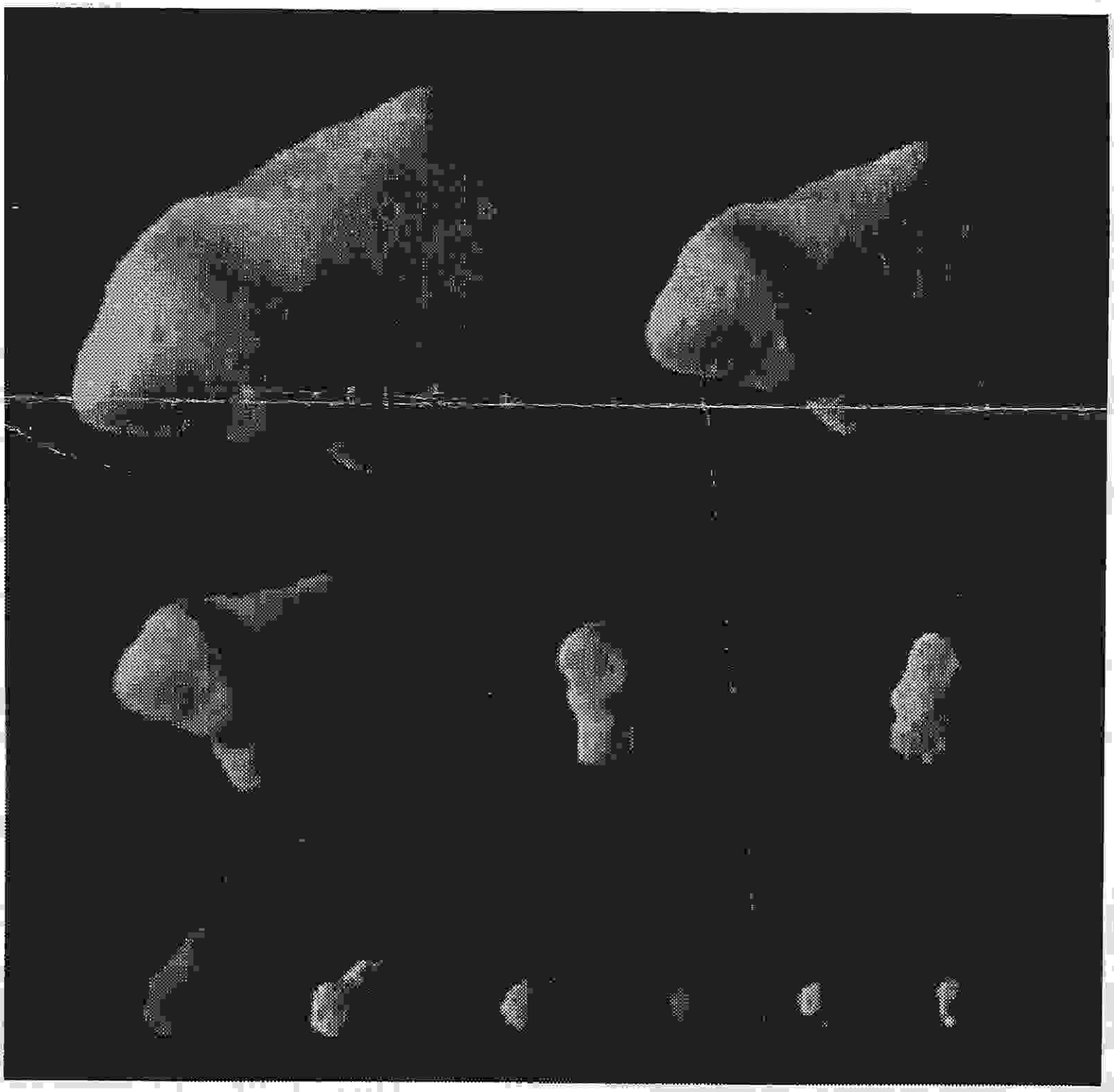
Desert Skies

March, 1993

The Newsletter of the Tucson Amateur Astronomy Association (TAAA)



GENERAL MEETING - Friday, March 5, 7:30 P.M. at the NEW Steward Observatory Auditorium. TAAA member David Levy will present a talk on "The Art of Comet Hunting".

6:45 P.M. - pre-meeting **"Beginners lecture"** by Rob Nyberg will be "Getting Started With Open Star Clusters." All are welcome! ("old" Steward obs. room 204). **See enclosed map for directions!**

EXECUTIVE MEETING - Thursday, March 11, 7:30 P.M. at Flandrau Science Center's Conference Room

30" TELESCOPE DESIGN, LAND & FUNDRAISING MEETING - Wednesday, March 17, Location to be announced - call Dean for location.

