

EPHEMERIS

OF THE SAN JOSE ASTRONOMICAL ASSOCIATION



JUNE 1986

DON MACHHOLZ DISCOVERS HIS 3RD COMET !
WHAT A GUY !

***** JUNE 28TH 8 PM *****
* HALLEY'S COMET WRAP UP *
* ASTROPHOTOGRAPHY OF THE SOUTHERN SKIES *

- JUNE 7 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION TO HENRY COE STATE PARK. DUSK TILL DAWN.
- JUNE 14 INDOOR STAR PARTY AT THE LOS GATOS RED CROSS BUILDING. BOARD MEETING AT 7 PM.
- JUNE 21 INTRODUCTORY ASTRONOMY CLASS AT THE LOS GATOS RED CROSS BUILDING. 8 - 10 PM.
- JUNE 28 GENERAL MEETING 8 PM, LOS GATOS RED CROSS BUILDING. HALLEY'S COMET WRAP-UP. THIS WILL BE A HALLEY'S COMET PRINT AND SLIDE NIGHT BROUGHT TO YOU BY MEMBERS OF THE SJAA WHO VISITED AUSTRALIA AND NEW ZEALAND THIS PAST APRIL. ALL MEMBERS ARE ENCOURAGED TO BRING THEIR COMET PHOTOGRAPHY TO SHARE WITH THE CLUB. THIS IS NOT INTENDED TO BE A TRAVEL LOG, BUT RATHER A SHARING OF OBSERVING EXPERIENCES COMBINED WITH ASTROPHOTOGRAPHY. DON'T MISS IT. MR. VIDEO WILL ALSO SHOW A TAPE OF THIS YEARS BIG BEAR CONFERENCE FOR ANYONE INTERESTED, AT THE END OF THE MEETING. SEE YOU THERE!
- JULY 4/5 GLACIER POINT STAR PARTY, YOSEMITE NATIONAL PARK. ANNUAL RETREAT TO THE DARK SKIES OF YOSEMITE. <MORE INFO INSIDE>
- JULY 5 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION TO FREMONT PEAK STATE PARK. DUSK TILL DAWN.
- JULY 12 ANNUAL SJAA PICNIC. THIS YEARS PICNIC IS TO BE HELD AT GRANT RANCH COUNTY PARK. 1 PM TILL ??. BOB FINGERHUT SAYS THAT HE WILL BRING THE BURGERS AND BUNS. MEMBERS BRING THE REST. EVENING OBSERVING TO FOLLOW. THIS IS A FIRST QUARTER MOON WEEKEND.
- JULY 19 INTRODUCTORY ASTRONOMY CLASS AT THE LOS GATOS RED CROSS BUILDING. 8 PM TILL 10 PM.

FIELD OF VIEW BY: JOHN GLEASON

GLACIER POINT STAR PARTY SCHEDULED



Every year the SJAA conducts a scheduled star party for the national park service at Yosemite's Glacier Point. This year the date is confirmed for the July 5th weekend. Specifically Friday night July 4th and Saturday night July 5th.

Camping space has been reserved for our group for no more than 30 persons in Bridalveil creek Campground. Sites will be in the group camp and will be available on Friday and Saturday only. If you wish to come earlier and/or stay longer, you will need to purchase a campsite. This is also true for persons in excess of the 30 which can be accommodated in the group camp.

I want to send a list of persons who will be using the group camp no later than 2 weeks prior to the star party dates. This list will be given to the campground host and referred to as people check in upon arrival.

To reserve your spot in the group campground area, please contact your editor at 415-790-9250. Please leave your name, address, telephone number, date and time called, and most importantly the number of people in your party. Free camping for the group area will be on a first come, first served basis so call as soon as you can. Last year I had to turn away many members.

COMET MACHHOLZ 1986e

Here is late breaking information about Comet Machholz. It was discovered on the morning of May 12th at 3:52 am. Near the Andromeda Galaxy, the discovery coordinates were RA: 00h 40.8' DEC: +38° 36". Don estimated the discovery magnitude to be near 10.4 as he was using a 29 x 130 mm binocular. Size of the comet is about 2 to 3 minutes of arc. The comet, west of M31, rises around 2 am. Don logged 173.5 hours to discover his third comet. This is 1/10th the average of his previous discoveries, both around 1700 hours. It's been exactly 50 weeks since his last comet discovery which was from the Big Bear Telescope Conference last year. This particular discovery may just give Don the title of the only living american amateur with the most comet discoveries. More information to come.

C.T. ENGLISH SCHOOL

Due to a communication problem between the SJAA and the C.T. English School Principal, the SJAA will not be allowed to use the school as a local observing site. It seems that the 10 or 12 SJAA members that used the site for a scheduled star party represented a conflict of interest with other privileged individuals who also use the school. Our sincere thanks to the school's principal for allowing us to use his site for the brief period in March and April.

A.S.P. TO MEET IN BOULDER, COLORADO IN JULY 1986

The 98th Annual Meeting of the Astronomical Society of the Pacific will be held from July 12 through 17, 1986 at the University of Colorado in Boulder. The meeting will include a scientific symposium on "Starbursts and Very Young Stars," a 3-day workshop on teaching astronomy in grades 3 through 12, a series of nontechnical lectures by noted astronomers, an awards banquet, tours of local astronomy facilities, and a Bart J. Bock Memorial Public Lecture to be delivered by astronomer/astronaut Karl Henize. For more information and registration forms, write to: Summer Meeting Dept., A.S.P., 1290 24th Ave., San Francisco, CA. 94122.

STILL LOOKING FOR HALLEY REPORTS

I guess that hardly anyone got out to see Comet Halley this past March or April since I have only received a handful of reports from members. I will say this much to encourage members to send in reports. Members of the "Halley's Comet Sky watch" to New Zealand, headed up by Don Machholz and myself saw Halley's Comet with a 15-degree tail from New Zealand's Mt. John Observatory in early April. So what was the view like back here? Just drop me a few lines, I'll see that it gets published next month. Don't be surprised if I come around and ask you at the next meeting for a few words about your visual impressions.

