San Francisco Amateur Astronomers

c/o Josephine D. Randall Museum
199 Museum Way, San Francisco 94114

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BULLETIN FOR APRIL 1990

Date: WEDNESDAY, APRIL 18

Time: 8:00 P.M.

Place: Auditorium, J.D. RANDALL MUSEUM

Speaker: KEVIN MEDLOCK
GROUP 70, INC.

Topic: THINKING BIG -
BUILDING A 72" TELESCOPE

Think of Bay Area telescope-makers and two names come to mind: our own John Dobson and Kevin Medlock. Kevin made the optics and equatorial mount practically single-handedly for the 30" telescope at Fremont Peak, although construction of the observatory was a collaborative effort that drew widely from the local amateur community.

Many of the individuals involved in the Fremont Peak project, including Kevin, are now also participating in Group 70, perhaps the most ambitious amateur telescope-making project in history. Having purchased a 72" mirror blank gathering dust in Tasmania for decades, the group plans to build a classic f/10 Cassegrain scope with an f/3 primary and computer-controlled altazimuth mount. The scope is planned mainly for amateur research.

Kevin will be telling us all about the progress and prospects for the new telescope.

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COMET AUSTIN IS COMING and it could be spectacular! Thanks to Don Machholz, there's lots of good stuff about the comet in this issue, including the delightful story of its discovery. Be sure to get out and see Comet Austin; it won't be back for several thousand years!

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WELCOME to the newest amateur astronomer, Rebecca Bea Thwaites, daughter of SFAA members Michael Thwaites and Helen Bea, born February 6, 1990. Congratulations to the parents!

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ROCK SPRINGS IN APRIL

The club's regular monthly star party at Rock Springs on Mount Tamalpais is scheduled for April 28, beginning at sunset. For further information please contact Bob Levenson 468-3592 or Bill Cherrington at 752-9420.

STAR PARTY REPORT - by Gordon Ridley

Under the leadership of Douglas Wolfe and Tom Kellogg the club enjoyed an excellent star party at Rock Springs, Mt. Tamalpais on Saturday evening February 24th. On hand were a total of five telescopes ranging from a 3½ inch Questar to an 11 inch Celestron. While there were a number of thin clouds there was no wind and the sky overhead and to the south appeared clear. Fine views were had of the Orion, Crab and Eskimo Nebulas, as well as numerous open star clusters, galaxies and globular clusters. Guests included several astronomy students from College of Marin.

BOARD OF DIRECTORS MEETING

The next meeting of the SFAA Board of Directors will be on Wednesday, April 11, at 8:00 p.m. in the library of the J.D. Randall Museum. All SFAA members are invited to attend the Board meetings.

DO YOU KNOW THE WAY TO FIDDLETOWN?

Experiencing the Universe through a big telescope under an inky black sky is an adventure that you really shouldn't miss. And you don't have to! Thanks to the generosity of Bob Kestner, SFAA members enjoy access to a splendid observing site near Fiddletown in the Gold Country northeast of Sacramento.

If you're interested in deep sky observing at its best, you really should visit Fiddletown this summer. Star parties are held on the weekend nearest the New Moon:

April 21 May 26 June 23
July 21 August 18

You can just about count on finding some big scopes there, maybe even a 20" binocular telescope! Before you visit Fiddletown the first time, be sure to call Jim Shields at 585-4088 or Steve Gottlieb at 525-7968 to let us know you're coming. We'll tell you how to get there.

COMET COMMENTS

03-06-90

By 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 that 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 below 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.

EPHEMERIDES

Comet Austin ($1989c_1$)

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

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The story of Comet Austin's discovery is from the Comet Austin Observer's Packet prepared by Don Machholz. Unfortunately, copies of Don's finder charts could not be furnished for copyright reasons. You can get the complete packet by sending 85¢ in postage stamps to Don at 5234 Camden Avenue, San Jose 95124.

