

EPHEMERIS

Vol. 2 No. 4

Official Publication of the San Jose Astronomical Association

APRIL 1990

FIELD OF VIEW

- JOHN GLEASON

Our speaker April 7th will be none other than Kevin Medlock. Kevin will report on his progress with the electronic CCD imaging camera. Although nowhere near photographic resolution, Kevin's unit presents remarkable image quality in exposures of only minutes. If he has time, Kevin will also discuss Group 70's progress with the 48-inch Schmidt camera project.

Other events this month include a public star party April 6th at Branham lane park, (weather permitting), monthly board meeting on April 14th, followed by the introductory astronomy class at

weekend provides six hours of full darkness under the peerless sky of Glacier Point. Both the Friday and Saturday star parties are being publicized in the park's newspaper, but there are enough SJAAers to cover both, even if you can't come until Saturday.

Sign-ups are now being taken by Jim Van Nuland, 408-371-1307, 10 am to 11 pm, or by mail to 3609 calico Ave., San Jose, CA 95124. PLEASE, if your plans go awry and

ASTRONOMICAL AUCTION

Enclosed this month you will find your pre-registration form for the upcoming auction. Please read the details carefully. The

10th Annual Astronomical Auction will be held on May 5th at the

8:00 p.m. There is a scheduled star party on April 21st at Henry Coe dusk till dawn. I also understand that there is a public star party at Grant Ranch park the same evening conducted by the Halls Valley Group. Don't forget that the SJAA will be conducting the annual Astronomy Day celebration at Branham Lane Park the evening of the 28th. There will be an afternoon (solar observing) and evening session. Please give Jim Van Nuland a call for further details.

YOSEMITE STAR PARTY

The annual SJAA/Yosemite star party will be the weekend of July 20th & 21st. This moonless

you can't go, call Jim. Free camping is guaranteed only for the first 30 persons (not parties), but there is no limit to how many may go. If the horse camp is available (we know only at the last moment), then all will have free camping.

ASTRONOMY DAY

April 28 is National Astronomy Day, intended to publicize astronomy and telescope making. The Astronomical Association of Northern California provides regional publicity, to assist all clubs get the word out. We will be at Branham Lane Park during the afternoon and evening. The Fremont Peak Observatory Association is also planning a program that same night, featuring John Briggs as the evening's speaker, and the 30-inch reflector.

Red Cross building in Los Gatos. As was done last year, we will have a Flea Market or Swap Meet during the afternoon from 2:00 to 5:00. Silent-bid sales may be conducted, too. Then from 6:00 until we finish, material will be auctioned. The building will be open by 1:00 pm. Come early, stay late.

Items having a (realistic) minimum bid of \$5 or less probably should be offered during the flea market, rather than the auction. Very specialized items, even if valued above \$5, should also be sold at the flea market, as auction time is limited. A silent bid sale could be used.

Items of general interest should be entered in the auction. The \$5 minimum is a guideline, but if the item is of wide interest, it could be auctioned. Pre-registration is urged!

As before, SJAA's sales commission will be 10%, and a donation of \$1 is requested when registering to buy or sell. Please remember that everything is subject to prior sale.

'Absolutely mind-boggling,' say shocked scientists
HUMAN SKELETON FOUND ON MOON

BRANHAM LANE STAR PARTIES WE WANT YOU!

Don't forget that the SJAA is holding public star parties on the following Fridays. Here are the upcoming dates: April 6, May 4, June 1, June 29, July 27, August 31, September 28, October 26, December 28. Bring a telescope and tell your friends. For more information please contact Tom Ahl or Jim Van Nuland. Their telephone numbers are listed elsewhere in this issue.

MARCH STARRY NIGHTS

- RICHARD STANTON

As the blessing of the Blarney Stone was slowly quitting my system, there came a knock upon my door. There 'e was, small little green fellow wi' flaming red 'air. Thereupon 'e spun me his yarn about spending the last twenty years stand-

APRIL 7TH GENERAL MEETING KEVIN MEDLOCK CCD CAMERA TECHNIQUES

APRIL 1: (SUNDAY) DARKNESS SQUANDERING TIME BEGINS: ADVANCE YOUR SUNDIAL ONE HOUR AT 2:00 AM.