TRUDY BELL TO SPEAK AT E.A.S. MEETING

What you read in magazines doesn't appear there by magic. Each editor exercises preferences -- biases -- that influence the selection not only of articles, pictures and writers, but also which causes get trumpeted and which get ignored. Editors and staffs, freelance writers, illustrators, corporate executives, astronomers and the universe beyond all mix around to influence which astronomical articles get published in which magazines which months, and what they look like.

Trudy Bell was active in the San Jose Amateur Astronomers during her high school and college years, 1964-71, writing for their bulletin, leading grazing-occultation expeditions, and serving a year as president. At UC Santa Cruz her interest went from physics to history of science (in which she has since earned a master's at NYU). She was a Lick Observatory technician and tour guide 1968-70, and mission controller for Pioneers 6, 7, 8, and 9 at NASA Ames in 1971, but caught the science-writing bug and went to New York. She has more than 150 articles in print in more than 25 magazines, from Travel & Leisure to Family Circle, and is proud of her science fiction novelette in Analog. She has successfully observed 5 total solar eclipses, has taught history of science at Hayden Planetarium and science writing at numerous colleges, and tells lots of neat stories. SCHMALTZ, SEX & SCIENCE: THE INSIDE STORY OF GETTING (OR NOT GETTING) ASTRONOMY INTO PRINT. 8 pm, Saturday, June 7, 1986. At the Chabot Observatory, 4917 Mountain Boulevard, Oakland.

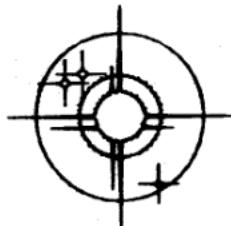
MISSING HALLEY ASTROPHOTOS

Jack Zeiders reports that he is missing 5 Halley's Comet slides that he showed at the April 19th indoor star party at the Los Gatos Red Cross. It's possible that these slides may have gotten mixed up with other slides that were being shared in the same slide tray. If you displayed slides this evening, please check to see if you accidentally picked up Jack's too. Please give Jack a call at: 408-246-6189 eves.

MEMBERSHIP RENEWAL TIME AGAIN

It's time to renew our memberships with the SJAA. If you receive as part of your membership, Sky & Telescope magazine, then you will be receiving a renewal notice from Sky Publishing. So as not to miss a single issue of Sky & Telescope or the Ephemeris, please send your S&T renewal notice along with the handy membership application on the back of this bulletin, and a check made out to the SJAA in the amount of \$21 to: Jack Peterson, Treas., San Jose Astronomical Association, 1840 Yosemite Dr., Milpitas, CA. 95035. If you only subscribe to the Ephemeris, then only send your \$8 subscription fee, with the membership application to Jack. Please check the renewal box on the form. The last Ephemeris sent to those who have not renewed will be the July 86' issue.

COMET COMMENTS BY: DON MACHHOLZ



Comet Halley remains in our evening sky, getting fainter as it pulls away from both the earth and the sun. Comet Boethin is now beyond the reach of most of our telescopes. I have some new information on Comet Hartley, discovered in March. Finally, the fourth comet of the year, Comet Singer-Brewster, has been discovered at magnitude 15 in the constellation Libra. I'll have more news about this comet next month.

Periodic comet Hartley 2 (1986c): An orbit has recently been calculated by Dr. Brian Marsden of the Smithsonian Observatory. The comet is periodic (6.2 years), and was closest the sun on June 5 of last year. At a perihelion distance of .96 AU it should have been visible, but it was on the opposite side of the sun as the earth. Between mid-April 1985 and mid-September 1985, the comet was within 24 degrees of the sun and magnitude 11-12. As seen from the earth, it would have passed two degrees south of comet Machholz on June 24, then three degrees north of Comet Halley four days later.

Periodic Comet Hartley 2 was close to Jupiter in 1982. If, however, it manages to remain uninfluenced by the major planets, it would be well-placed for observation in 1997 and 2003.

WHAT GOES AROUND COMES AROUND-HALLEY'S

As in January, so in June, Halley's Comet sinks into our western evening sky. From most mid-northern locations the comet will be visible until the middle of July. The sun will then get into our way, and we won't see Halley's Comet for several months. When the comet emerges into our morning sky, it will be at magnitude 13, much as it was last August.

Observations from some of us who went to the Southern Hemisphere in April indicate that the comet appeared large (nearly a degree in size) with a fan-shaped short tail. While it was most easily visible to me in the skies of New Zealand in mid-April, my most memorable view was in mid-March from "up here". That was when the comet displayed a strongly-defined tail and sat suspended between the Milky Way and the predawn sky.

Although several space probes studied Halley's comet in March, detailed reports have not yet appeared. Preliminary results suggest that the nucleus of Halley's Comet is oblong, very dark, and twice the predicted size. Jets of material (geysers) appear on several parts of the nucleus too. It seems to be a more "violent" environment than expected.

The moon will be past full and rising after evening darkness by May 25. The evening sky will remain moon free until June 9. On June 14, the moon, not quite first quarter, will pass 18° north of the comet. Full moon is June 23. By June 25, the moon will be rising again after evening darkness, giving a small amount of time for observation of the comet.

Periodic Comet Halley (1982i)

Date	RA (1950)	Dec	El.	Mag.	HC+40° AT	HC+30° AT	SUN (DIS)	EARTH
05-25	10h 24.5m	-07° 41'	98°	7.2	0051 2211	0059 2124	184.0	146.1
05-30	10h 23.9m	-06° 50'	93°	7.6	0034 2217	0041 2128	190.4	161.4
06-04	10h 24.1m	-06° 12'	88°	7.9	0016 2223	0023 2132	196.8	176.6
06-09	10h 24.9m	-05° 44'	83°	8.1	2359 2228	0005 2135	203.1	191.7
06-14	10h 26.3m	-05° 24'	79°	8.4	2342 2231	2347 2137	209.3	206.5
06-19	10h 27.9m	-05° 11'	74°	8.7	2324 2234	2330 2139	215.6	221.1
06-24	10h 29.9m	-05° 03'	70°	8.9	2307 2235	2312 2140	221.7	235.5
06-29	10h 32.2m	-05° 00'	66°	9.1	2250 2235	2255 2140	227.8	249.4
07-04	10h 34.7m	-05° 00'	62°	9.3	2233 2233	2238 2140	233.7	263.1

Here are positions, elongations and magnitude estimates for Comet Halley. Also given is the comet set time (HC) and the evening astronomical twilight time (AT) for standard longitudes (75°, 90°, 105°, and 120° W.) for two latitudes. Subtract four minutes for each degree you are located east of these longitudes, or add four minutes for each degree west. Finally, I list the distance in millions of miles from the comet to the sun and from the comet to the earth.