STAR PARTIES - **Sat., March 13** - Cookout and Star Party at Kitt Peak.
Sat., March 20 - Messier Marathon at Arizona City Site

COVER: This amazing sequence was taken by the spacecraft Galileo last June 11 as it approached the asteroid Gaspra. Because the high-gain antenna is still unfurled, the data was only recently transmitted to earth as Galileo passed us for its final gravitational boost. The sequence shows Gaspra rotating as Galileo closed in. The highest resolution photo is shown on the back cover. Realize there is significant loss in the scanning and halftone process. The original resolution was 54 meters per pixel. Gaspra is an irregular body with dimensions 19 x 12 x 11 kilometers. The photos are courtesy of the Jet Propulsion Laboratory via Mike Belton of AURA.

TAAA EXECUTIVE

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MEMBERSHIP IN THE TAAA

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

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

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

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

Desert Skies Publishing Guidelines

* All articles, announcements, news, etc. must be submitted by the **15th 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:
TAAA - Desert Skies
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. a) Decide if you want Sky & Telescope, then add $20 to your membership rate.
   b) Include Sky & Telescope's renewal notice, if possible.
3. Write one check, payable to TAAA.
4. Send it to TAAA, P.O. Box 41254, Tucson, AZ 85717.

Call the Treasurer if you have any problems.

March Featured Speaker: David Levy
"The Art of Comet Hunting"

Anyone who is not a newcomer to astronomy knows something about David Levy. He may be the author of the book you just bought, or the column you read in last month's Sky and Telescope that you enjoyed. Didn't he discover a comet last year?

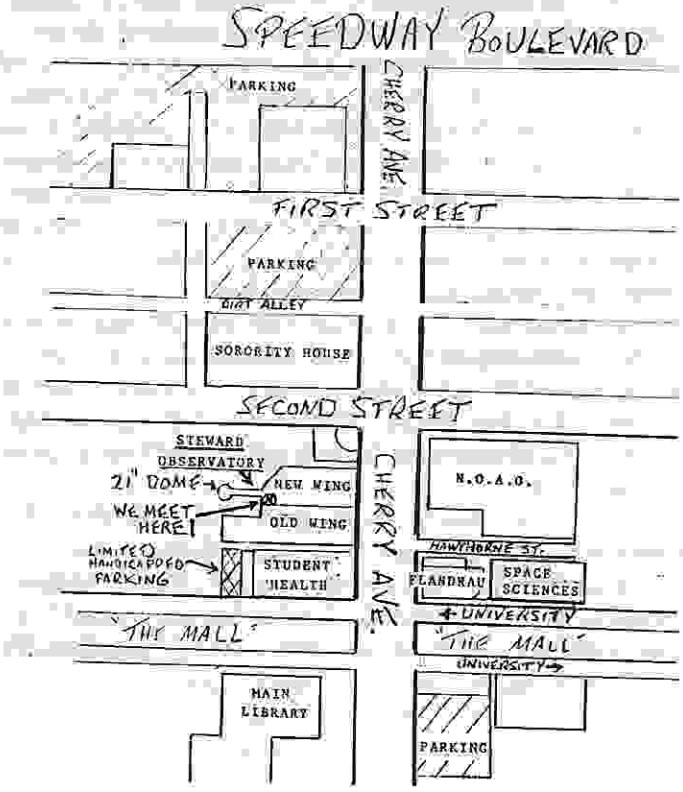
Well, being from Tucson, we are lucky that we know the flesh and blood David. The one who grew up in Montreal, Canada, but moved to Tucson 12 years ago where the clear skies were. The David who, if you called an active observer would be a gross understatement. The David to whom a great debt is owed by the standard bearers of our hobby - the Astronomical League, The Association of Lunar and Planetary Observers and the American Association of Variable Star Observers for the contribution of his time, effort and observations. The David who makes school appearances to get a new generation of youngsters excited about the sky. The one who writes books and columns and talks at conferences to educate and inspire us to do more. Yes, he has discovered a comet or two - in reality, he is up to 17! Actually, as I write this, he is at Palomar, perhaps I may have to edit that number.

But while David lives and breathes astronomy, he is just about the nicest person I know, and I encourage you all to come and meet, not only the legend, but the flesh and blood David too. -DK

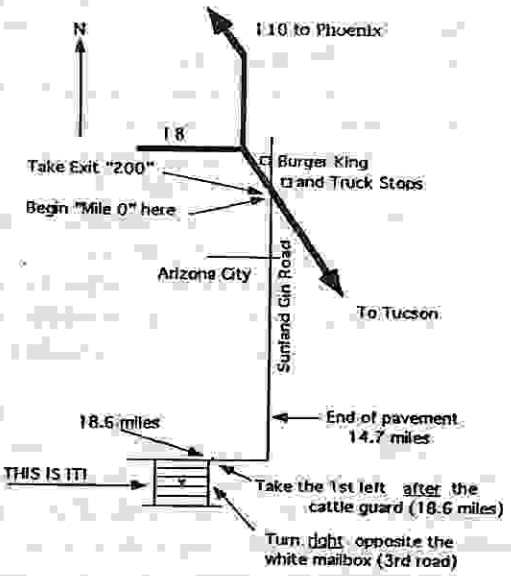
BEGINNER'S LECTURE -- Friday, March 5th, 6:45 PM
GETTING STARTED WITH OPEN STAR CLUSTERS

What is an open star cluster? Why do stars exist in groups? How far away are these groups of stars? How old are they? Since Galileo positively identified the Praesepe in Cancer as "not one star only, but a mass of more than forty small stars," these questions have occupied generations of astronomers. Their answers have provided insight into the nature and structure of our own Milky Way galaxy.