APRIL 6: (FRIDAY) PUBLIC STAR PARTY AT BRANHAM LANE PARK. SUNSET, 7:35 PM.

APRIL 7: GENERAL MEETING 8 PM. CCD CAMERA TECHNIQUES BY KEVIN MEDLOCK

APRIL 14: SJAA BOARD MEETING AT THE RED CROSS, 6:30 PM, FOLLOWED BY THE INTRODUCTORY OBSERVATIONAL ASTRONOMY CLASS AT 8:00 PM.

APRIL 21: SJAA STAR PARTY AT HENRY COE STATE PARK. DUSK TILL YAWN

APRIL 28: ASTRONOMY DAY. AFTERNOON AND EVENING SESSIONS AT BRANHAM LANE CITY PARK.

MAY 4: (FRIDAY) PUBLIC STAR PARTY AT BRANHAM LANE PARK.

MAY 5: SJAA/BAY AREA 10TH ANNUAL AUCTION. SEE NOTICE IN SIDE.

MAY 12: SJAA BOARD MEETING AT THE RED CROSS, 6:30 PM, FOLLOWED BY THE INTRODUCTORY ASTRONOMY CLASS AT 8:00 PM.

ing in the Quick Check line at the grocery store waiting to discover this evidence of the great Apollo 11 cover-up and turn it over to the proper authorities. Then he turned to leave and cast over his shoulder ... "I always wanted to meet the Great April Fool."

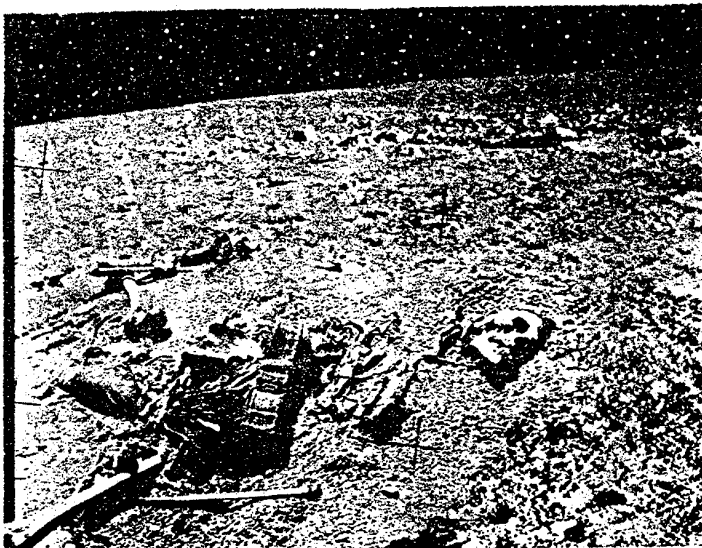
I have nothing against RFTs: Most of the binoculars I regularly recommend have 7mm exit pupils. But a larger-aperture RFT is often rather expensive: Mirrors and lenses much bigger than binocular size usually have longer focal ratios than binocular objectives, thus the eyepieces needed for RFT magnifications have

longer focal lengths - 35mm and up. If their fields of view are not to be unduly restricted, they must have front lenses large enough to require two-inch barrels. Such eyepieces are not cheap.

However, a Newtonian telescope with an f/5 objective of four or six inch aperture, with a 1.25-inch focuser, is a very useful instrument. It is lightweight and not too expensive, and with magnifications up to 50 diameters it does not require a mounting. In the late 1970's I built a six-inch reflector along these

lines, and used it quite happily as my main instrument for a year or more. With a 20mm Erfle eyepiece (giving 36X), I never needed a mount. Setup time was a few seconds - just take it out of the car and remove the dust covers. I added lock nuts to the secondary holder and "push" screws to the mirror cell, and in consequence I only had to recollimate it when I had removed the optics for cleaning or for some other purpose. The instrument's high portability was a considerable asset at many of our regular observing sites. I could arrive late at Fremont Peak on a prime night, when there was no more parking in the areas with a good view of the sky, take the telescope in hand and walk in. Or, I could carry it with me while moving around from place to place, socializing as I observed. I made the primary for mine and assembled the tube from commercial components, but similar finished instruments are occasionally advertised. (The Edmund Astro-Scan is one of these, though I think it is too expensive.)