THE DISCOVERY OF COMET AUSTIN 1989c1

by Rodney Austin

These days I do my observing from just outside Inglewood, as my old site has been polluted by a pile of opossum carcases. The new site has several advantages. First, it is surrounded by trees, giving very good protection from wind. Secondly, it is way off the road so I do not get the problem of car lights that can occur even at my best site up at the Pouakai Ranges. Finally, it is also quite a fair distance from Mt. Egmont, so that I can escape the sheet of cloud which rolls over the ridge and wipes out the old site while the rest of the province remains clear. The disadvantages are that there is absolutely no horizon to the west, with the trees up to the 70 degree altitude. The eastern horizon is about 12 degrees, which I can live with but means that comets very low in the twilight are an impossibility. To the north a faint glow from the Synthetic Fuel plant at Motunui can be seen if the air is very humid, but to the south, there is a gap of a river valley, with the horizon going down to only two degrees or so. The lights of Inglewood are to the southwest, so they are completely out of sight.

In May of 1989, I purchased from the USA (via Barbara and Frank Ives of Aukland), a Meade 8-inch f/4 Schmidt-Newtonian. The mounting turned out to be completely substandard for my purposes, so a good friend and fellow member of the Taranaki Active Astronomers Group (Steve Fergusson) manufactured a very fine alt-az mounting, in a startingly short time. The telescope now rotates in altitude around the eyepiece as did the old 6-inch refractor which I used for the previous two comets. The eyepiece I use is 2-inch diameter 40mm Clave Plossel which I purchased when we closed down the Ribbonwood Halleywatch site in 1986. As the telescope works basically at f/4, this means that the exit pupil is far too large, so I recently acquired a 2-inch diameter 2x Barlow through Graeme Jones. This takes the telescope out to f/8, with a magnification of 41x. This system gives a usable field of 1.7 degrees and an exit pupil of 5mm, ideal for widefield dark sky observations. Here the only problem is that the telescope is designed primarily for photographic work, and so has; first a large secondary obstruction ratio, and second, the entire eyepiece assembly projects about 12 inches from the side of the tube. Even this is not a great problem, as it can be used very easily as a driving handle in azimuth with a great turning movement.

The whole instrument is a real breeze to set up and use, unlike the massive wooden box of the 6-inch folded refractor. The counter-weights to be lifted into place are also considerably different. The whole instrument is about half the weight of the refractor, including mounting, and the telescope itself is only 19 pounds, compared to 54 pounds for the refractor. This saves my back from any more of the injuries I have suffered over the past three years. The mounting also features a very clever quick-release system, which allows rapid installation of the telescope once the mounting is assembled. The finder is a standard Telrad which I find very convenient to use for comets.

The night of December 6/7 was one of those strange frustrating times at work when Murphey's Law prevailed for most of the evening. Taranaki Newspapers has recently installed a new direct editorial typesetting system which still gives problems, so everything was late. Instead of the newspaper going to press at the normal deadline of 1:20 AM, the paper did not roll until about 2:15 AM. I finally left the building right on 2:30 AM, to find that the night was still clear, as it had been for several nights. This time there was a small difference however, as the strong south-easterly wind had died and there was no cloud out towards Inglewood. I arrived on site and set up the new telescope in about five minutes. The real aim of the observing session was simply to check out Comet Okazaki-Levy-Rudenko. A previous observation had showed a broad diffuse coma with little in the way of a condensation, and I was interested to see if it was caused by a gas shell being ejected from the comet. This morning the coma was fainter and a strong condensation was evident. The tail could be seen to the diameter of the telescope field, as a very faint spine of gas.

As I was going to Tauranga to a wedding the following morning, I had decided that the morning of December 7 was my last chance of doing any comet hunting until the next run started when the moon faded in mid-December. With only an hour to twilight, I finally decided that nothing would be lost by searching the direct southern sky from the altitude of the pole down to the horizon, and scanning from southeast to southwest.

I started just south of the constellation Crux and slowly scanned westwards in horizontal sweeps. There are a couple of very nice globular clusters just south of the Southern Cross so having indentified these, I moved on. Several interesting objects were seen in rapid succession as I swept just below the Small Magellanic Cloud.

After half an hour of this and on about my tenth scan, I suddenly came to a stop. Something extremely faint had caught my attention. Flicking my eye around the field, I could see that there was something barely visible, forming an equilateral triangle with two stars of about 12th magnitude. I noted the time on my observing log as 03:52 NZDT (14:52 UT). Now came the careful checking of position. Normally this is very quick, but this time I had a little difficulty as the field overlapped two charts of the AAVSO charts. Finally satisified that I had the correct area, by checking with 11x80 binoculars as well, I came to the conclusion that the object was real and it was not marked on any chart that I had with me. At this point I drew a field sketch, and I made my one mistake. The positions on the AAVSO are in odd steps, so I took the Right Ascension as being 3 minutes (0.4 degree) less than the correct one. This normally wouldn't matter particularly if I was merely checking off a known object, but this time it led to a financially expensive complication.