March is a good month for observing OPEN CLUSTERS, and this lecture will be well suited for anyone who wants to observe them. After the Sun, Moon, and planets, OCs are probably the next easiest object to find and a fine way to learn the constellations and starhopping techniques. Many are best viewed with 35mm or 50mm aperture binoculars; some are viewed well with the unaided eye! This talk will give hints on finding and observing deep sky wonders, and about two dozen or so clusters visible in the Winter and Spring sky will be presented. Almost all clusters are resolved with binoculars or a 60mm refractor. The talk will be supplemented with slides and photos taken by club members. If you consider yourself a solar, lunar, or planetary observer, or if you have little experience with your new telescope (or binoculars), this is the place to pick up some hints of observing these charming deep sky objects. See you at 6:45 PM on Friday, March 5 – 45 minutes before the start of the regular meeting. (Note: You're right. This is 15 minutes earlier than previous months.)



TAAA MEETING SITE



ARIZONA CITY
MESSIER MARATHON SITE

Upcoming Events

Kitt Peak Picnic and Star Party!

When: 13 March, 1993 4pm - 1am
Where: KPNO Picnic Area
Conditions: Limit of 30 people no fires or headlights after dark

With the interest shown at the last meeting, we sought and received permission to hold yet another picnic and star party at Kitt Peak's public picnic area. As mentioned above, the basic rules will remain the same as before. There are no prearranged tours of the Observatory, but you may take part in the public guided tours, which take place at 11am, 1pm, and 2:30pm. The mountaintop closes to the public (and us) at 4pm, at which time, we will move down to the picnic area for a cookout and observing once it gets dark. If you come later for the cookout and observing only, be sure to arrive early enough so that you do not need to use your headlights. The Club will provide charcoal, bring a dish to share and whatever else you want to cook. Please be aware that as we will be on an Indian reservation, alcoholic drinks are forbidden. Cooking fires and lights out at twilight, to minimize impact on the observatories nearby. Moonrise is at 12:40am, and we are to be out of the area by 1am. Use parking lights only to find your way back to the mountain road (a couple hundred yards).

Because much of the interest in this event came from our winter visitor members, they will receive priority this time. We will try to schedule another one later in the Spring. Identification cards must be displayed on all cars, and they will be handed out at the March meeting as people sign up.

One of the reasons we obtained permission so easily, is because a large percentage of KPNO's volunteer staff are TAAA Clubmembers, and both sides benefit by having events like this. Think about volunteering, be on our best behavior for this event, and we can continue to have these on a regular basis. For questions call Dean 293-2855.

Competitive Observing Makes an Appearance in Arizona!

What: 1993 Messier Marathon
When: 20/21 March, 1993
Who: Phoenix and Tucson Clubs
Where: Arizona City Deep Sky Site (see map elsewhere)

Quoting from Saguaro Astronomy Club's Deep Sky Chairman A.J. Crayon, "The Messier Marathon is designed to encourage Deep Sky observing. By joining in with other marathoners you will enjoy companionship of those also involved. It will test your observing skills. If you are a club member in good standing then join in and do so just for the FUN OF IT."

"Your involvement will not go unnoticed as there will be awards in recognition of effort. People observing 50 or more objects will receive an 8 1/2 x 11 certificate. For first, second and third place there will be plaques suitable for mounting on a telescope. Duplicate awards will be made for ties."

"If you plan on participating in the Marathon then doing some homework ahead of time will pay dividends. Study the list (supplied at next meeting - ed.) along with your star atlas to develop a process and become familiar with it. Be prepared in case it becomes cloudy (yuk!) and the sequence has to be altered. Don't forget to observe companion objects such as the ones near the Andromeda Galaxy and Orion Nebula."

"In packing for your trip be sure to bring a supply of sharpened pencils. Pens may not do well in the cold night air. For comfort, come over prepared with warm clothing. for energy, a good supply of food and hot beverages will keep you working on attaining a high count of objects. While you're at it checking supplies, don't forget fresh batteries for red filtered flash lights"

The event will be held at the site where the TAAA held last Fall's ill-fated All Arizona Star Party (weather looked bad from town, and no one came out, but actually, conditions at the site were great). The sky is dark and the site is the same driving distance from Phoenix and Tucson (about 80 miles). I encourage you all to make the effort, observe massive quantities of objects and make some friends from the Phoenix groups at the same time.