As you may imagine, there is a certain knack to finding objects in a 36X telescope with no mounting and no finder. Most of the skill consists in not trying to hold the instrument entirely in your arms. I was always careful to



Astonishing photo blows lid off government cover-up!

THE CELESTIAL TOURIST SPEAKS

- JAY REYNOLDS FREEMAN

Recently I got to do my talk on binocular astronomy for the SJAA's introductory astronomy class. Binoculars are a fine instrument for beginners, and have given me some of my pleasanter observing experiences, but there is another class of instrument that many observers might find particularly useful; namely, low-powered unmounted telescopes of somewhat larger size. Let me be a little more precise as to what I mean.

I carefully did not say "rich-field telescopes" (also known as "RFT's"); which are instruments of any size (most often three to eight inch aperture) with magnifications selected so that the diameter of the beam of light coming out of the telescope - the so-called "exit pupil" - is seven millimeters. That is approximately the diameter of the dark-adapted pupil of the eye of a not-too-old adult: Any less magnification and some of the light gathered by the telescope will be wasted.

describe the six-inch as a hand-braced telescope, not a hand-held one. The tube length was such that when I placed the bottom of the tube on the ground, I could kneel or squat and find the eyepiece height convenient. Sometimes I would put the bottom of the tube on the hood of my car, or on a picnic table, and stand while I observed. It only took a little practice and thought about position, to hold the tube sufficiently steady for observing with such a low magnification.

But how do you find things? Well, that's another knack. I practiced finding stars bright enough to see with the naked eye, by craning my neck and sighting past the two knobs of the rack-and-pinion focuser. If the focuser had not been so constructed as to provide a natural sight, I would have installed a simple one - perhaps just a dowel supported a few inches away from the tube, parallel to the optical axis. A TelRad would be satisfactory, but I think overkill. I found that the kinesthetic memory of just how I had held my arm while supporting the telescope so that the object in question was lined up, would persist long enough for me to get my eye back to the eyepiece and look for it there. After all, the field of view of the 20mm Erfle was nearly two degrees in diameter. It's easier than it sounds.

With this instrument I logged many hundred of deep-sky objects between the completion of my Messier survey with 7X50 binoculars and the acquisition of my C-14. It gave me my first (and best) view of the Horsehead Nebula. I still bring it out occasionally. If I hadn't bought the big Celestron I would probably have built a simple Dobson mount for the six-inch; I might have anyway, but I instead built an eight-inch f/5 Dobson. I could do far worse than to recommend a telescope similar to this six-inch for an astronomer on a budget, slightly past the raw beginner stage, who is interested in deep-sky observation.

COLLIMATION, THE ETERNAL QUEST

- STEVE WALDEE

PART THREE - CATADIOPTIC CATATONIA, OR HOW I LEARNED HOW TO STOP COLLIMATING AND LOOK AT THE SKY

In previous installments, I used this medium as a kind of psychiatric confessional to describe how the grip of collimation gradually took hold of me. Working in a telescope store, I would frequently encounter hollow-eyed, shaky-handed customers, and recognized at once fellow collimators.

At last, I sunk to the depths of compulsion when I attempted to align a Schmidt-Cassegrain. But I'm proud to report that I've finally recovered my sanity, and have accepted the reality of earthly optical imperfection (and in addition, have also given away all my compact discs to return to good old scratchy LPs again!) For life is short, but collimation is eternal.

The catadioptric telescope has been frequently dismissed by Newtonian advocates as a fussy, complicated, and optically inferior design, whose larger central obstruction throws the energy from the central sharp peak of a star's image into the outer diffraction rings, dimming contrast and reducing resolution. But I'm now convinced that the bad-mouthing of catadioptrics is based on experience with improperly collimated telescopes with mushy, soft images.

I well recall that during the Mars opposition, the crispest planetary images I saw at the Branhams Park SJAA star parties included fantastic sights of Jupiter in Bob Fingerhut's 3.5" Questar at an astonishingly 100X magnification per inch of aperture, and of a richly-detailed Mars in Tom Ahl's orange C-8.

