pm to set up camp and eat before heading up to Massai Point. Don't forget it will be cold, possible in the low 40's or even the 30's. Better overdressed than cold! Please contact me or leave a message on my home phone if you plan to attend or need more information - if weather is questionable, the trip may be canceled, please stay in touch if cloudy.

-Dean Ketelsen 293-2855

Telescope Design Committee Meeting

The 30" Telescope Design Committee met at Bob Goff's house on 9 September. Dean Ketelsen presented a preliminary design for the telescope truss (presented in New Desert Skies). It was reported by Bob Goff that the local company Superior Steel would provide material at cost for telescope construction and provide cutting at no charge. This was due to the efforts of clubmember Vince Hagerlin, who works at Superior Steel. Many thanks to Vince for his efforts on behalf of the club! Bob Goff is designing a Ross null lens for the final figuring of the mirror. Before constructing the lens however, Dean will check with Optical Sciences about access to the Optics Shop for final figuring against a Flat. We are awaiting final design analysis of the mirror support by Larry Stepp before doing the final design for the primary cell. When that design is done, construction of the cell and telescope truss can commence. Bob has formed a fundraising group for raising money for the telescope project. Current volunteers include Brad Becker, Bob Goff and Dr. Ed Vega.

The next meeting will again be held at the home of Bob Goff on 7 October. It is open to all clubmembers with an opinion, suggestions, or want to help out on the 30" project. For new members needing directions to Bob's, call him at 790-1452, or the undersigned.

-Dean Ketelsen 293-2855

Amateur Astronomy Lifestyles: Music

In the last couple of years, Astronomy Magazine has published reviews on several pieces of New Age music, also known as Contemporary Classical. This music, often called Spacemusic, is what I am addressing, not New Age Pop.

Many people are only vaguely aware of the existence of Contemporary Classical Spacemusic. It is mainly ignored by the mainstream because it is conceptually new to the western ear. This music does not fall into the art-and-entertainment type we are used to. Using a purely western point of view, I can sympathize with those who view astronomy and music as a mixed match. Spacemusic, though, taps into east-west traditions that precede Euro-American music, and the basic function of east-west traditions is a re-attunement with the self and nature.

Generally, Spacemusic utilizes modern electronic and acoustic instruments, with the composition constructed over electronically sequenced rhythmic patterns. It creates feelings of vast spaciousness, is purposely unfocused and, to the receptive listener, it motivates one introspectively. That description is not too far from one that can be given to deep sky observing.

For myself, this music helps make the transition from the hubbub of the work routine to that of exploring the Universe at large an easy one. Below is a list of what I've experienced as being good Spacemusic for doing astronomical observations. If you need to become more familiar with New Age Music, Public radio station KUAT presents a one-hour program of this music called "The Hearts of Space", which airs Sunday evenings at 10 PM.

"Return of the Comet" by David Lange
"Structures from Silence" by Steve Roach
"Planetary Unfolding" by Michael Sтерна
"And the Stars Go with You" by Jonn Serrie
"The Way Home" by Kevin Braheny
"Dreamtime Return" by Steve Roach

Michael E. Sweetman
SKY CREST OBSERVATORY

Request for Volunteers!

At the last general meeting, there was interest in a monthly astronomical calendar appearing in Desert Skies. David Oesper of the Ames Area Amateur Astronomers has been putting one together for years for their club and with some arm-twisting agreed to do ours for a month or two as an example. If you enjoy it and would like to take over a similar production for TAAA, we would all appreciate it, and David has prepared some notes as a guide for its preparation (Dave claims it takes about 2 hours to put it together). If you would like to volunteer, contact me, Newsletter Editor Dolores Hill, or Chief Observer Teresa Lappin.