At the March meeting, I will have the official observing forms, suggested order of observation, and hints from observer extraordinaire Tom Polakis in bagging those important objects during twilight for a successful marathon. For questions, call Dean 293-2855.

Camera Show Coming to Town

For those of you not in the know, the twice-a-year camera show is taking place on March 6 and 7, 1993. It all happens at the Shriner's Temple, on Tucson, just south of Broadway. It is a great place to get a new lens for the camera, pick up a spare camera body, or get that hard to find item, whether it is a new case for your 1933 Leica or your 1972 instamatic - they pretty have at least one of everything! There have even been a few telescopes there, and certainly some fast lenses suitable for astrophotography. Prices are usually reasonable, as well as negotiable. This is the first time in recent memory they will spread it over two days, but most of the bargains happen in the first and last hour, so see you there at 10am Saturday or 4pm Sunday!

"STARSPOTS"

Of Feeble Stars and Opaque Clouds

The intrinsically faintest star yet discovered is the infrared dwarf LHS 2924. This star is over 1 million (10^6) times fainter than our own Sun, and if placed where the Sun is, would appear no brighter than a gibbous moon (mag -11.6). LHS 2924 has an apparent visual magnitude of +19.7, an absolute visual magnitude of +20.0, and a bolometric magnitude of +13.9. LHS 2924 is at a distance of 28 light years, and has a surface temperature of only 1,950K (3,050°F). This star radiates over 98% of its energy in the infrared portion of the spectrum (only 1.2% as visible light), and it has a mass well under 0.08 solar masses. Hence the term **Infrared dwarf**. LHS 2924 is both the coolest and least luminous star known. Unlike the Sun, its peak radiance occurs in the infrared rather than the visual, at a wavelength of 15000Å (1.5μ). LHS 2924 is so small and cool that it is thought to shine from gravitational contraction rather than the fusion of hydrogen into helium, as occurs in our Sun.

Do even fainter stars exist? Is there a smooth transition between stars and planets, or does an abrupt void exist between the two classes of objects? To answer these questions, we are going to have to mount a thorough search for incredibly faint stars which have large parallaxes and proper motion (thereby eliminating all distant stars of "normal" luminosity). These "infraluminous" objects will be pouring out much of their feeble energies in the red and infrared regions of the electromagnetic spectrum, so space-based telescopes will have a decided advantage in the search for the very faintest stars.

Not only will the least luminous stars be very red (very infrared?), but even the nearest of them will be incredibly faint. Here again, space-based (and eventually moon-based) telescopes can best lead the way. The Hubble Space Telescope, is able to image stars as faint as 28th magnitude - over four magnitudes fainter than any ground-based telescope can see - and with much greater clarity. But won't searching for infraluminous stars be an almost hopeless talk, considering the sheer numbers of stars we would have to pick through? Yes, unless we select our regions of study judiciously.

Scattered throughout the galaxy are numerous clouds of dust (mostly silicate grains 0.001 to 0.00001 mm across)and gas (mostly hydrogen and helium). Some of the dust clouds are thick enough that they block out nearly all the light coming from stars behind them. The most extreme example of this is a particularly dense cloud near the star Rho Ophiuchi with up to 106 magnitudes (!) of absorption at visual wavelengths. This highly opaque dust cloud is located at about $\alpha_{2000}=16^h38^m$ and $\delta_{2000}=-24°\ 06'$ at a distance of some 650 light years from our solar system. Dust clouds like this - especially if they are nearby - would provide excellent backdrops upon which to search for nearby infraluminous stars. The light of all stars more distant than the cloud would undergo severe extinction due to absorption and scattering within the cloud, while stars nearer than the cloud would, of course, be unaffected. Certainly it is true that stars within the cloud or behind it and intrinsically very bright would still be visible to us. Another complicating factor is that these interstellar dust clouds become less opaque in the deep red and infrared - the regions we are most interested in. but even taking all this into account, the percentage of nearby, low-luminosity stars in the star field being studied will be far greater than in an unobscured region of sky.

- David Oesper

Editor's note - David, president of the Ames (Iowa) Area Amateur Astronomers, has been writing "STARSPOTS" in the AAAA newsletter for many years. His columns are well written, often intriguing and always informative, and will be regularly included in Desert Skies as space allows.

Join Us for the Third Annual

Grand Canyon Star Party

The Tucson Amateur Astronomy Association (TAAA), in conjuction with the National Park Service, announces the third annual Grand Canyon Star Party, to be held **June 12 - 19, 1992.** It is the perfect spot for such an event - spectacular scenery by day and wonderfully dark sky by night. Geared towards showing the sky to the visiting novice, many of which have never been under a dark sky before, the excitement, joy and gratitude expressed by the mostly international crowd is very satisfying. And when the hour grows late and the crowds thin, you are left to explore the limits of your telescope in some of the darkest skies in the United States. We guarantee you will make lots of friends and retain a multitude of pleasant memories with which to return home.