THE CELESTIAL TOURIST SPEAKS BY: JAY REYNOLDS FREEMAN



The astronomical equipment that you can go out and buy, that is worth the most for its cost, is surely books and charts. The price of just one fancy eyepiece can stock a modest personal astronomy library! But as with eyepieces and other hardware, there is a lot of merchandise that isn't worth having. Let me tell you about some stuff that I myself turn to repeatedly.

My uses of charts fall into three distinct categories -- orientation, location, and rumination: Let's take these in turn.

I don't know the precise boundaries of all the constellations, much less the identifications of individual stars therein. So for example, if I am looking for something near Beta Leo Minor, I will probably need an elementary atlas of naked-eye stars to figure out where that is. I habitually pull out my old, weatherbeaten copy of NORTON'S STAR ATLAS, and if I lost it I might well go out and buy the most recent edition: NORTON'S is a fine work, full of useful stuff. But it's gotten expensive lately, so I might alternatively think about one of the thinner, soft-cover atlases, like Edmund Scientific's MAG 6 STAR ATLAS. (Do not confuse it with the same company's MAG 5 ATLAS, whose limiting magnitude is not faint enough to suit me.)

My atlas use at the telescope is dictated by my observing habits: I use star charts and a finder to locate things. I like my charts to show all the stars I can see through the finder. Most of them don't. The popular TIRION SKY ATLAS 2000, and its predecessor, the SKALNATE PLESO ATLAS OF THE HEAVENS, are not adequate -- even the smallish 10 X 40 finder on my Celestron 14 shows far more stars than these works do. I have no use for either the Tirion Atlas or the Skalnate Pleso Atlas in the field, except possibly as placemats for the afternoon picnic. What I do use is the AAVSO VARIABLE STAR ATLAS, whose 9.5-magnitude chart limit is just about right. The AAVSO Atlas is unwieldy: It features almost 180 separate, loose-leaf charts. It is also not cheap. But for serious deep-sky work, I find it invaluable. However, someone just starting out, or someone less zealous about faint fuzzies, would probably be satisfied with one of the others. (Indeed, most amateurs disagree with my choice of placemats -- the Tirion Atlas is in fact extremely popular.)

I sometimes like to sit indoors and browse through star charts casually. For that purpose, the "Desk Edition" of one of the smaller atlases is just fine. I have the old SKALNATE PLESO, but would recommend the Tirion today.

There are also some special charts that I use occasionally. Sky Publishing Company sells a MESSIER CARD, that handily sums up the locations and descriptions of all the Messier objects; and also offers a handy one-page moon map. There are a variety of larger and more detailed Moon maps for more serious work -- again, try Sky Publishing. If I were into Lunar observation, I would probably buy a big one, cut it into manageable pieces, and put them in plastic binder pages for field use. I can usually find planetary maps to suit me in the R. A. S. C. OBSERVER'S HANDBOOK, about which more later.

I occasionally use a simple planisphere to determine what's up at a given time. A small one will do -- I don't use it for more than determining which chart to turn to in a real atlas.

Maps and charts locate, but often I want something that describes and identifies things in more detail. In my opinion, the best observer's guide for deep-sky objects is Burnham's CELESTIAL HANDBOOK. This three-volume work has tables and lists of deep-sky stuff, constellation by constellation and furthermore provides considerable text describing the brightest and most interesting objects in each. These essays are scientifically solid, suitable for an intelligent layperson: If you read all of them, you will pick up a respectable introduction to the modern astronomy of objects outside the solar system. The CELESTIAL HANDBOOK is available in paperback, and is quite reasonably priced.

The Tirion Atlas has an associated two-volume SKY CATALOGUE 2000, which lists all the objects plotted. It has little text, but the listings are more detailed and comprehensive than Burnham's.

The Webb Society publishes several deep-sky observer's guides that are rather more advanced than Burnham. They are pretty good, but I would not recommend them as first purchases.

The Royal Astronomical Society of Canada publishes an inexpensive annual OBSERVER'S HANDBOOK, that provides month-by-month descriptions of celestial events for the current year: as well as such handy data for observers as times of the start and end of twilight, and of moonrise and moonset. The OBSERVER'S HANDBOOK is fleshed out with general tables and short articles: You won't want to throw out old ones.

Let's not forget the magazines. The ones everybody knows about are SKY AND TELESCOPE and ASTRONOMY. I read Sky and Tel regularly. Astronomy is a little too watered-down for my tastes, but that might merely be a consequence of having gotten a Ph.D. doing astrophysics. SCIENTIFIC AMERICAN also carries astronomy articles fairly regularly.

I have lots of other books and such, but those I have mentioned are the ones I use again and again.

I would like to wrap this column up by recommending some books just for reading, for those of you who might want some more scholarly education in astronomy. Unfortunately, I can't do a very good job -- I don't read the contemporary introductory books, and the ones that served me well when I was starting out are by now for the most part hopelessly outdated. Notwithstanding, Shklovskii and Sagan's INTELLIGENT LIFE IN THE UNIVERSE is a pretty good introduction to astronomy -- I believe there is a new edition recently. A current U. C. Extension correspondence course in astronomy uses Goldsmith's THE EVOLVING UNIVERSE as a text -- it assumes high-school math and science as prerequisites. It may be good, but I am too familiar with the subject to be sure. (There are dozens of beginning astronomy texts around, but the lucrative textbook market is full of junk books: Teachers and publishers know that students are for the most part too cowed to object, and too captive for complaints to be useful.)