A brand-spanking-new Meade or Celestron Schmidt-Cassegrain is likely to perform beautifully at the highest power that the sky allows, but older instruments may give some disappointment. A lady who had no interest in astronomy whatsoever sold me an old, incomplete and defective orange C-8 for a hundred bucks, and my travails in cleaning the filthy corrector plate, fixing the tripod and drive motors, and adding all the missing accessories are sagas in themselves. But the initial efforts at repair and setup were inconsequential compared to my latter agonies as I undertook Perfect Cassegrain Collimation.

Not having actually used the old scope yet at night, I tried out the Tectron collimator set on the C-8, as the instruction booklet implied in a vague way that the best results would be achieved with the auto-collimation eyepiece. I performed the appropriate adjustments to the three little Allen-head screws on the secondary mirror, and anxiously repaired to a mountain top that evening for a presumably sublime summer view of Saturn.

What I spied instead was an ugly, smeared apparition, sans Cassini division, that had less detail and contrast than in my old 60mm telescope of youth.

A call to Tectron the next day yielded the information that most commercial SCT's are not necessary in collimation when the optical elements are aligned on the mechanical axis.

Unlike Newtonians, the SCT's more complex system and generally longer focal lengths are exceedingly difficult to collimate unless an actual stellar light source is used. A later trip to Celestron demonstrated to me just how the manufacturer achieves such good results: the corrector plate and mirrors are carefully matched and aligned with a laser collimator at 800-power in a special environmentally controlled clean room!

After numerous faltering trial and error steps, I finally achieved good collimation on my C-8 by following some of the suggestions in the previous installments, and adding steps appropriate to the SCT's unique design features.

I used an artificial star as described in Part 2 for my final image source. Again, I did not defocus the image until the diffraction disk lost all detail, but only slightly defocused until several concentric rings were visible (I chose the side of focus that gave the clearest and sharpest rings to begin with). Next, I took a fine-tipped felt marker and made a small dot on the top of each of the 3 adjustment screws at the 12 o'clock position, so that I would have a reference point, as well as a place to return to if I failed.

I was surprised at how the tiniest rotation of each screw would hugely affect the image. The circular rings would grossly distort, shift into a rough and choppy pattern, and even break up altogether. Gradually, with finer and finer adjustments, I achieved an absolutely centered and concentric image of circles, with a perfect pearly dot of light in the middle. But I was in for a big disappointment with the scope was tried out at night!

I had initially used an excessively high power that would never be employed in actual observing. As it turns out, the commercial SCT's perform focus adjustments by moving the primary mirror back and forth a large amount, nearly an inch of travel from the lowest to highest power. Furthermore, as the focusing screw turns, the mirror tilts a miniscule amount from side to side (which causes the slight image shift noticeable after you have carefully centered a planet or star in the high-powered eyepiece field).

If you collimate at a power you don't use for observing, then you are not absolutely perfectly collimated with the eyepiece you DO use! The difference is only slight, and may not be noticed by any but the most hand-wringing perfectionists. But I learned to collimate with my 7mm eyepiece, giving 285X that I consistently use for planetary and double-star observing, and that did the trick!

It's been a long, hard struggle. But at last I reached the ultimate plateau of wisdom. I can

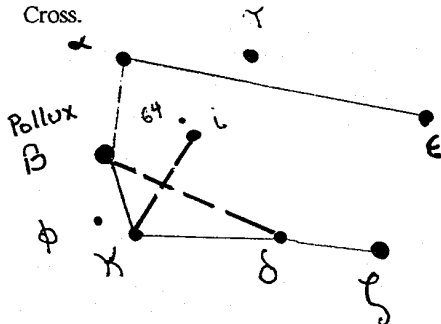
now impart to you the final, untold secret of telescope alignment: if you would observe the companion to the DogStar Sirius, the faint and elusive Pup, you have to achieve Perfect Collimation!

THE NORTHERN SOUTHERN CROSS

- PATRICK M. DONNELLY

Last year at this time I was doing field work in Phoenix, Arizona. Since I was away from home, most of my star gazing was done with the unaided eye. There I was standing on a hill looking south and watching Canopus a few degrees above the horizon. As I sat down my mind wandered south. I wished I was back in New Zealand under the Southern Cross watching Halley's Comet and Omega Centauri compete for my attention.

However, when I looked up overhead, I was startled to see the "Southern Cross". There it was right in the middle of Gemini. No it wasn't really the Southern Cross. It was a bit too big, and the stars were dimmer. However, the proportions were very close, and its size, surprisingly, was very close to the actual Southern Cross.