Location and Ground Rules:

We will be setting up on the South Rim in a clearing near the Yavapai Museum. The observing area, though near the Yavapai parking lot, will be behind a locked gate during the day and you will be allowed to leave your telescopes set up during your stay. We are also looking for volunteers to give twilight talks to entertain visitors between sunset and when viewing starts. Please indicate if you would like to do this. Although we are not charging for registration, to monitor attendance, and provide proper paperwook if you are bringing a telescope, we are requiring a cursory registration with the approximate dates of your stay and where you will be staying while at the Canyon.

Where to Stay:

Housing is critical at this time of the year. There are no special arrangements available for Star Party attendees, except for a few provided campsites, for which we will take names starting on March 1. They will go fast!

Rooms, RV's, &Trailers: If you want a room near the South Rim, make your plans and reservations now! It is never too early to book a room in the summer at the Grand Canyon. If there are none available, you might make alternate plans (ie., campground reservations) and try to pick up a cancellation when you get there. All lodging and motels release no-show's rooms at about 4pm, and since many tour groups overbook, there may be rooms available. For reservations at any of the motels or lodges at the South Rim or for Trailer Village (camping trailers or RV's) call Fred Harvey Inc at (602) 638-2401 **as soon as you make your plans!** Expect long telephone waits while making your reservations.

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

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

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

Proceedure:

If you plan to bring a telescope, please register by sending a long self-addressed stamped envelope to TAAA - Grand Canyon, 1122 E. Greenlee Pl. Tucson, AZ 85719. For questions, please call (602) 293-2855 between 8 and 10pm MST. Come for one night or for all eight, but be prepared for a lack of sleep, with the Canyon calling for you by day, and the wonderful skies by night!

JUPITER; King of the Planets

Near the end of this month on March 29th Jupiter comes to opposition, rising at sunset and is conveniently placed all night for observation in a telescope. Jupiter this year appears among the stars of Virgo with Spica the brightest star in the constellation.

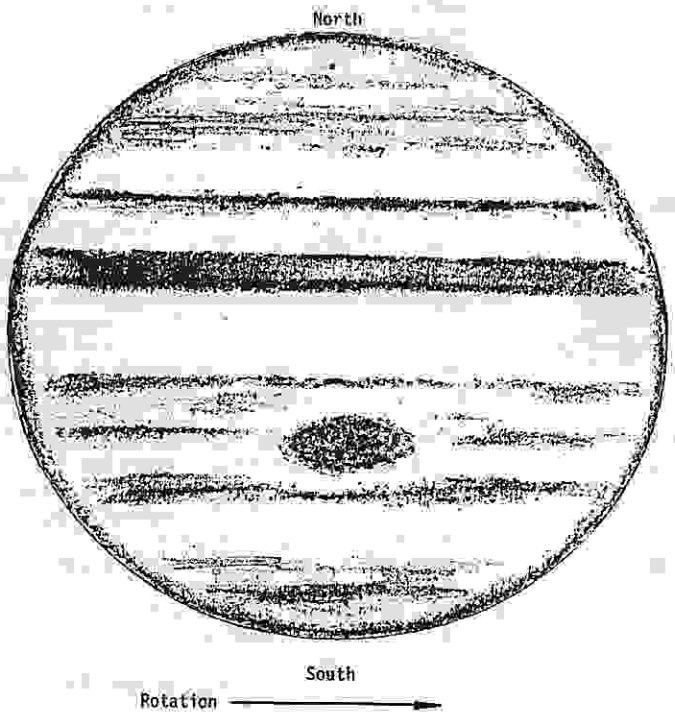
Jupiter is the largest planet in the Solar System, having a diameter of 89,000 miles at the equator, it would take about 1347 Earths to fill up Jupiter's volume, but it is only 318 times more massive than the Earth. Jupiter is the fifth furthest planet from the Sun, orbiting at about 484 million miles. It completes an orbit around the Sun (a Jovian year) in a little less than 12 Earth years and comes to opposition every 13 Earth months. Jupiter rotates on its axis in 9 hours, 50 minutes at the equator, and at the poles, its about 6 minutes more. Due to Jupiter's rapid rotation, it appears oblate in shape - its equatorial diameter 89,000 miles versus a polar diameter of 80,000 miles. 90% of Jupiter consists of hydrogen, followed by helium 4.5%, and smaller amounts of methane, ammonia, and other gases. Jupiter is thought to have a small rocky core surrounded by an ocean of liquid metallic hydrogen and then a shell of liquid molecular hydrogen with an outer atmosphere of hydrogen and helium.