When I myself turn to professional astronomy reference books, the general-purpose ones I most frequently grab are Allen's ASTROPHYSICAL QUANTITIES, Harwit's ASTROPHYSICAL CONCEPTS and the many volumes of the ANNUAL REVIEWS OF ASTRONOMY AND ASTROPHYSICS. These last three titles are all weighty tomes much used by full-time pros, but there are plenty of amateurs with sufficient scientific or technical backgrounds to have no fear of them.

"BLACKER THAN THE INSIDE OF A COW" BY: JOHN GLEASON



The date: April 10, 1986. The location: The Mackenzie Basin, Omarama. The Stagecoach Inn. The time: 2:45 am. High overhead: Halley's Comet, Alpha and Beta Centauri, the Coalsack, the Southern Cross, Eta Carinae. To the southwest, both the Large and Small Magellanic Clouds. To the east, the great bulk of our own Milky Way's galactic center, already more than 30 degrees above the horizon in a sky that was literally, to quote Harold Peterson, "Blacker than the inside of a cow".

I can now understand why I came to the southern hemisphere. No, it wasn't an opportunity to help escort a group of 20 people through New Zealand at a bargain rate. (Although this was the original intention). Nope, it wasn't the chance to see Halley's Comet in pollution free skies either. But the New Zealand trip did turn out to be for myself, the chance of a lifetime to discover the awesome spectacle of the southern skies. A revelation of observational astronomy after 10-years of northern hemisphere astrophotography.

Once I was told, "If you do it right, you'll see stars!" Ah....those southern stars. No book, no photograph, no star chart could prepare me for the spectacular stars, the multitude of clusters, nebulae, and the magnificent clouds of Magellan. Here was a sky pristine and new, packed with celestial wonders I had only previously read about. So here I stood, "wide-eyed" as Glen Cozens, (Feb. 1986 S & T) had suggested.

My first views of these southern wonders came from a most unusual place. After a 9:30 pm departure from Los Angeles on April 5th, our flight arrived in Honolulu some 4 hours later for a brief refueling. A quick escape by Ron Walton and myself from the aircraft found us both on an open-air passageway searching for Halley's. Of course from here no comet was seen, but there was Alpha and Beta Centauri with the Southern Cross very low on the western horizon. This will most likely be a long remembered moment, unlike one's first view through a telescope, as the local light pollution was awful along with the smell of jet exhaust! Still, it was quite exciting to see objects in the sky that I had never seen before.

Our next views of the Southern Celestial Wonders came some 2 hours later, 35,000 feet above the south pacific. Our captain had informed us that Halley's should be visible out of the left hand windows. This was really a big help since we occupied a center section seat! I was surprised that there was little interest in Halley's since there did not seem to be a mad rush to free windows to view the comet by the passengers. Both Ron and myself tried in vain to view Halley from the aircraft but were unsuccessful. In fact, no sooner had I located Scorpius, when the aircraft changed its southern heading and Scorpius, along with any chance to view Halley, disappeared toward the nose of the jet. I could only think that the first class passengers were getting one hell of a view from their privileged position in the front of the aircraft.

WHY NEW ZEALAND?

Why New Zealand? Certainly New Zealand offered some unique viewing advantages. Its extreme southern latitude (-45° from Omarama) would place Halley's Comet at the zenith during late evening hours. This also meant that the comet would be visible all night! This was going to allow us plenty of time for photography of the comet as well as photography and visual observation of the other celestial objects. The month of April finds the southern hemisphere heading into its fall season. Needless to say that we were all a little concerned about the



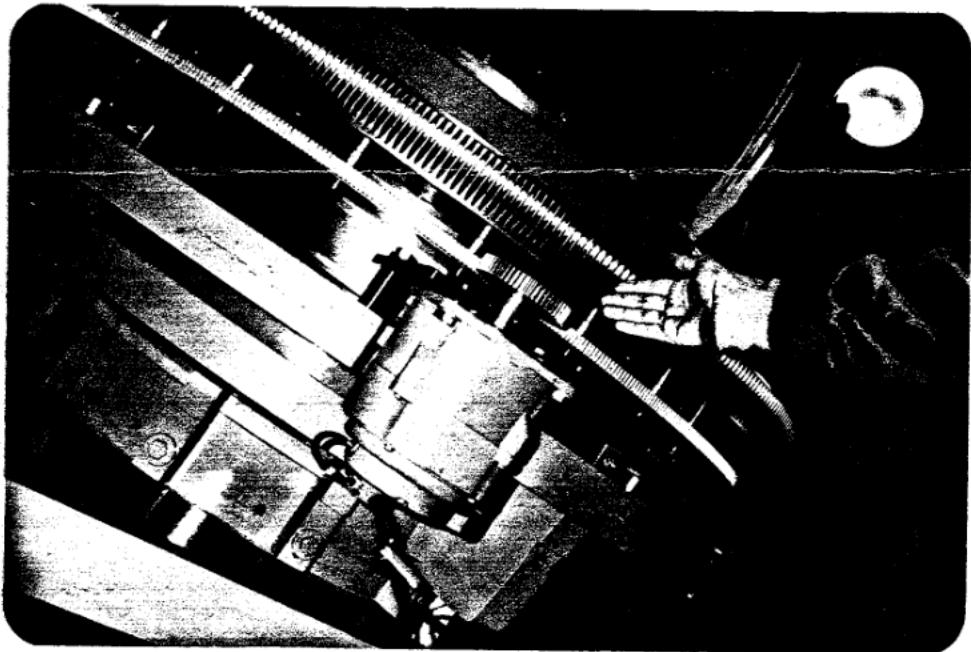
Halley's Comet Skywatch arrives in Auckland, New Zealand percentage of clear nights for this time of year. What we did end up with was a predicted 50% average of clear nights. New Zealand has such a remarkable micro-climate that the storms we did encounter ended in a matter of hours, leaving wonderfully clear, transparent evening skies. With our hectic, (to say the least) itinerary, we ended up with 4 exceptional nights of viewing and photography.