-Dean Ketelsen 293-2855

CELESTIAL CALENDAR for October 1990:

Mon. Oct. 1	Lunar libration at minimum (east limb exposed)
Tue. Oct. 2	Jupiter 0.3° N of 4th magnitude Delta (δ) Cancri (am)
Wed. Oct. 3	Only recorded occultation of Mars by Venus is observed, 400 years ago today (1590) 200-inch Hale primary mirror completed, 1947
Thu. Oct. 4	FULL MOON , 5:02 am MST. The Harvest Moon.
Fri. Oct. 5	Edwin Hubble identifies Cepheid variable star in the Andromeda galaxy (M31) and calculates its distance, 1923
Sat. Oct. 6	Moon at perigee (363,245 km) Lunar libration at minimum (south limb exposed)
Sun. Oct. 7	Luna 3 (USSR) takes 1st pictures of the Moon's farside, 1959
Mon. Oct. 8	Mars near the Moon (am) Draconid meteors (nominal peak: noon MST)
Tue. Oct. 9	Moon reaches its greatest northern declination this month (+27°) Shortest Twilight of the Year, 1 ^h 21 ^m (Tucson)
Wed. Oct. 10	LAST QUARTER MOON , 8:31 pm MST Formal dedication of the Very Large Array (VLA) near Socorro, New Mexico ten years ago today (1980)
Thu. Oct. 11	Heinrich Olbers, German astronomer, born 1758
Fri. Oct. 12	Jupiter near the Moon (am) 1st comet discovered by photography: Comet 1892 V by Edward Emerson Barnard, 1892
Sat. Oct. 13	Piscid meteors (nominal peak: 5 am MST) Lunar libration at maximum (west limb exposed)
Sun. Oct. 14	Edward Sabine, English astronomer, born 1788
Mon. Oct. 15	Asaph Hall, American astronomer, born 1829
Tue. Oct. 16	Mercury 0.03° N of Venus, but only 5° from the Sun
Wed. Oct. 17	2nd nova of the year discovered in Vulpecula by Kohoutek (1st discovered by Alcock), 1968
Thu. Oct. 18	NEW MOON , 8:37 am MST
Fri. Oct. 19	Lunar libration at maximum (north limb exposed) Subrahmanyan Chandrasekhar, Indian-American astronomer, born 80 years ago today (1910)
Sat. Oct. 20	Mars stationary; begins retrograde (westward) motion Orionid meteors (nominal peak: 10 pm MST; ZHR 25, many faint)
Sun. Oct. 21	Orionid meteors Mercury at superior conjunction; moves into the evening sky Antares near the Moon (pm)
Mon. Oct. 22	Orionid meteors (am) Moon at apogee (405,823 km) William Herschel observes bright red points of light on the Moon's surface during a total lunar eclipse 200 years ago today (1790)
Tue. Oct. 23	Moon reaches its greatest southern declination this month (-26°)
Wed. Oct. 24	Uranus & Neptune near the Moon (pm)
Thu. Oct. 25	Saturn near the Moon (pm)
Fri. Oct. 26	Mars and Pluto at heliocentric opposition FIRST QUARTER MOON , 1:26 pm MST
Sat. Oct. 27	511 Davida (10.7) passes just south of 50 Ceti (5.4) [pm]
Sun. Oct. 28	Closest known approach of an asteroid (Hermes) to the Earth (800,000 km), 1937
Mon. Oct. 29	511 Davida (10.7) passes just north of 49 Ceti (5.6) [pm] Lunar libration at minimum (east limb exposed)
Tue. Oct. 30	Sun enters the constellation Libra
Wed. Oct. 31	944 Hidalgo discovered by Baade, 1920

[Contributed by David Oesper, Ames (Iowa) Area Amateur Astronomers]

Celestial Calendars

For nearly seven years now I have been putting together a monthly sky calendar from various sources for the Newsletter of the Ames Area Amateur Astronomers, and many have found it to be a vital part of our newsletter. Thus when my good friend Dean Ketelsen asked me to submit a "sample" calendar and a short article for the TAAA this month, I was delighted and honored to have the opportunity to share my ideas with you. Hopefully, one of you will be inspired enough to begin providing your newsletter editor with a "Celestial Calendar" each month!