To a telescopic observer, Jupiter is an excellent target for observation, because it is large - usually 30 arc seconds at conjunction and about 50 arc seconds at opposition. Jupiter is also bright - at opposition usually about -2.5, and its features and moons are in a constant state of change. When observing with 2.4 and 3 inch telescopes, use 100x-150x. First you will notice that it is oblate and crossed with parallel dark belts and lighter zones, and that it has 4 moons. In a 4 inch and larger telescopes, you can watch as a moon transits, that it casts a shadow onto Jupiter's disc. With 6 inch and larger telescopes, use 150x-250x to bring out more details within the belts and zones, and also some of the subtle colors - oranges, browns, tans and grays. The lighter zones are ammonia clouds which appear higher in Jupiter's atmosphere than the darker belts, which consist of a mixture of methane, ammonia, and sulfur.

Jupiter is probably most noted for its Great Red Spot which gives Jupiter the appearance of a one-eyed Cyclops. The famous Spot does not always appear red, but it changes constantly in hue from deep red to salmon to a pale cream. The Great Red Spot appears to be some kind of huge high pressure system, its surface area equal to Earth's. It is not known if the Great Red Spot is a permanent feature, or if it might not disappear at some future time.

Jupiter has 4 bright moons visible in small telescopes also known as the "Galilean Satellites", first discovered by Galileo Galilei in 1610 with his telescope. Their names are Io, Europa, Ganymede, and Callisto. The first two are slightly smaller than Earth's moon and the last two are a little larger. Io takes 1.75 days to orbit Jupiter, Europa 3.5 days, Ganymede 7 days, and Callisto 16.5 days. Observing them in a small telescope makes an exciting evening project. Note their positions every hour as they shuffle back and forth around Jupiter. So for the next few months why not set up your telescope and observe the ever changing King of the Planets?

- Jeff Brydges



JUPITER$; Belts & Zones

(NPR) North Polar Region

(NTZ) North Temperate Zone

(NTB) North Temperate Belt

(NTrZ) North Tropical Zone

(NEB) North Equatorial Belt

(EZ) Equatorial Zone

(SEB) South Equatorial Belt

(GRS) Great Red Spot

(STrZ) South Tropical Zone

(STB) South Temperate Belt

(STZ) South Temperate Zone

(SPR) South Polar Region

OBSERVER'S REPORT

This article marks the return of the Observer's Report to the newsletter. I want to thank the TAAA executive for giving me the opportunity to take on some of the responsibilities of the Chief Observer. I also want to thank Eric Karkoshka, Jeff Brydges and Rik Hill for contributing to the Chief Observer's duties in the past few months. Their assistance is aprreciated! Both Eric and Jeff will continue to contribute at meetings or in the newsletter in the months to come. Finally, Andy Meyer deserves thanks for the enthusiasm and effort he brought to the Chief Observer position. I hope I can continue to bring these qualities to the position.

By the time you read this the clouds may have parted long enough for at least some deep sky viewing during at least the latter half of February. The persistent cloudiness plaguing us throughout the winter months have robbed us of some good views of the winter sky, but March may yet permit both the sun and deep sky objects to be seen once again. As for myself, the last real dark sky observing I had was at the Smithsonian Base Camp in January. It was at this event that I was re-introduced by Bruce Walsh to a neat nebula dubbed "The Pac-Man Nebula", NGC 281. This object was plainly visible with direct vision with Bruce's 14.5" Dobsonian, a 32mm wide field ocular and a UHC filter. It was less obvious but also directly visible in my 10" Dob, a 24mm ocular and a UHC. What makes this object rewarding is not only that it is moderately bright and easily found, but also that the shape of "Pac Man" (and especially his mouth) can be easily discerned (with minimal imagination). If you've never played Pac-Man or don't know what he looks like then the following diagram may be of some assistance.

Compare this drawing to the photo on page 525 of Burnham's Celestial Handbook. Although listed in this handbook as a diffuse and not a dark nebula, it appears from this photograph that dark nebulosity defines the "mouth" of the nebula. To find NGC 281 scan with low power about just 1.5° east of Alpha Cass. It's best seen with at least an eight inch reflector, a UHC filter and a low power ocular. If anyone observes this object, please tell me what you see!

Another interesting object in Cassiopeia soon to be lost from view (but still over 20° up in the northwestern sky at end of twilight in March) is the Owl or "ET" Cluster, NGC 457. Look for this open cluster about 4° southeast of Gamma Cass. with a low power ocular yielding around 50x. You'll see two starry "eyes", one 5th magnitude (named Phi) and the other 7th. Robert Burnham writes that if Phi is actually a member of this cluster then it "must be one of the most luminous of all known stars, exceeding even Rigel." (Page 530) In addition to the eyes look for two outstretched arms (or wings if you prefer). Because of the striking appearance of the cluster it's always a hit at public star parties.

Although globular clusters are sparse in the winter sky, NGC 1851 can be seen south of the constellation Columba, the dove, 13° above the southern horizon at end of evening twilight in mid-March. Although listed at magnitude 7.3 (brighter than nearby 8th magnitude M79), NGC 1851 appears dimmer and smaller than it's near cousin due to its low altitude as seen from Arizona.