New Zealand is also a country with virtually no industrial pollution to speak of. We would travel 15 minutes out of the major cities and find skies often as dark as Fremont Peak! One such observing site was at the West Melton Observatory, just outside of Christchurch. Here a group of local amateur astronomers operate a small observatory complex not unlike that planned for Fremont Peak by the FPOA. To give you an idea of how dark it actually was, both the Large and Small Magellanic Clouds along with Halley's comet were easily visible out of the tinted bus windows on the way to the observatory site. At the West Melton observatory, we each took turns using 20x100mm telescopes to observe Halley for the first time from New Zealand. But who could be interested in Halley, when the rest of that magnificent southern sky lay beckoning. "Where was Omega Centauri?" I asked. "You are looking too far south", answered one of the local amateurs. "Just hop two stars from Beta Centauri and that's Omega." What a neck-breaker Omega turned out to be as we found ourselves turning our heads up and to the north! Most unusual was a reluctance on the part of the West Melton amateurs to turn their large telescopes on Omega. I was told that it would just look a large gray blob of light since the cluster was so large. So at West Melton we suffered with a couple of small refractors that rendered the cluster much like M22. (later views of Omega with a 22" proved the West Melton astronomers all wrong)

THE MACKENZIE BASIN AND THE HALLEY WATCH SITE

In the middle of the South Island is located New Zealand's unique high country, the Mackenzie Basin. Here we spent 3-days in the small town of Omarama. The Mackenzie Basin is distinctive in many ways - its climate, supposedly the driest location in all of New Zealand with an 80% average of clear days during April, the proximity to Mount Cook and the southern Alps, and it's also the home of world's southernmost research observatory, Mount John.

Founded in 1965, the observatory has been conducting a photographic atlas of the southern skies in collaboration with the Universities of Pennsylvania and Florida. It was here that astronomer Mike Clarke displayed for us an 8 x 10 glass plate taken of Halley in mid-March. The plate revealed Halley with multiple tails, the longest of which extended some 15-degrees. We also had an opportunity to examine the observatory's new 1-meter telescope which has planned use for photo-electric



Laura Machholz points out the worm drive assembly for the 1-meter telescope

photometry and stellar spectroscopy. This is a fine instrument, made even better with the Super-C8 guide telescope attached to it! Mike Clarke explained to me that it was currently being used as a temporary guide telescope for photographic testing of the 1-meter mirror. The 1-meter telescope also sported the largest worm gear that I have ever seen. (see photo)

Situated some 30-minutes out of the town of Omarama, was the Halley's Comet Watch site. It was here that our group had planned 3-nights of observation and photography. But logically, access to the watch site proved to be a problem. Bus service was limited as to keep stray light to a minimum. This meant that our group assigned to one particular bus and time. This would allow us only around 1½ hours at the site. People were literally herded in and out of this area like sheep. The display area and lecture hall, (hell?) turned

out to be a sheep shearing shed which had recently seen several thousand sheep during a shearing session. It was all I could do to keep from loosing my dinner from the rank smell of sheep dip!



"This way to the Watch Site"

Admittedly, the local amateurs involved in setting up the observing area, did a fine job in this respect. Here, guests had easy access to binoculars, rich field Astroscans, and Odyssey Dobsonians. There was also an area set aside for photography with 2 tracking platforms that we could attach our cameras to. The platforms turned out to be simple, German equatorial mounts with a short section of ladder attached, accommodating twelve 35mm cameras. A Watch Site staff member would handle the operation and guiding for up to 5-minute exposures. There was even an additional area set aside for private instruments. It was here we met a group of Americans from the midwestern states. They had been there nearly a month and looked pretty toasted! None of them had any astrophotos to show us. In fact, one amateur from Kansas said that he had only been able to get two shots of the comet due to various mechanical and weather troubles.

Despite some of the problems here at the Watch site, we did have an opportunity to witness the elusive and mythical Flash Aurora. After observing several flashes of light nearly due south, I got the impression that the New Zealanders were have some fun with us describing these brief flashes of light as Aurora. But not just any old aurora, but the infamous "Flash Aurora". Americans will believe anything.

We could have made arrangements to set our equipment up at the watch site, but upon arrival at our hotel, the Stagecoach Inn, we realized that it would be perfectly suitable to observe and photograph from behind the hotel. There just happened to be a grass and clay airfield behind the hotel, which by the way was located one mile out of town. Those of us interested in photography could now very easily set up our telescopes just a hundred yards from our rooms and enjoy the darkest skies that I have ever seen. The hotel staff did not seem to mind that this particular group of crazed Americans had decided to set up behind their hotel. Although I had been told that the people of New Zealand have a love affair with Americans, this did not prove to be true as we later learned from the hotel staff that they did not particularly care for Americans. Too pushy, too aloof, expecting everyone to jump at the snap of a finger. At this point I was getting the impression that the Halley Watch site out at the sheep shearing shed was some kind of a local joke that was being played upon the unsuspecting Americans. But with our arrival, these New Zealanders were faced with a group of American amateurs eager to share their knowledge and experience of the skies from right behind the hotel.

Ron Walton had done an expert job in describing the skies to the locals while I painstakingly polar aligned our equipment and proceeded with a number of lengthy exposures. Scott Litsey, who played the roll of good will ambassador in the lounge, had later told me that the locals were delighted with our group, since we were willing share some of our evenings observations with them. This was certainly evident as the hotel staff limited some of their outside lighting and allowed us to pull the drapes on the dining room and lounge areas. And I won't forget that pot of hot coffee that was sent out to us at 1 in the morning, nor the leather and sheep skin cap I ended up with after a frantic search for the price by the hotel staff in the middle of the night. To the crew of the Stagecoach Inn, a hearty thank you!

SOUTHERN CELESTIAL WONDERS

Our first nights observations behind the hotel were clouded out after only few hours observation. I had only been able to complete a rather difficult drift alignment when slowly, dark masses of clouds started drifting over the site. It was unusual to see clouds without any illumination on them. They were simply backlit by the earth's atmospheric sky glow. No light pollution here! Only a few flashes from the infamous Flash Aurora! We might have been able to get a few astrophotos in if only we had been able to start a little earlier. Although the following day we ran into heavy rain at Mount Cook, the Omarama site had remained relatively dry during the day, with the clouds clearing rapidly at sunset.