By the time that I had completed all this and had realized that no motion was detectable, it was twilight. I packed up everything and drove home feeling somewhat tense. At home I have a copy of the Canterbury Sky Atlas, which had played a major role in the discovery of my first comet. These charts are true photographs, not just litho-prints from photographs. Careful inspection of the chart under a high-power magnifying glass confirmed the field chart, and more importantly showed no fuzzy blob at the correct position.

A quick check of the BAA Handbook showed that there was no periodic comet at that position, apart from which the object was at -62 degrees, a most unusual declination for a periodic comet anyway. Nor was it a recently reported discovery that I knew about. So it was a comet, and a new one to boot.

I next rang Peter Birch at home in Perth, Western Australia. Having a friend in the comets game four time zones to the west has a distinct advantage when trying to get a comet confirmed. Peter was not at home having been showing a group of visitors around the Perth Observatory that evening, so that necessitated a second call. Having passed on the position (the wrong position) I rang Mt. John University Observatory (in New Zealand) and spoke to Mike Clark. The wrong position was passed on there as well. Luckily, I at least had the declination correct, so it would have been only a matter of time before the mistake was detected. About half an hour later, I rechecked the position 'just to be sure', and the alarm bells started to ring, along with the telephone at Perth Observatory. Peter realized who was ringing and opened the conversation with "I can't see anything at that position mate!". However, having been given the correct position, he started to correct the telescope, while I stayed on the line listening to the relays clicking over 6000 km away. Dead silence; then, "It's there alright!" Great relief. Of course at that stage of proceedings, it was definitely confirmed as a comet, but with 99% certainty, I started to relax. Then I re-rang Mike at Mt. John with the corrected position, only to find that the sky was covered with cloud anyway, quite apart from the fact that by this time it was broad daylight. Alan Gilmore telexed the news to the Smithsonian Observatory in Cambridge, Mass., USA, in any case; which shows a very gratifying faith in my observing ability.

At this point, the whole matter was out of my hands, so I went to bed to catch up on some much-needed sleep. Peter ringing from Perth confirmed that the object was indeed moving, and that the third Comet Austin was on it's way.

As I write this, the preliminary orbit has been calculated and it is clear that the comet is still a long way from perihelion, and it is likely to become one of the best comets for some years. Just how good remains to be seen, but it will certainly become a naked-eye object, as were my first two comets.

My first comet (Comet Austin, 1982 VI) took a total of 151 hours spread over fifteen years; the second (Comet Austin, 1984 XIII) took 43 hours over two years and now this one after only 49 hours of hunting spread over five years. A total of only 243 hours in my career. I really have been very lucky.

With this discovery, I equal the New Zealand resident comet-hunting record which has stood for just over 80 years. It is an awesome feeling, as is the feeling that I am the first person out of five billion on the planet, to see this comet. The feeling is addictive.

END

EXPLORING IN LYNX by *Steve Gottlieb*

Between the prominent constellations of Ursa Major and Auriga lies the barren region of Lynx, a constellation notably lacking in bright stars. For this reason, I find myself wincing when I discover that the object I want to track down is located in this area. Just finding a suitably close naked-eye star to begin starhopping can be a chore! Nevertheless, for the persistent deep sky observer, we can find here a distant globular cluster, a bright edge-on galaxy, an unusual galaxy dubbed the "Bearpaw", a rich Abell galaxy cluster, a giant planetary and many fine multiple stars.

The sole globular, NGC 2419, is located 7° north of Castor at 7h38.1m +38°53 (2000). Situated over 200,000 light years from the galactic center, it's distance is comparable to the Magellanic Clouds and may in fact be extragalactic. Nevertheless, it is easily visible in an 8" scope as a small, faint, hazy patch about mag 11. Resolution is virtually impossible even in large amateur scopes as the brightest stars are just Mag 18. You'll find the globular is collinear with 2 mag 8 stars to the west and the 3 objects are equally spaced along this line.