The "Northern Southern Cross" is made up of the stars Pollux, Kappa Gemini, Iota Gemini, and Delta Gemini. Pollux is the top of the cross and corresponds to the position of Gamma Crucis (Gacrux). Delta Gemini at magnitude 3.5 forms the base and is a poor substitute for the real thing. Even Phi Gemini is in about the same position as Mu Crucis. The only missing member is Lambda Crucis, but Kappa Gemini is a double, so just pretend.

GREAT RED SPOT

- JIM VAN NULAND

I have often stated that Henry Coe State Park tends to have clear skies, due to the ridges that separate it from the sea, keeping back the clouds; but that Coe seldom has especially good seeing (steadiness) because those same ridges destroy the laminar flow that is so conducive to

steady air. The February 24 star party gave the lie to both of those assumptions, as we had persistent haze, passing clouds, and seeing of 10 of 10!

The giant planet showed many belts, various spots and lumps, and of course, our favorite Great Red Spot! Looking more nearly "red" than since 1976, this Spot was seen at a glance, even by park visitors who had never looked through a telescope. The region of the missing SEB is still just a little darker than the zone south of it.

Good seeing and a power of about 200-300 are needed. Begin half an hour before the given time. Focus carefully, then scan the southeast quadrant of Jupiter. Watch carefully for those moments when the air is especially stable, and the Spot will show itself in all its glory. Let me know of your results, especially if you are using an instrument smaller than 8-inches, or if you try various filters.

COMET COMMENTS

- DON MACHHOLZ

No new comets have been discovered or recovered recently, in that respect this is a slow year for comets. But comets found last year remain visible, not the least of which is Comet Austin.

We now know that Comet Austin is a new comet to the inner solar system and that some of its early brightness was due to the more volatile chemicals burning off. So unless the comet disintegrates near perihelion (unlikely), I expect the comet to put on a good show; but it will not be bright enough to cast shadows! Since much of its brightness in May will be due to a

close passage to Earth (22 million miles), the comet can suffer much and still look good at the same time. The disadvantage of such distance is that the comet will appear large and you'll need dark skies to see it well. As with most comets, the view will be best with dark skies, trained eyes and high-contrast optical instruments.

For the ephemeris, I use an absolute magnitude of 6.0 and an "N" value of 4.0. I'm also listing the comet for every three days since it is moving rapidly. The comet will pass one degree SW of M 33 on the evening of April 12, and six degrees south of M 31 on April 24.

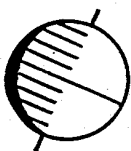
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achromat, A-R coated, Mfr. unknown. (1/16" chip on rear neg. lens, 1/2" from edge; \$800. Aluminized 3 3/8" f/12 A-R coated, spherical mirrors (meet Rayleigh's criterion); corner reflectors, flats, and smaller achromats. Large, huge, and humongous right angle prisms. Contact: Steve Greenberg, 415-423-4899 days, 209-239-2154 eves. 4/90

CELESTRON 8 w/starbright coatings, 8X50 finder, dew zapper, Motofocus, piggyback camera holder, multicoated diagonal, optical tube only one year old, Meade Tripod (more stable than Celestron's), Samsonite style case, \$1190. Also, Olympus binocular viewer with 2-pairs of eyepieces, \$350, lower price if purchased with telescope. Call after 7 pm, 209-463-1817 Edward Hillyer, 2305 De Ovan Ave. Stockton, CA 95204 4/90

C8 optical tube, case, 6x30 finder, starbright, good optics and collimation, new condition, \$400. 400mm f/6.3 telephoto lens, multicoated, t-thread system, rotating collar, 72mm filter adapter, \$175. Lumicon 72mm premium deep sky filter, \$150. 56mm Meade super Plossl, @ "O.D.", \$120. 40mm Konig II, 2" O.D. \$80. Lumicon adjustable piggyback mount for C-14 or other 16" O.D. tube (or larger), \$16. Orion 7mm and 9mm orthoscopes, multicoated, \$25 each. Televue 2" star diagonal with 1.25" adapter, \$105. Schmidt Cassegrain to 2" adapter, \$15. Meade 15mm and 9.7 mm super Plossl, 1.25", \$47 each. Orion dew zapper for 8", D.C. model, \$24. Jim Molinari, 8149 Park Villa Circle, Cupertino, CA 95014 (408) 298-7557 (W), (408) 255-7030 (H). 3/90