The second evenings observations, April 9th, were phenomenal. Looming in the southwest were the great Magellanic Clouds. The Large Magellanic Cloud was very high in the sky as a hazy patch of light of about 4th magnitude. Visually it appeared to extend around 8 lunar diameters across the sky. Ron Walton's 7X35 binoculars revealed dozens of clusters, condensations of stars, and the great Tarantula nebula as a small hazy patch of nebular light. Ron Quick observed the area with his Meade 8-inch Schmidt Cass. The Tarantula appeared as a smaller Orion Nebula, but with a greater amount of lighter and darker nebula boundaries. Not as impressive as I was expecting. (again, when we later used a 22-inch telescope, the Tarantula nebula stood out as the finest object that I have ever observed)

* SPECIAL NOTICE TO THE MEMBERSHIP *

MEMBERSHIP RATE CHANGE EFFECTIVE JULY 1

MEMBERSHIP ONLY: \$10 (INCLUDES EPHEMERIS)

MEMBERSHIP AND SKY & TELESCOPE: \$24

JUNIOR MEMBERSHIP (UNDER 18): \$17

Please disregard rates listed in the field of view article.--ed.

20° west of the LMC, the Small Magellanic Cloud appeared as a much fainter patch of light as compared to the LMC. Binoculars resolved the SMC much as binoculars would resolve parts of the northern Milky Way. Located just a few degrees from the SMC is the great globular cluster 47 Tucanae. It was easily visible to the naked eye as a bright star. Much easier than M13. This was probably due to its easily identifiable location next to the SMC as well as the sparseness of brighter stars near the cluster. Visually, 47 Tucanae is remarkable, showing a beautiful symmetrical core of stars from its center to its outer edge. With the exception of Omega Centauri, it rivals any other cluster that I have seen. Even my old favorite M22 has to take a back seat to this one. Robert Burnham Jr., in his Celestial Handbook, states that "This is a magnificent globular star cluster, usually regarded as the finest in the heavens with the single exception of the great Omega Centauri....In larger instruments the cluster becomes a shimmering globe of thousands of star points, crowding toward a rich central blaze." I could not have said it better myself.

Almost due west the great constellation of Orion was setting. Actually the great hunter was taking a nose dive into the horizon. It was fascinating to follow the winter Milky Way, (which would normally be below the California horizon) up past Sirius, up overhead to the False Cross, through Carina, the Southern Cross at the zenith, across the Coalsack, Beta and Alpha Centauri, down through Centarus, past Halley's to Scorpius which was rising on its back directly on the eastern horizon. Wow, what a spectacle! How am I ever going to go back to Fremont Peak after seeing this?

Clearly the most interesting feature of the Southern Milky Way to me was the 7° X 5° hole called the Coalsack. It is truly a dark void, flanked by the kite shaped Southern Cross. A faint star was visible within the Coalsack without optical aid. Star charts and catalogues list this star at around 7th magnitude. Don Machholz felt that it must have been much brighter than this since it was so easily visible. Unless this star is variable, I have reason to believe that maybe this star is so easily visible because there is such a contrast between it and the blackness of the Coalsack itself.

I happened upon a beautiful multiple star system quite by accident while focusing on a guide star for photography. The star chosen was the base of the Southern Cross known as Alpha Crucis. What I thought was a triple star system, I had later learned was actually a double star with the fainter third star presenting an apparent triple star system. An interesting object just east of the Southern Cross is the famous Jewel Box open cluster. We had observed this cluster with a 10-inch f/5 telescope from the Watch Site. It was not as impressive as I had expected. This observation was probably due to the high cirrus clouds that we encountered that evening. Unfortunately I did not get another look at the cluster during the rest of the trip.

Another fine multiple star system is Alpha Centauri. Alpha is actually another triple star system but only it's close companion was seen through the 4-inch guidescope. I did not attempt to search for the 11th magnitude red dwarf Proxima Centauri. At the Zenith, both Alpha and Beta Centauri blazed away acting as the famous pointer stars to the Southern Cross. You can use Beta to find your way to another interesting object too.

AT 100X, using a Meade 8-inch Schmidt Cass., Omega Centauri completely filled the telescopes field of view. What we saw was a great elliptical mass of stars. Billions of stars. Stars everywhere! What is instantly striking about Omega was the sharpness of the stars. They were visually tiny, needle points of light unlike the somewhat enlarged stars we're used to seeing in the likes of M13. Image scale has a lot to do with this effect due to the size of Omega. It has an apparent visual diameter nearly 30-minutes of arc! Take a look at the photograph on page 563, Vol. I of Burnham's Celestial Handbook. That's what we observed through the 8-inch!

North of Omega lies the great radio galaxy, NGC 5128. Also known as Centaurus A, this giant elliptical galaxy was viewed through the 8-inch Meade as a large diffuse ball of gas, cut in half by a striking dark band. From our vantage point, the dark band of material actually exhibited an unusual amount of structure and detail, appearing at times of steady seeing, to be split into two equal parts, while the diffuse cloud of the galaxy appeared as a pale blue against a star-studded background.

HALLEY'S COMET OVER OMARAMA, APRIL 8, 9, 10

Sooner or later our attention was finally called to Comet Halley. Now on its way through Lepus towards Centaurus, the comet appeared as a large, fuzzy ball about 1° in diameter with a fan-shaped tail, just skirting along the north boundaries of the Milky Way. The tail itself was most unusual. Where was it? What has happened here? From March 5th thru the 20th we had observed Halley from Fremont Peak with a fine 7° tail below the Milky Way. Now we were only observing an enlarged coma with a 1° fan like tail.