The brightest galaxy in Lynx is NGC 2683, a mag 10 beauty located 6° west of third magnitude Alpha Lyncis at 8h52.7m +33°52. In my C8, 100X revealed a bright, very elongated streak 8'x1.5' in length. With my 13.1" at 166X, this is a real showpiece with a bright middle that appears mottled and dusty and long thin arms extended southwest-northeast.

In a barren portion of the constellation at 8h13.2m +46°00 is a dusty Sd galaxy NGC 2537, dubbed the "Bearpaw". Although visible in my C8 as a faint, round hazy region, a large scope is required to bring out its curious structure. In my 17.5", the normally brighter central section of the galaxy contains a dark vacuity or a dark lane and a bright knot (actually a huge H11 region) is visible along the NW edge of the galaxy. Interestingly, this galaxy was actually classified as a globular cluster in the NGC and John Herschel felt he had resolved this object into many extremely faint Mag 20 stars!

Conveniently located just 40' south of Alpha (the brightest star in the constellation at mag 3.1) is a faint but rich galaxy cluster, Abell 779. Its brightest member is NGC 2832 which is just visible in an 8" but appears moderately bright with a bright core and an elongated halo with my 17.5" at 220X. Close scrutiny will reveal that it forms a triple system with NGC 2831, an extremely compact companion situated at its southwest edge and NGC 2830, very low surface brightness edge-on galaxy just 1.4' southwest of NGC 2832. Careful exploration with my 17.5" at 220X revealed a total 8 galaxies within a 30' circle centered on NGC 2832. This cluster was discovered by Lord Rosse, using a 72" in 1850 and he logged from 12 to 15 members during 9 different observations. Most of the members have NGC designations and are plotted on the **Uranometria 2000.0** but are very faint nevertheless.

One of my favorite obscure planetaries is Jones-Emberson 1, a giant object with dimensions 405"x360" with an integrated visual magnitude of 12.0 and located at 7h57.8m +53°25. This object benefits greatly from an O111 filter because of its very low surface brightness and you could easily pass over it with any scope without a filter. Using my 17.5" at only 82X, it is very large and annular with 2 brighter enhanced arc sections along the southeast and northwest rim. Interestingly, because these arcs are so prominent photographically, the planetary has been confused in both Burnham's **Celestial Handbook** and the Skalnate-Pleso **Atlas of the Heavens** with a small pair of elliptical galaxies, NGC 2474/2475 located 33' south.

In the northwest corner of Lynx is an excellent triple star 12 Lyncis situated at 6h46.2m +59°27. We find here a mag 5.4 and 6.0 pair just 1.7" apart aligned east-west with a third mag 7.3 companion at 9". The close pair resolves at 165X in the C8. With how small a scope can you split this pair? Moving to a closer separation, an excellently matched double is Σ1338, located at 9h21.0 +38°11 near the Leo Minor border. This pair has been decreasing in separation and now stands at about 0.7". With equal magnitudes of 6.5 and 6.7, though, this is an ideal test star. Back in 1984, I was able to resolve this duo into two tangent disc at 300X with just a 5" mask on my 13.1". Today, a 6" or 8" is probably required to do the trick.

Riverside Telescope Makers Conference

Dear Fellow Amateur Astronomers;

The 22nd Annual Riverside Telescope Makers Conference will be held May 25th through the 28th, 1990. It will be held at the Y.M.C.A. Camp Oakes which is eight miles east of Big Bear City on Highway 38 at Lake Williams Road. This location is about 50 miles northeast of Riverside in the San Bernardino mountains at an elevation of 7,300 feet. Find Highway 38 off of Interstate 10 in Redlands.

This year the conference will be held in conjunction with the Western Amateur Astronomers.

Due to the need to plan this Conference far in advance, like last year, the prices will be discounted for all registrations received before May 1, 1990.

MEALS AND LODGING

We offer five package plans.