SUPER GIANT FINDERS - 100mm f/3.1 w/2" - 25mm Plossl, \$225. Also, 95mm f/4.8 w/2" - 40mm Plossl, \$200. Mike Schartman, (209) 544-8828 2/90

CELESTRON 22 ORIGINAL PARTS - 22" Hayward C3 full thickness mirror blank, cast aluminum mirror cell, tube, fork, polar housing, bearings, etc. Almost a kit telescope. \$3500 OBO. Gene Cisneros, (408) 923-6800 2/90

FOUND - Blue cord hat at Fremont Peak with UCSC Lick Observatory Patch. Contact Nick at (408) 462-4249 2/90

CELESTRON 11 with Starbright coatings and many accessories including CAT computer. \$3500 firm. Nick Doukas, (408) 462-4249 2/90

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COMET EPHEMERIS

Comet Austin (1989c₁)

DATE (UT)	RA (1950)	DEC	RA (2000)	DEC	ELONG	SKY	MAG
03-25	01h41.5m	+05°01'	01h44.1m	+05°16'	22°	E	4.1
03-28	01h44.3m	+08°45'	01h46.9m	+09°00'	21°	E	3.6
03-31	01h46.2m	+12°43'	01h48.9m	+12°58'	20°	E	3.0
04-03	01h46.8m	+16°51'	01h49.5m	+17°06'	19°	E	2.4
04-06	01h45.2m	+21°02'	01h48.0m	+21°17'	19°	E	1.9
04-09	01h40.9m	+25°04'	01h43.7m	+25°19'	20°	E	1.6
04-12	01h33.4m	+28°37'	01h36.2m	+28°52'	21°	E	1.4
04-15	01h23.1m	+31°28'	01h25.9m	+31°44'	22°	M	1.6
04-18	01h10.7m	+33°33'	01h13.5m	+33°49'	24°	M	1.8
04-21	00h57.1m	+34°56'	00h59.8m	+35°12'	27°	M	2.1
04-24	00h42.6m	+35°44'	00h45.3m	+36°00'	30°	M	2.7
04-27	00h27.5m	+36°02'	00h30.1m	+36°19'	33°	M	2.7
04-30	00h11.4m	+35°55'	00h14.0m	+36°12'	37°	M	2.9
05-03	23h54.1m	+35°24'	23h56.7m	+35°40'	42°	M	3.1
05-06	23h35.0m	+34°26'	23h37.5m	+34°42'	47°	M	3.2
05-09	23h13.2m	+32°55'	23h15.6m	+33°11'	53°	M	3.3

Comet Skorichenko-George (1989e₁)

03-25	01h19.0m	+42°19'	01h21.9m	+42°35'	44°	E	8.2
03-30	01h43.1m	+42°14'	01h46.1m	+42°29'	42°	E	8.2
04-04	02h06.8m	+41°55'	02h09.9m	+42°10'	41°	E	8.2
04-09	02h30.1m	+41°25'	02h33.2m	+41°38'	39°	E	8.2
04-14	02h52.5m	+40°42'	02h55.7m	+40°54'	37°	E	8.2
04-19	03h14.1m	+39°49'	03h17.4m	+40°00'	35°	E	8.3
04-24	03h34.7m	+38°47'	03h38.0m	+38°57'	33°	E	8.3
04-29	03h54.3m	+37°37'	03h57.6m	+37°46'	31°	E	8.4
05-04	04h12.8m	+36°21'	04h16.1m	+36°29'	29°	E	8.4
05-09	04h30.3m	+35°01'	04h33.6m	+35°07'	27°	E	8.5

JUPITER'S RED SPOT

Great Red Spot on Meridian PST

da	mo	d	h	m	da	mo	d	h	m	da	mo	d	h	m
Su	4	1	9	4 pm	F	4	13	9	8 pm	F	4	27	10	49 pm
Tu	4	3	10	50 pm	Su	4	15	10	51 pm	M	4	30	8	21 pm
F	4	6	0	22 am	W	4	18	8	14 pm	W	5	2	9	51 pm
F	4	6	8	14 pm	F	4	20	9	56 pm	M	5	7	9	1 pm
Su	4	8	9	54 pm	Su	4	22	11	36 pm	W	5	9	10	40 pm
Tu	4	10	11	32 pm	W	4	25	9	3 pm					

SPACE PROGRAM UPDATE

- BOB FINGERHUT

SPOT-2 EARTH RESOURCES SPACECRAFT LAUNCHED

The French satellite was launched on a European Ariane-4 booster on January 21. It has begun transmitting high-resolution panchromatic and multispectral images.