The first good weekend to get in some dark time for deep sky observing is the weekend of Friday and Saturday, March 12-13. The waning gibbous moon (just one day before last quarter on the 13th) does not rise until 11:46 p.m. on the 12th and 12:46 a. m. on the 13th, allowing a minimum of three and three quarter hours of dark time (Times are from the planetarium program for the Macintosh, *Voyager*). I hope to view some of these objects with you when the weather finally decides to cooperate. Clear skies!

Michael Terenzoni

Desert Skies Classified

Wanted - your slides or photos of open star clusters to show at March's beginner's lecture. Call Rob at 745-0710.

Wanted: Brackets to hold 6X30 finder; FOR SALE: Small diagonal for Newtonian telescope; 20th wave, 7/8" minor axis, custom made; OR WILL TRADE FOR 1 1/4" diameter eyepiece with 16-18mm focal length. Call Gilbert Friedman at 571-1662

For Sale: Extensive collection of Sky & Telescope; complete from 1960 to 1988 except for five issues. Also most of '89, '90, and '91 plus several issues from the '50s. A total of 379 issues for $150. Call Ron Price at 577-1056.

For Sale: Dobson-type mounting for 12.5" telescope. Nearly new, $175. Werner Scharlach 795-9350.

For additions or changes to this list call Dean, 293-2855.

Not Available

Due to illness, the Dark Skies and Calendar are not in this month's newsletter. Look for it next month.

Upcoming National Meetings

Information for Texas Star Party (about May 16th-23rd, Texas), Riverside Telescope Makers Conference (Memorial Weekend, California), and the Astronomical League Conference (July 29-31, Wisconsin) will be available at the next meeting.

Executive Meeting Minutes - 11 February, 1993

Meeting convened at 7:40, attending were D. Nye, T. Hunter, B. Becker, G. Rosenbaum, T. Lappin, D. Niehaus, and D. Ketelsen.

1. **22" Telescope** - The TAAA now owns a 22" telescope that was built and donated to us by Green Valley resident Marvin Vann. Frank Lopez, who runs Stellarvision, had been dealing with Vann for the scope, and is still interested in acquiring it. Frank was scheduled to attend, but he did not come. It was generally thought, that since we have a functional 16", a 30" under construction, and are looking at a donation of some telescopes from Prescott, we could probably dispense with a 22" of unknown quality with a rudimentary equatorial mount. We will try to meet with Frank to arrange a cash offer or exchange for merchandise.
2. **Land Considerations** - The 20 acre site under consideration by the Executive has been sold. There is a 2 acre site across the road that has just become available. Someone was going to check it out. There was a discussion of whether or not we should be looking so hard for land with relatively little in the bank. It was decided to push the fund raising a little, and see what the TAAA could raise internally - see Treasurer's report below.
3. **Member Phone Survey** - 39 surveys were filled out and returned at the February general meeting. With 180 members, that represents less than 25% return. Membership lists were distributed and we will attempt to get more filled out via phone interview. Of the partial results, there was overwhelming support for obtaining land for development of a TAAA observatory. Something like 40% were willing to make one time donations or regular contributions to a land fund. A somewhat greater amount was willing to rent pads to help cover costs for expenses. A complete analysis will be done when more surveys are in.
4. **Upcoming Events** - Upcoming events were discussed for any last minute changes that might have occurred.
5. **Newsletter Meeting** - The February newsletter meeting, like the January one, will be at the Mirror Lab on February 20.
6. **Pat Daniels** - Pat won the TAAA t-shirt contest held nearly a year ago. Pat had inquired about the results and whether the prizes would be awarded, as his membership was expiring (first prize was a year's free membership and a $40 gift certificate from Stellarvision). His membership was extended, and Dean was going to talk to Frank about the gift certificate. Sharon Niehaus had looked into t-shirt production. The initial findings was that with the number of colors required to accurately reproduce the artwork made the shirts prohibitively expensive. We need to discuss the matter with Sharon further.
7. **Treasurer's Report** - The land fund is approaching $14,000, the total treasury is just under $18,000. Brad Becker had investigated the automatic deduction procedure from Valley National to help raise funds for obtaining land. TAAA needs a voided check, and the member's signature to start. VNB will charge $10 plus $.06 per transaction. If 20 members each donate $10 per month, TAAA will get $188.80 and VNB will retain $11.20. We will have a form in the next newsletter and available at meetings to have members take advantage of this easy method of donation. Brad has agreed to head this aspect of fundraising and will be available for questions at the March meeting.
8. **Mirror Making Class at Flandrau** - Flandrau has agreed to devote basement space to TAAA's mirror making class. The room should be available in mid-March, which fits into the schedule of Ellen Fultz in donating her father's shop to us and sell her house there in Prescott. We are looking at the major move of equipment the week of 13-20 March (Ellen's spring break). Some Executive may go up 27 February to better survey the situation.
9. **New Member's Packet** - Gary Rosenbaum presented a list of pamphlets available from Sky and Telescope and Astronomy that would be a good introductory source of materials for new members who are new to astronomy. It was decided to spend the money (which would run less than $2 per new member) to upgrade the packet.
10. **Astronomy Day Activities** - Astronomy Day is May 1, 1993. TAAA is negotiating with Tucson Mall to have displays and activities there. Teresa has been involved with them and had concerns that the liability insurance renewal did not cover the club in the same way. She was going to call the insurance agent to straighten it out. Tucson Mall requires liability insurance and also requires that they be named in the policy.
11. **Astronomical League News** - Derald Nye had received amendments to the bylaws approved at last summer's meeting. Derald had reviewed them and recommended approval. The Executive voted to approve the amendments.
12. **Other Business** - It was pointed out that Elections were coming up in May and we should get some members interested in the business side of the club and run for Executive positions. In addition, as we have not had a quorum in recent memory, we need Executive members who will come to meetings and participate. Dean will announce the election at the next general meeting.