1. Five meals and lodging (or camping). Begins with the Saturday noon meal and ends with the Sunday evening meal.
   $48.00 per person
   After May 1st $58.00 per person

2. Six meals and lodging (or camping). Begins with the Saturday noon meal and ends with the Monday morning meal.
   $50.00 per person
   After May 1st $60.00 per person

3. Six meals and lodging (or camping). Begins with the Saturday morning meal and ends with the Sunday evening meal.
   $50.00 per person
   After May 1st $60.00 per person

4. Seven meals and lodging (or camping). Begins with the Friday evening meal and ends with Sunday evening meal.
   $54.00 per person
   After May 1st $64.00 per person

5. Eight meals and lodging (or camping). Begins with the Friday evening meal and ends with the Monday morning meal.
   $56.00 per person
   After May 1st $66.00 per person

SATURDAY PARKING: Persons who arrive for the day only on Saturday please note that beginning at 9:00 a.m. you will be directed to monitored parking areas and driven into the conference area. This is helps solve the Saturday parking problem. We will use regularly scheduled vans from the adjacent Lake Williams area and main gate of the camp.

AWARDS: Merit award certificates and plaques, which are all of equal value, will be awarded for displays, telescopes, or parts implemented, design, craftsmanship, and use of related equipment or accessories. The Warren Estes Memorial Award will be given for the best telescope made from simple materials. The Clifford W. Holmes Award is presented to the amateur astronomer contributing the most to amateur telescope making. The awards will be presented Sunday evening. The Carolyn Herschel Award, the E.E. Barnard Award, and various regional awards will also be presented.

Please note: All telescopes entered for merit awards should be located on Michaud Field or Telescope Alley. This is because the awards committee has a difficult time finding telescopes scattered all over the camp. We do not wish to miss your entry. Please contact the telescope registration at the Charles Walker Observatory prior to set up. Sites will be numbered for identification.

KEYNOTE SPEAKERS: Dr. Brian Marsden, Director of the Bureau for Astronomical Telegrams, International Astronomical Union will be our Keynote speaker on Saturday night.

Dr. Clyde Tombaugh, discoverer of Pluto, and Dr. James Christy, discoverer of the moon of Pluto, will be on hand celebrating the 60th anniversary of the discovery of Pluto.

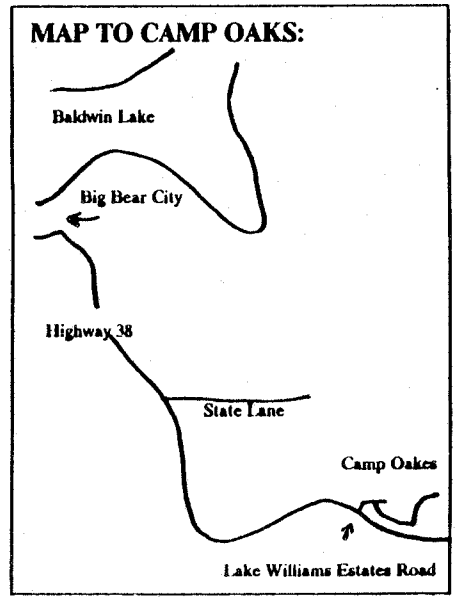
SPEAKERS: We are requesting papers related to telescopes and equipment. Please contact Cliff Holmes, by May 1st, 1990, at 8642 Wells Avenue, Riverside, Ca. 92503, (714) 689- 6893. Video presentations are encouraged.

A complete text of your presentation should be sent to John Sanford, 2215 Martha St., Orange, Ca. 92667, (714) 639-8446, for inclusion in the printed proceedings. They will be prepared and sold by the Orange County Astronomers for $12.00 ($14.00 after May 1st).

COMMERCIAL EXHIBITORS: Space is available to show and explain your astronomical products. Please contact Wayne Johnson, 2630 Raven Circle ,Corona, Ca. 91720, (714) 386-2573 for full details.

COMET AUSTIN: Comet Austin should be of naked eye visibility in the morning sky. **NEW MOON!!!**

MAP TO CAMP OAKS:



SAVE MONEY REGISTER PRIOR TO MAY 1, 1990!!!

OBSERVING THE SUN - by Eppler Nowell

You may recall that my last letter told you about our decision to watch the Sun from our table inside our house. Now I'ld like to talk a little about why we chose our system to record the sunspots we saw through our three-and-a-half inch Questar with the sun filter. (Extremely important! Without the filter, you would ruin your vision for ever.) No, we do not project the image.

Actually, there were two systems available: One would be sketching; the other would be photographing. Neither of us are artists, but common sense quickly settled the question in favor of sketching. Bad as our sketches were, we still knew that attempting to draw something is the best way to learn form and position of an object.