FUNDS FOR RETURNING TO THE MOON AND GOING TO MARS

The proposed budget of \$15.1 billion includes \$216 million for lunar base/mars technology. The goal is to return to the Moon by 2010 and go onto Mars by the mid-21st century. Also included in the budget request is: \$15 million for a Lunar Observer spacecraft to be launched into lunar polar orbit in 1996, \$235 million for Mission-to-Plane-Earth to set up a system of Earth observation platforms, \$25 million for specialized Earth probes, \$2 million for Lifesat spacecraft to study the effects of weightlessness on living organisms, \$2.4 billion for space station Freedom, \$2.8 billion for space shuttle operations, and \$113 million for the Advanced X-ray Astrophysics Facility (AXAF).

HUBBLE TELESCOPE TO GO UP NEXT

The launch is scheduled for about April 23.

VOYAGER 1 SNAPS SOLAR SYSTEM FAMILY PHOTO

Voyager 1's wide-angle camera was used in February to make a mosaic of the planets of the solar system.

GALILEO MAKES VENUS FLYBY

Galileo made its closest approach to Venus on February 9th. The encounter added 4990 mph to the spacecraft velocity that will be needed to reach Jupiter. 81 images and other data were recorded. Most of the data will be stored for playback in Oct. Fuel margins for the complete mission is now a positive 44 lbs, making the flyby of the asteroid Ida more likely.

CONSTRUCTION OF ENDEAVOUR IS PROCEEDING

Components now at the Palmdale assembly plant include the upper forward fuselage, lower forward fuselage, aft fuselage and flight crew compartment. The construction of Endeavour was greatly aided by a major structural spares program that NASA funded prior to the Challenger accident. NASA is requesting \$52 million for structural spares in FY 1991 in case another orbiter is damaged or lost.

SOVIETS FLY MANNED MANEUVERING UNIT

Soviet cosmonauts flew the MMU during at 5 hour EVA on Feb. 1, and again on Feb. 5. A

new crew docked with Mir on Feb. 13. The old crew returned home on Feb. 19 after 6-months in space. The new crew will process materials in the new Kristal Technological Module scheduled for launch March 30. The new module is also expected to carry a docking system that could be used by the Soviet space shuttle Buran.

PACIFIC TDRS PROBLEM

One of the satellite's two antennas is stuck in left circular polarization mode. As a result, the satellite can only track one spacecraft at a time for relaying data. This could hamper Landsats 5 and 6, the Hubble telescope and other spacecraft that require right circular polarized transmissions. NASA is considering modifying the shuttle orbiters Ku-band systems to transmit in left polarization and also reactivating the TDRS orbital spare. Another TDRS satellite is manifested for launch in January 1991.

CELESTIAL IMAGES

- JOHN GLEASON

PREPARING FOR COMET AUSTIN

If you missed Halley, the appearance of Comet Austin presents another good photographic opportunity. It's like 1986 all over again - another Springtime comet gracing our early morning skies in late April and May. Unlike Halley however, Austin will be much further north and much higher in the sky. We won't even attempt to predict how bright Austin will be, but it should be bright enough to be photographic in most camera lenses.

As many people will be thinking about photographing Austin, I offer a few words of advice from what I learned about photographing Halley from Fremont Peak and New Zealand.