The local amateurs at the West Melton observatory told us that the tail had been lost in the "busy" sky background due to its proximity to the Milky Way. "It will get better as it leaves the Milky Way" they said. But even now a few days later in the dark skies of Omarama, the comet's tail remained a short 1°. Don Machholz and I agreed that this was most likely due to the earth/comet positional geometry. With the comet closest to the earth, we were now observing into the nose of the comet. The dust tail was probably extending out behind the coma, out of our line of sight. Indeed, a few weeks later during the total lunar eclipse, Ron Walton reported that the tail had once again appeared as nearly 6° degrees in length. As the comet had passed by the earth on its outbound journey, our point of view allowed us to see past the comet's coma, down along the tail. Astronomer's at the Auckland Observatory told us that the positional geometry theory was incorrect, and that the comet had at one point detached its tail, and was only very slowly growing one back.

Regardless of what had actually happened, I do not think that anyone of us were disappointed in Halley. Its position in the sky in relation to the rest of the Southern Milky Way will never be forgotten by any of us. Interestingly, everywhere we went to in New Zealand, we had been asked if we were disappointed in Halley. And every time the group responded with a resounding NO!

TWIZEL'S REVENGE STRIKES THE HALLEY'S COMET SKY WATCH!

The last night at Omarama, April 10th, nearly ended in disaster for several members of the sky watch. By days end, Ron Walton was rendered incapacitated by sudden chills and nausea. 4-hours later I came down with the same symptoms while at the same time trying desperately to complete our astrophotography. I will spare the details of the 6-hours that followed and will only say that it must have been that pickled eel or the "catch-of-the-day" we had for lunch. A third tour member had also suffered the same symptoms. This was one night that we would all like to forget.

SOLITAIRE LODGE, LAKE TARAWERA, ROTORUA

Fortunately we had the next 4 days to recover from our illness. As it turned out everyone of these nights either suffered from clouds or a city location. No observations were done during this period until the group arrived on the North Island of New Zealand.

The town of Rotorua is famous for its thermal activity. It seems that everyone living here have their own personal fumarole and hot mineral bath in their backyard. The air in this town is also heavily saturated with sulfur dioxide. This place really stinks!

Scott Litsey had accidentally ran into Reg Turner, owner of the Solitaire Lodge at a local 1-hour photo. Reg was also conducting a Halley's Comet Skywatch out at his lodge on Lake Tarawera. He was so impressed with Scott's photography that he invited Scott to come out to the lodge later that evening with a few of the tour members. When Scott had told me about it I was a bit dubious about the whole affair. I was mentally picturing a large hotel with lights everywhere and telescopes set up on a patio. "Well, we could just go and check out the action" I thought. After all, we had been told that there was also a 22-inch reflector available. We could finally observe some of these deep sky objects with a telescope of substantial size. With the exception of Ron Walton and Myself, no one else from the tour was interested in the drive out to the lodge. Once again our busy itinerary had us running around Rotorua since 8 am. As an after thought, I had decided to bring all of our photographic equipment, including the tracking platform. Even though it was already fully disassembled, we just might be able to get in one or two shots of the comet if the site is good enough. So the three of us piled into a taxi and headed out the lake.

30-minutes later, the unique environment of Solitaire Lodge was evident from the moment that we entered the driveway. Here was a beautifully appointed, personally hosted lodge sitting in a paradise of nature. The owner, Reg Turner immediately welcomed us into these plush surroundings as I sank 2-inches into the carpet. After a brief introduction to the lodge guests, and a sharing of astrophotography, Reg led us out to the backyard helicopter pad, indicating that this would be an ideal spot to do astrophotography from. It took Ron and I a few minutes to get our jaws off the ground when we once again saw the Milky Way overhead in a jet black sky. Halley's had already changed, as its tail seemed to have grown a few degrees longer since we had last observed it.

Reg had even provided his guests with a resident amateur astronomer in the form of Graham Lofftus. Graham turned out to be the John Dobson of New Zealand as he proceeded to show us a 2-page list of telescopes and mirrors he had made in his lifetime. He was responsible for the 22-inch that was probably the largest amateur telescope in use on the north island. Graham had been spending the last month entertaining guests that only had a casual interest in the sky. Then along we come with a hungry appetite to use the 22. Of course he was absolutely delighted.

After reassembling my tracking platform, and performing a not-so-critical polar alignment, we began what turned out to be 11 pairs of astrophotographs. Not the 1 or 2 that I only thought possible earlier. The proximity to the lake caused a real problem of dewing lenses. But this did not turn out to be a problem as Graham quickly found a hair dryer for us. Half way through the exposures we paused to use the 22-inch Newtonian.

THE TARANTULA NEBULA

I almost fell off the ladder. Yep, after a lifetime of observing, nothing could compare to this view through the 22. Here was an object well suited to the large aperture of this telescope. There were countless stars imbedded in a nebular complex of violent proportions. Imagine if you can a Tarantula walking towards you with jaws open and 8-eyes, (imbedded stars) ablaze. The loops, turns, and bends in the nebulae are unlike anything in the sky.

47 TUCANAE

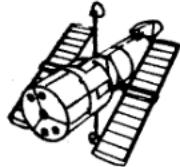
Through the 22-inch, this cluster rivals Omega in awesome beauty. It was a radiant symetrical ball of thousands of individual stellar points. Pale blue at its center, it was resolved from its core out to 15th magnitude stars along its outer boundaries. Incredible!

OMEGA CENTAURI

Awesome, totally awesome. Need I say more? Is this why I became ill for the next three weeks?

SPACE PROGRAM UPDADE BY: DON FINGERHUT

NASA'S LAUNCHER PROBLEMS CONTINUE



Since the loss of the Challenger, two launches of the expendable boosters have been attempted and resulted in failure. A Titan 34D exploded 8.5 seconds after launch on April 18th. The booster was carrying a Big Bird reconnaissance satellite. The cause was a failure in one of the strap-on solid boosters. A seal failure in a joint, like the one on the shuttle is not considered a possible cause. A debonding of case insulation or a crack in the propellant are more likely causes.

A Delta booster shut down 71 seconds after liftoff on May 3rd, causing the loss of a GOES weather satellite. The cause was low battery voltage needed to hold fuel valves open. A short is suspected of causing the reduction in battery voltage. The only other booster in the U.S.'s stable is the Atlas Centaur. An Atlas was scheduled to launch a military communications satellite on May 22nd. That launch has been postponed at least 4-weeks while the other failures are studied. Two other Delta's and an Atlas were scheduled for launch in 1986. Look for a delay of 6 to 8 months before Titan and Delta launches resume.