Second - we didn't need to learn another skill which would require additional equipment and a lot more time.

Third - we could study the results immediately, since we didn't need to process any film.

And, last - we were able to make a compact file of the sketches since we use light-weight 5x8 paper. (1/2 of the standard 8x10 size) We draw an empty circle around a jam jar lid, fill in the spots we see, and record the date each time we observe. The Sun changes every day, so we like to look often.

Since the Sun orbits on its own axis, we find that a particular spot will advance about 13 degrees each day. It takes about two weeks (if it survives the whole trip) to travel from the East to the West rim (edge). Here the spot will disappear from view to travel across the back of the Sun. If it again survives it will reappear two weeks later at the Western edge.

You may well ask, "How, for Pete's sake, can you tell if it's the same spot?"

Good question! So, position of sunspots and (certainly more basic) what sunspots are will be the two subjects I'd like to talk about next time in our Sun Column.

MORE ON RIVERSIDE

Riverside is always a lot of fun. If you don't want to pay for meals and lodging, you can camp ($20 before May 1) or visit for the day ($9 before May 1). The conference grounds and snack bar open at 1:00 p.m. on Friday, May 25. The swap meet on Saturday is one of the highlights of the conference.

If you need a registration form, contact Jim Shields or write Riverside Telescope Maker's Conference, C/O Fox & Stephens, CPA's, 9045 Haven Avenue Suite 105, Rancho Cucamonga 91730.

This monthly calendar is available with membership in the Astronomical Society of the Pacific, 390 Ashton Ave., San Francisco CA 94112.

SKY CALENDAR APRIL 1990

An aid to enjoying the changing sky

Use this scale to measure angular distances between objects on diagrams below.

0° 10° 20°

3 bright morning planets: Venus, mag −4.3 to −4.1, is most brilliant "star", low in ESE in dawn midtwilight, about ¾ hour before sunup. Venus is 46° W of Sun on Apr 1, closing to 44° W on Apr 30. **Saturn,** mag +0.6 to +0.5, is bright in SSE at dawn. In Sagittarius well E of Teapot, Saturn shifts only 0.9° E in April. **Mars,** mag +1.0 to +0.8, is the red 1st-mag "star" about ⅓ of the way from Venus toward Saturn. On Apr 1 Mars is 10° upper right of Venus and 21° lower left of Saturn; these quantities double by Apr 30. Mars goes 22° E, from Cap into Aqr; see Apr 7. **Two faint morning planets: Uranus & Neptune,** only 5° apart, linger near turning points at left end of their tracks shown on last month's Sky Calendar. **To locate Uranus,** use binocs to starhop to M22 and 26 Sgr, as described last month. 5.7-mag Uranus is within ½° NNE of 6.1-mag 26 Sgr and 0.1° S of unlabeled 7.4-mag star. **To locate Neptune,** starhop to 4th-mag ο (Omicron) Sgr as noted last month. 8th-mag Neptune is 0.3° W of Omicron.

Evening planets: Jupiter, of mag −2.2 to −2.0, is most brilliant "star" at dusk, very high in SW to W. In April Jupiter goes 4° E in Gemini, passing two 3rd-mag stars in Castor's foot; see Apr 5, 18. **Mercury** is a naked-eye evening planet first 3 weeks of April, and visible in binocs a few days longer. Look very low W to WNW in eve midtwilight. On Apr 1 Mercury is 14° E of Sun and shines at mag −1. On Apr 13 Mercury reaches greatest elongation, 20° E of Sun and is of mag 0. By Apr 22 Mercury falls back to 15° from Sun and fades to 2nd mag. See Apr 4, 13, 19, 25.