Choose a camera/telescope that is f/4 or faster. Slower photographic f-ratios will mean long exposure times. Dawn photography of a comet has a short photographic window. As you wait for the comet to rise high enough in the sky to photograph, you need to be mindful of the oncoming astronomical twilight. Shorter exposures will give you many more shots in say a 1-hour photographic window, before the sky becomes too bright. F/2.8 seems to be an ideal photographic speed. Stopping your camera lenses down to f/2.8 from f/1.4 will significantly improve the stellar images from edge-to-edge on the film frame. Typical exposure times on 400 ISO film at f/2.8 will average from 5 to 15 minutes depending how high in the sky the comet is, and how much into astronomical twilight you are. Bracket your exposures, starting with the longest exposures first, ending with the shortest. Exposures into deep morning twilight

will probably be under 1-minute.

Use a minus-violet filter on your camera lenses. This is another way to significantly improve your star images and lens resolution.

For Halley, the 1600 ISO films from Konica worked extremely well. This color negative film can also be easily converted to slides at custom photography houses like Process Techniques in Sunnyvale. The 3200 ISO films, also from Konica will be good for those photographers who want to keep their exposures very short (around 1 to 5 minutes) and don't mind the additional granularity of this color negative film.

Piggybacking your camera on your telescope will be ideal. If photographing the comet near the horizon, remember to compose your horizon properly in the camera viewfinder. Use a tripod ball-mount for this application. Otherwise you will end up with tilted horizons that are not representative of the original view. Be thinking about photographic composition!

For short exposures, guide your telescope on the star background. This is ideal for wide-field to normal lenses. Yes, the comet will trail slightly during the exposure, but I have always found round, sharp star images much more attractive. If you guide on the comet's nucleus, then the star background will be slightly trailed. Your resulting picture will look more like a misguided exposure than anything else. With long focal length lenses - 300mm and up (including telescopes) - it will be best to guide on the comet itself to capture fine details in the inner coma and tail. The stars will appear as trails next to the guided image of the comet. The final result gives a representative feeling of the comet's motion against the background stars. Use a magnification that will allow you to comfortably guide on the comet's nucleus. Remember that you will be making constant right ascension and declination corrections, so your tracking platform should be equipped with slow motion controls to make these adjustments.

Make a checklist of necessary equipment. A forgotten cable release will be a real heart-breaker on a crystal clear morning.

Good Hunting!

The tenth annual Bay Area Astronomical Auction is approaching, so it's time to start looking around for those items not earning their space, whatever is astronomical or telescope-making related, that you would like to turn into cash.

Pre-registration makes it easy. Fill in the form below or a copy of it. List each different item you have. If there are several of one item, use a single line and show the quantity. Enter a minimum bid, even if you wish to let it go really cheap. Indicate whether the item is an outright donation; if not, the commission is 10% of the selling price. The SJAA share of all sales is tax deductible, and goes to further public education in astronomy.

Next, and most important, MAIL the complete form with a SASE, to Jim Van Nuland at 3509 Calico Ave., San Jose, CA. 95124. You may wish to keep a copy for your files. Jim will assign a bidder/seller and item numbers, and return the form to you promptly. If you omit the SASE, Jim will assign numbers, but hold the form for your pickup at the auction. Use adhesive labels to label each item, indicating the minimum bid and item number on each item.

To accommodate the increasing volume of good stuff, we will have a Swap Meet in the afternoon. No registration is needed for the Swap Meet. Items having a realistic minimum bid of \$5 or less probably should be Swap Meet material, as auction time is limited. Items of limited or specialized application, even if valued above \$5, should be considered for the swap meet.

A silent bid will run throughout the day. This is mostly for big ticket items such as complete telescopes. A sheet with the minimum bid is attached to the item; you write in a new bid and line out the old one. Results of the silent auction will be made final at the break and the winning bidders announced. However, a seller may close bidding and sell at any time.

DIRECTIONS to the Red Cross building

Take Hy.17 (880) toward Los Gatos. Take the Los Gatos-Saratoga Rd. (Hy.9) exit and continue west for 0.6 mile. Turn right on Rose Ave., then another immediate right into the parking lot. The address is 16011 Los Gatos-Saratoga Rd. Car-pool if possible.

Doors open at 1:00 pm, Swap Meet 2 to 5, auction from 6 pm. \$1 donation is requested for registration to buy or sell during the auction. Refreshments will be available. Come one, come all!

1990 SJAA Auction Registration				
Bidder Name: _____		Club: _____		
# _____	Addr: _____		City: _____ Zip: _____	
Item num.	Qty	Min. bid	Donation? Y/N	Description . . . (<60 charcters)

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