SHUTTLE INVESTIGATION REPORT IS DUE JUNE 6TH

The cause of the loss of the Challenger has definitely been traced to a leaky seal in the right hand solid rocket booster. The investigation panel's report will recommend redesign of the joint and changes to the way NASA checks out and operates the shuttle system. If the solid booster is the only component to undergo major redesign, the shuttle could be flying again by July 1987. If the investigation into the rest of the shuttle system recommends major changes, the delay could be until 1988 or longer.

CHALLENGER REPLACEMENT RECOMMENDATIONS

NASA, the Air Force, and the White House Senior Interagency Group for Space, have all recommended building a replacement orbiter and more expendable boosters. The undecided issues are how to fund the replacement orbiter or to move all commercial satellites off of the shuttle. Funding options include appropriating additional funds (approx. \$3 billion), cutting the rest of the NASA budget to get the money, and private funding with lease back to NASA.

GIOTTO IMAGES THE NUCLEUS OF HALLEY'S COMET

A photograph taken from about 18,000 Km showed the potato shaped nucleus to be about 14 Km long. The side away from the sun is blacker than coal, and on the sun lit side, jets of dust and gas can be seen shooting from the surface. The European Space Agency has retargeted Giotto for a 1990 Earth flyby for possible retargeting to another comet. The Soviet union is considering retargeting one of its Halley flyby spacecraft (Vega 2), for a flyby of the asteroid Adonis in 1987.

SOVIET UNION ORBITS NEW SPACE STATION

The modular space station, called Mir, was launched Feb. 19th. The first two man crew was launched toward the station on March 13th. The Soviets say that Mir will be used for long-duration activities and that add-on modules will be launched to expand the facility. The Mir/Soyuz was maneuvered near the old Salyut 7 space station and the cosmonauts transferred over in the Soyuz on May 6th. The purpose may be to retrieve a French cometary dust collector mounted on the Salyut 7 or to check out and transfer the Cosmos 1686 module which is attached to the Salyut 7.

LATE COMET MACHHOLZ POSITION UPDATE

Additional information is available on the Sky and Telescope Hotline. (617) 497-4168

COMET MACHHOLZ, 1986e EPHEMERIS

DATE	RA	DEC.	MAG.
JUNE 1	21h 7.5m	+44° 42'	
JUNE 5	19h 37.0m	+41° 33'	11.6
JUNE 7	19h 37.0m	+39° 09'	
JUNE 9	19h 10.2m	+36° 19'	11.9
JUNE 11	18h 46.1m	+35° 12'	
JUNE 13	18h 24.7m	+28° 55'	11.9
JUNE 15	18h 05.0m	+26° 38'	
JUNE 17	17h 49.7m	+23° 26'	12.7
JUNE 19	17h 35.5m	+20° 23'	12.9

SJAA MEETING AND STAR PARTY LOCATIONS

GENERAL MEETINGS

Once a month the SJAA holds a General Meeting at the Los Gatos Red Cross building in Los Gatos California. The large meeting room has kitchen facilities and large slide projection screen. This is also the location for the SJAA's "Indoor Star Parties", informal sessions where members gather to share their astronomical interests. Whatever your interest, astrophotography, deep sky observation, telescope making, or just arm chair observing, you'll find a friendly atmosphere at all of our meetings.

The Red Cross building is located at 18011 Los Gatos-Saratoga Rd. From Hwy 17 take the Hwy 9 (Saratoga) exit and continue west up the Los Gatos-Saratoga road for about 1.5 miles. Turn right at Rose Ave. Then turn right immediately into the parking lot of the Red Cross building. Doors open at 7:45 PM, with General meetings beginning at 8 PM. General Meetings are held on the 4th saturday of each month.

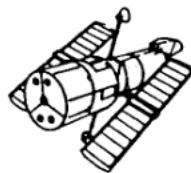
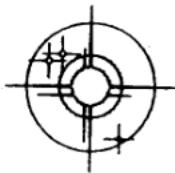
HENRY COE STATE PARK

Take Hwy 101 south towards Morgan Hill and take the East Dunne exit. Continue east towards the hills (around and past Anderson Reservoir) for about 12 miles to the park. Past the park entrance you will see old ranch type buildings on the right and a horse trough. The gate (on the left) is locked but the club combination is 4565. Always lock the gate after yourself. If arriving after dark, please park outside the gate and hike in first to find an observing site before dark, please. Just a short distance up a hill beyond the gate is where the SJAA sets up equipment.

FREMONT PEAK STATE PARK

Take Hwy 101 south towards Salinas. Then take Hwy 156 east (San Juan Bautista exit) for two miles to a yellow flashing light. Turn right and go about 1/4 mile to where the road reaches a "Y". Stay left for about 25 yards and then go right. (Watch closely for the Fremont Peak sign) Follow the canyon road for about 11 miles up into the park. The SJAA set up at Coulter Camp. It's visible on your right as you drive up onto the main area of the park. There is usually some astronomical activity here every clear new moon weekend. Fremont Peak stands 3000 ft above sea level. Arrive early if you are setting up equipment. 30 to 40 telescopes are not uncommon at Fremont Peak.

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SAN JOSE ASTRONOMICAL ASSOCIATION MEMBERSHIP APPLICATION

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MEMBERSHIP/S&T: \$ 24.00

JUNIOR (UNDER 18): \$ 17.00

Name _____

Questionnaire (optional)

Address _____

Telephone (____) _____

What are your astronomical interests (e.g. astrophotography, deep-sky observation, telescope making, etc.)? _____

Please bring this form to any SJAA meeting, or send to:

Jack Peterson, Treas.
San Jose Astronomical Association
1840 Yosemite Dr.
Milpitas, CA. 95035

[Phone: (408) 262-1457]

Please check type of membership and if new or renewal.

Membership Only _____ Membership/S&T _____

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Do you own a telescope? _____ If so, what kind?

Is there any specific area of astronomy that you feel qualified to help others with? _____

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