Telescopic views: Venus on Apr 1 shows disk 24" (arcseconds) across and half full. By Apr 30 it shrinks to 18" and waxes to 64% full. **Saturn's rings** extend 38" at midmonth, and are tilted 22.3° from edge-on. **Jupiter** shows disk 36" across at midmonth. Moons: See Apr 12, 18. **Mars** at midmonth shows tiny 6" disk, 90%

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Sunday evening: 1 Moon approaching First Quarter Jupiter very high WSW β Tauri (Bull's N horn) γ Tauri (Bull's S horn)	**Monday and Tuesday evenings, April 2 and 3:** Castor Pollux Tuesday Apr 3 very high SSE Monday Apr 2 very high SSW Jupiter	**Wednesday April 4, 1 hour after sunset:** **Comet Austin** may now be 1st mag, but sets just after eve twilight. Use binocs. Comet now shifts 1⅓° daily against stars. γ And α Ari β And β Ari Comet Austin W Mercury WNW	**Evening: 5** Regulus Moon Jupiter 1.0° N of 3rd-mag Eta Gem, Castor's toe. Watch Jupiter move next 2 weeks.	**Comet update:** Feb, Mar, Apr *Sky & Telescope & Skyline* 617-497-4166 Aldebaran **Saturday April 7, morning:** Saturn Mars Venus Watch Mars pass 1.3° N of 3rd mag γ and δ Cap (Goat's tail) Apr 9 & 12. ESE SE	
One hour after sunset: 8 Moon Spica ESE	**Comet Austin** at perihelion tonight, 0.349 a.u. (33 million miles) from Sun. **9** One hour after sunset: Full Moon at opposition Spica ESE	**One hour after sunset: 10** Spica Moon rising in ESE	Pleiades **Wed Apr 11, 1 hr after sunset:** **Comet Austin** may be of zero mag, but sets as darkness falls. Use binocs. γ And Mercury α Ari Comet Austin β And WNW β Ari NW	**Thurs April 12** Ganymede & Callisto, outermost of the four Galilean satellites, are both E of Jupiter tonight and next two nights, and easily seen in binocs.	**13** Hyades Pleiades Evening: Mercury at greatest elongation, 20° E of Sun W	**Mornings:** Antares Sat Apr 14 Fri Apr 13 SSW
Comet Austin 15 discovered Dec 6, 1989, will soon be very well placed in predawn sky, where it may shine at 1st or 2nd mag. If early predictions hold, it could be the most impressive since Comet West in 1976. 1½ hours before sunrise this morning, look 5° below β And. Diagram and more below.	**Monday through Wednesday mornings, April 16-18:** Saturn Tues 17 Monday Apr 16 Wed 18 Moon at Last Quarter, now out of way and dim enough to allow observation of Uranus & Neptune before first light of dawn. Use binocs, finder on March *Sky Calendar*. Venus 0.2° N of 3rd-mag λ Aqr Apr 17. SSE S	Sun enters Aries today. **18** Callisto, outermost of Jupiter's moons, will appear farthest W of planet on Apr 21. Watch it move outward until then and back in close by Apr 25. Jupiter will be 0.9° N of 3rd-mag Mu Gem (Castor's heel) tomorrow night.	Aldebaran and Hyades **19** Pleiades Evening: Now mag 1½, Mercury fades rapidly next few days. Mercury W WNW	**Fri Apr 20, morning:** Moon Mars Venus ESE	**Morning: 21** Moon Mars Venus ESE
Predawn: Peak of Lyrid meteors. 22 **Morning: Earth Day** Mars Moon Venus ESE	Apr 24-27: Comet Austin 5° from Andromeda Galaxy M31; see comet finder chart below. **Monday and Tuesday, April 23 & 24,** 30 minutes before sunrise: Moon, Monday 23 Very old Moon Tues 24 ENE E Venus CASSIOPEIA	New Moon **25** 12:27 am EDT Ald (9.27 pm PDT on Apr 24) **Wednesday evening:** Hyades Pleiades Moon's age 20-23 hrs contiguous U.S. Don't miss very young Moon! Merc too faint WNW	**Evening: 26** Aldebaran Moon Hyades Pleiades WNW	*April Evening Skies* (over) shows tonight's sky in mid-twilight. Can you still see Rigel? Observe each clear evening, and try to see Rigel, Pleiades, Orion's belt, Aldebaran, Sirius, and Betelgeuse on last possible dates. **27**	**Evening: 28** Pollux Castor **Astronomy Day:** Contact local astronomy club or planetarium and join in on activities. Jupiter in west Moon
Evening: 29 Pollux Castor Moon Jupiter	**Evening: 30** Moon Pollux Castor Jupiter	**Comet Austin in Predawn** Daily positions Apr 15-May 5 Stars shown for Apr 25 1 hr 40 min before sunrise (start of morning twilight) α Per γ And NNE	Andromeda Galaxy M31 β Peg 5 May 30 Apr 25 20 15 Apr α And GREAT SQUARE OF PEGASUS γ Peg β And δ NE ENE E			