In this month's newsletter are two calendars, Celestial Calendar and Dark Skies. Celestial Calendar is a day-by-day listing of celestial, club, and historical events for the month. Normally, I include all local club events in the calendar, such as meetings, star parties, committee meetings, and other special activities, but since I don't have that information for your club, you will note it is not included here. Another thing I normally include are bright lunar occultations and all grazing lunar occultations and asteroid occultation/appulse events for our local area. Since I do not have this information for the Tucson area, it is not included in the calendar you see here. Another thing you will note is that all times are given as Mountain Standard Time (MST). Sure, I use and think very well in Universal Time (UT), but local times are handier for most of our members. Speaking of time, I commend you folks for not giving in to daylight savings time like the rest of us yahoos. Just when the weather starts to warm up enough in the spring that we no longer have to "suit up for EVA" before an observing session, dark skies are put an hour later and this on top of increasingly late twilight! I wish we could abolish daylight savings time!

Now, back to the subject at hand. The primary source I use for "Celestial Calendar" is the Observer's Handbook of the Royal Astronomical Society of Canada, particularly "The Sky Month By Month" by John R. Percy. I also draw heavily upon Sky & Telescope and the Astronomical Calendar by Guy Ottewell for information. I have over the years accumulated historical dates from a number of sources and keep them in a PFS:File database on my Apple IIgs. I now have at least one event for each of the 366 days (remember: February 29). I would be happy to send a copy of this database to any interested person. Meteor shower information I get primarily from the "Meteor Diary" section of the annual B.A.A. Handbook, and I use an Applesoft BASIC program which predicts meteor shower maxima from Dr. David Meisel of the American Meteor Society. Finally, I keep a list of the dates and times of the following special local events which I calculate each year using Applesoft BASIC programs I have written: latest sunrise, latest onset of morning twilight, latest apparent noon (meridian crossing of the sun), shortest twilight, dates of true equinox ("equal day and night" near the vernal and autumnal equinoxes), times of sunrise due east and sunset due west (vernal and autumnal equinox), earliest sunrise, earliest onset of morning twilight, shortest shadows

(solar meridian crossing on the summer solstice), longest twilight, latest end of evening twilight, latest sunset, earliest apparent noon (meridian crossing of the sun), date(s) when the sun transits the meridian at noon local time, earliest end of evening twilight, and earliest sunset.

Also included with this issue is another useful calendar called **Dark Skies**. Using another Applesoft BASIC program I wrote, I am able to list—for each night of the month—the time period during which the skies should be truly dark (provided the sky is free of clouds and light pollution). These time periods occur when the entire moon is below the horizon and the sun is more than 18° below the horizon (i.e. astronomical twilight). As with the PFS database, I would be happy to send any of you my BASIC programs if you send me a floppy disk.

I hope that by sharing my experiences, at least one of you will begin providing this sort of information on a monthly basis for your newsletter. I am always looking for ways to make these calendars better, so I am eagerly awaiting your ideas and future TAAA newsletters! Good luck!

Clear skies,

DARK SKIES for October 1990:

M/T Oct.	1/2	4:18 a.m. - 4:56 a.m.
T/W Oct.	2/3	none
W/T Oct.	3/4	none
T/F Oct.	4/5	none
F/S Oct.	5/6	none
S/S Oct.	6/7	7:23 p.m. - 7:25 p.m.
S/M Oct.	7/8	7:22 p.m. - 8:16 p.m.
M/T Oct.	8/9	7:21 p.m. - 9:14 p.m.
T/W Oct.	9/10	7:19 p.m. - 10:19 p.m.
W/T Oct.	10/11	7:18 p.m. - 11:26 p.m.
T/F Oct.	11/12	7:17 p.m. - 12:33 a.m.
F/S Oct.	12/13	7:16 p.m. - 1:38 a.m.
S/S Oct.	13/14	7:15 p.m. - 2:41 a.m.
S/M Oct.	14/15	7:14 p.m. - 3:40 a.m.
M/T Oct.	15/16	7:12 p.m. - 4:39 a.m.
T/W Oct.	16/17	7:11 p.m. - 5:07 a.m.
W/T Oct.	17/18	7:10 p.m. - 5:07 a.m.
T/F Oct.	18/19	7:09 p.m. - 5:08 a.m.
F/S Oct.	19/20	7:08 p.m. - 5:09 a.m.
S/S Oct.	20/21	7:07 p.m. - 5:09 a.m.
S/M Oct.	21/22	7:28 p.m. - 5:10 a.m.
M/T Oct.	22/23	8:16 p.m. - 5:11 a.m.
T/W Oct.	23/24	9:07 p.m. - 5:12 a.m.
W/T Oct.	24/25	10:02 p.m. - 5:12 a.m.
T/F Oct.	25/26	11:00 p.m. - 5:13 a.m.
F/S Oct.	26/27	11:59 p.m. - 5:14 a.m.
S/S Oct.	27/28	12:59 a.m. - 5:14 a.m.
S/M Oct.	28/29	1:59 a.m. - 5:15 a.m.
M/T Oct.	29/30	3:02 a.m. - 5:16 a.m.
T/W Oct.	30/31	4:07 a.m. - 5:17 a.m.
W/T Oct.	31/1	5:15 a.m. - 5:17 a.m.

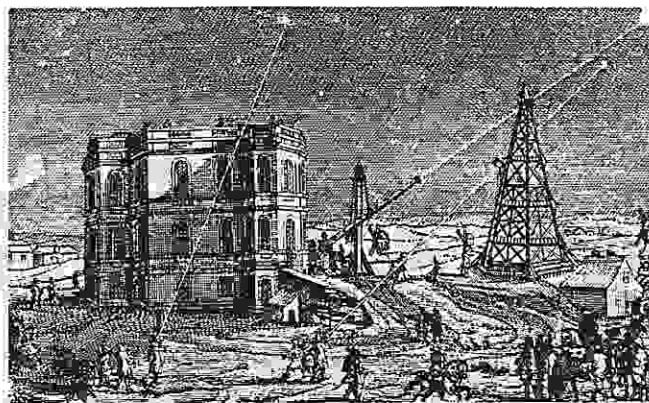
Times listed are for Tucson, Arizona when
 (1) Moon is below the horizon
 (2) Sun is > 18° below the horizon
 (astronomical twilight)

[Contributed by David Oesper, Ames (Iowa)
 Area Amateur Astronomers]

David Oesper

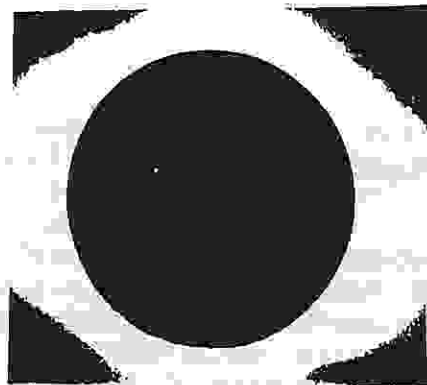
David Oesper
 President
 Ames Area Amateur Astronomers
 1208 Wilson Ave.
 Ames, Iowa 50010

E-mail: F1.DAO@ISUMVS



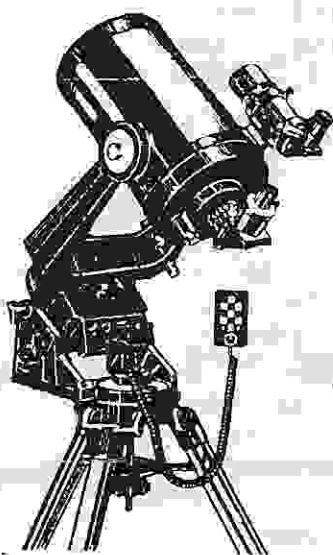
Above is a nighttime view of the Paris Observatory

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