KITT PEAK DOCENT PROGRAM

KITT PEAK MUSEUM IS ACTIVELY SEEKING DOCENT GUIDES TO CONDUCT TOURS OF KITT PEAK NATIONAL OBSERVATORY FACILITIES. PRIOR KNOWLEGE OF ASTRONOMY IS NOT NECESSARY. IF YOU HAVE A STRONG WILLINGNESS TO LEARN, AND AN INTEREST IN PROMOTING PUBLIC AWARENESS AND SCIENCE EDUCATION, CONTACT DAVE BEDELL, VOLUNTEER PROGRAM COORDINATOR, AT (602) 322-3425. TRANSPORTATION AND MEALS ARE PROVIDED DURING VOLUNTEER HOURS AND A 15% DISCOUNT IS GIVEN IN THE MUSEUM STORE. IN ADDITION, VOLUNTEERS MAY ATTEND KITT PEAK PUBLIC EVENINGS FREE OF CHARGE.

Donating to TAAA has Never Been Easier!

The following form can be utilized to make a monthly donation to the Club's land fund simply and easily. We need a voided check (to verify account numbers and routing info) and this form filled out. As the Executive has pointed out in recent meetings and newsletters, if every clubmember gave $10 per month, after a year we would accumulate $11,000 and be well on our way to buying almost any spot we like. If you feel strongly about the Club having an observing area of its own and possibly developing a state of the art observatory, we urge you to spend a minute, fill out the form, and give a amall amount you can easily afford. It adds up fast and you can cancel at any time. Mail in the form with your voided check, or come to the March meeting to fill out the form in person. Brad Becker will be available to answer any questions you might have. Thank you for your support.

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

Please attach voided check

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

FINANCIAL INSTITUTION NAME _____

ACCOUNT NUMBER _____ BRANCH NAME _____

BRANCH ADDRESS _____ CITY _____ STATE ___ ZIP _____

MEMBER NAME _____ SOCIAL SECURITY NO. _____

MEMBER'S SIGNATURE _____ DATE _____

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

SKY PUBLISHING BOOK ORDER

Here's your chance
to order some good books
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Sky Publishing Corporation is changing their policy for book orders and this may be the last time we are able to order books at this very good discount price so get your order in now.

Sky Publishing, who brings us Sky & Telescope each month, also makes astronomy books available at a discount to TAAA members. Their 1993 catalog of products will be at the next meeting, so look through it and order something. Payment is needed in advance. If you know the book you want and can't make to the meeting, call Teresa at 579-0185 to place an order. Otherwise, talk to Teresa at the next meeting. The deadline for placing an order for this shipment is March 10th. The books will be brought to the April meeting for distribution.

Steward Observatory's

Public Evening Series

7:00pm - 10:00pm, Room N210

Here is the Steward Observatory's Public Evening lecture series schedule. Formerly Eyes on the Universe and run by Flandrau Planetarium, it is now run by Steward Observatory. Before Flandrau existed, Steward ran the series for many years, so actually the lecture series has returned to its original format. The lectures are held in the same lecture room that the TAAA currently uses for its regular meetings. There is no charge or tickets necessary...just show up.

March 1	M.F. McCarthy, S.J.	Searching for Rainbows in Roma: How Angelo Secchi Discovered the Carbon Stars
March 30	G.H. Rieke	The Story of the Seven Brown Dwarfs---Not a Fairy Tale!
April 12	C.D. Impey	Life in the Universe
April 26	E.T. Young	An Infrared Look at Star Formation
May 10	P.A. Strittmatter	The Steward Observatory: Now and In the Future

TUCSON AMATEUR ASTRONOMY ASSOCIATION
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TUCSON, AZ 85717

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