Comet (cont'd from Apr 15): Higher each morning, Comet Austin passes 1° from β And Apr 19 & 20. Comet shifts 1°/day against stars in late April, and speeds up to over 5°/day as it sweeps only 21 million miles from Earth on May 25. This approach may keep it at 2nd mag through most of May, but *note comet brightness forecasts are notoriously uncertain!* Comet will track N of Great Square May 1-11, then in late May on past beautiful Delphinus, Altair, and several deep-sky objects of summer Milky Way. **More in May *Sky Calendar*.**

Robert C. Victor, Jenny L. Pon, Robert D. Miller
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Extra Subscript' n: $6 per year, starting anytime, from ***Sky Calendar***, Abrams Planetarium, Michigan State University, Eas ng, Michigan 48824

WINTER STAR PATTERNS - by Gordon Ridley

Before the winter constellations are gone from the sky be sure and take a look at some of the interesting asterisms or star patterns readily visible to the naked eye.

For example, the winter triangle. similar to the summer triangle, this trio of stars consists of that red giant Betelgeuse, plus Sirius, the Dog Star, and Procyon, the Little Dog Star, both of which are located east of Betelgeuse.

A second asterism is part of an even larger grouping and is known as the "Heavenly G". To draw the "Heavenly G" on the map, start at Capella, now nearly overhead in the sky, and draw a line to Beta Aurigae to its left, then left to Castor and Pollux, down to Procyon, down to Sirius, then over to Rigel, up to Aldebaran, and back left to Betelgeuse. The stars will stand out better in the sky than on a chart. This large asterism ties together six major winter constellations and helps to keep them properly located. For the time being, Jupiter is now located within the asterism, between the feet of Gemini and the horns of Taurus.

SFAA PUBLIC SERVICE - by Irving Hochman

On Thursday, March 1, Joel Goodman gave a talk on astronomy to a group at the Bethany Center Senior Housing complex at 580 Capp Street. About 20 ladies who live at the Center attended and heard an hour-long address in simple, non-technical language. The talk was accompanied by a number of slides, showing the nature and beauty of galaxies, planets and moons.

There were many interesting questions from the audience. Joel was able to make the connection and explain the relevance of things great and small. As a professional microbiologist and researcher he deals daily with objects on the microbial level; as an amateur astronomer he's concerned with objects on a galactic scale. The audience appreciated both the similarities and the differences, and warmly applauded his effort.

BULLETIN CONTRIBUTIONS

The SFAA Bulletin is a forum in which club members may share their ideas and experiences in astronomy. We encourage you to participate and welcome your letters to the editor, announcements and articles on astronomical topics. Please send them to SFAA Bulletin, C/O Jim Shields, 190 Chilton Avenue, San Francisco 94131. The deadline is the 18th of the month before publication.

SFAA MEMBERSHIP BENEFITS

Membership dues of $15 per year include the monthly SFAA Bulletin and free entry to all club activities, such as lecture meetings, star parties, picnics and field trips. In addition, members may subscribe to SKY AND TELESCOPE, ASTRONOMY, DEEP SKY and TELESCOPE MAKING (any or all) at greatly reduced rates. For more information please contact Chelle Beard, 32 Penhurst Avenue, Daly City 94015. Phone: 878-4965 evenings.

San Francisco Amateur Astronomers

c/o Josephine D. Randall Museum
199 Museum Way, San Francisco 94114

CLASSIFIED ADS

Members' ads are free and will run three times. Please notify the Bulletin editor if an item is sold so the ad may be deleted. This service is provided monthly on a space-available basis.

FOR SALE - Ultra-compact 13.1" f/4.5 Dobsonian. Coulter Mirror. Serrurier-truss mount; 2" focuser with adapter; Telrad; 16mm University Optics Konig. $650. Rick Decker 956-7070/383-6339.

WANTED - Tom Kellogg and his wife Jeanne may be looking for a house to rent for under $1,100/month on Bernal Hill, Potrero Hill or Westlake. Any tips on available housing will be appreciated. Must be on a quiet street and have plenty of windows and a garage. Call 641-7358 (home) or 894-2704 (work).