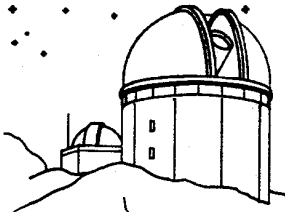
EPHEMERIS

OF THE SAN JOSE ASTRONOMICAL ASSOCIATION



OCTOBER 1985

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*        **** OCTOBER 5TH ****          *
*      DR. JACK MARLING PRESENTS:       *
*       OBSERVING FROM MAUNA KEA        *
*                8PM                    *
*                                       *
*        **** NOVEMBER 2ND ****         *
*    SPACE TELESCOPE PROGRESS REPORT    *
*                8PM                    *
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OCTOBER 5 GENERAL MEETING AT THE LOS GATOS RED CROSS BUILDING. DR. JACK MARLING OF LUMICON WILL PRESENT A TALK ON OBSERVING FROM HAWAII'S MAUNA KEA OBSERVATORY. DON'T MISS THIS INTERESTING PRESENTATION!

OCTOBER 12 STAR PARTY AT FREMONT PEAK STATE PARK. DUSK TILL DAWN.

OCTOBER 19 STAR PARTY AT GRANT RANCH COUNTY PARK. DUSK TILL DAWN.

OCTOBER 26 INDOOR STAR PARTY AND BOARD MEETING AT THE LOS GATOS RED CROSS BUILDING. 8 PM

NOVEMBER 2 GENERAL MEETING AT THE LOS GATOS RED CROSS BUILDING. THERE WILL BE A LOCKHEED ENGINEERING UPDATE ON THE HUBBLE SPACE TELESCOPE THAT IS CURRENTLY BEING ASSEMBLED IN SUNNYVALE. 8 PM.

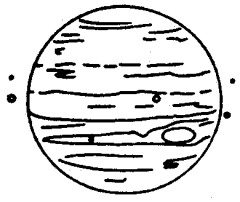
NOVEMBER 9 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION (FEAO) DUSK TILL DAWN AT HENRY COE STATE PARK (DIRECTIONS INSIDE)

NOVEMBER 16 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION TO BE HELD AT GRANT RANCH COUNTY PARK (WEATHER PERMITTING) UPPER AND LOWER SITES. DUSK TILL DAWN.

NOVEMBER 23 BOARD MEETING, 8 PM AT CHRIS AND SHEA PRATT'S NEW HOME.

CALICO OBSERVATORY
BY: JIM VAN NULAND

GREAT RED SPOT



Jupiter is looking better recently, as reported by Gerry Rattley and Paul Maxson, and also Rich Watkins and Bob Rea. There is a little more color in the Spot; Gerry described it as having a reddish copper or metallic rust color. Paul points out that the outer (southern) edge is quite prominent, making the Spot very easy to find. Paul's photo shows the Spot brighter than the (light) zone to the south. It's not like years ago with a brick-red Spot, but it is nice. Paul and Gerry find that powers of 100 to 150 are best, though I prefer 200 or more. But this is a personal thing, and also dependent on conditions, so try various power and decide for yourself.

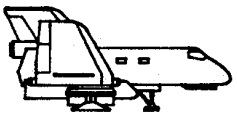
The Spot's position has been stable, and this month's predictions continue without adjustment. By year end, Jupiter will be too low in the west to observe well, though it will be detectable during twilight through January, 1986. This column will suspend after December, to resume in May or June, whenever I recover the Spot.

Observation of satellite disks requires some care. If Airy disks (also called "spurious" disks" is what you like, by all means use a very small telescope! But the intent of last month's discussion was "real" disks. Next time a 5th-magnitude star comes close enough, I will try various apertures to determine what is needed to clearly tell the star from the moons.

Great Red Spot on Meridian PDT/PST

da	mo	d	h	m		da	mo	d	h	m	
M	9	30	7	9	pm	Sa	10	19	7	51	pm
W	10	2	8	50	pm	M	10	21	9	35	pm
F	10	4	10	31	pm	Th	10	24	7	10	pm
M	10	7	0	6	am	Sa	10	26	8	44	pm
M	10	7	8	0	pm	M	10	28	9	27	pm
W	10	9	9	41	pm	Th	10	31	6	51	pm
F	10	11	11	19	pm	Sa	11	2	8	31	pm
Sa	10	12	7	9	pm	Tu	11	5	5	59	pm
M	10	14	8	47	pm	Th	11	7	7	43	pm
W	10	16	10	22	pm	Su	11	10	5	14	pm

SPACE PROGRAM UPDATE
BY: BOB FINGERHUT



LESAT REPAIRED ON SHUTTLE FLIGHT 51-I

The shuttle orbiter Discovery was launched on 27 Aug. The astronauts accomplished their mission of deploying three communication satellites and repairing one that was launched last April. Discovery returned to a pre-dawn landing on 3 Sept at Edwards AFB. The dead satellite, Leasat F3, was repaired during two days of space walks. A failed sequencer was bypassed allowing around controllers to regain control of the satellite. It will be two months before the Least's booster motor is warmed enough to risk firing it. If the propellant was cracked by freezing the motor will explode. The shuttle was launched with improved heat sensors to prevent the engine loss problem which occured on the last flight. An early problem occured, in which the shuttle robot arm and a satellite clam shell enclosure door were damaged. The result was that the Austrailian satellite, Aussat-1, had to be deployed early and on the same day as the american ASC-1 satellite. The Leasat F4 was also deployed. The damage to the robot arm hampered the Leasat F3 repair by making each motion a separate manual operation. Normally complicated motions are made with an automatic controller.

SPACELAB 2 PRELIMINARY RESULTS

Initial fears that heat had caused fogging of film used to take ultraviolet pictures of the sun has been dispelled. some fogging did occur on the end of rolls but the majority of the thousands of unique solar images provide clear views of the sun. The soda can competition was won by Coke. The Coke cans dispensed carbonated beverages better than the Pepsi cans. The lowest level of carbonation worked best. Higher levels were described as "frothy, with a slight metallic taste". None of the cans were refrigerated so "there was no desire to drain the cans" according to mission commander Gordon Fullerton.

JAPANESE HALLEY'S COMET SATELLITE LAUNCHED

The Planet-A was launched 19 Aug. on a Nissan Motors Mu-35-2 launch vehicle. The satellite, named Suisei, (meaning comet) will fly past halley on 8 march 1986 at a distance of 130,000 miles.

JAPANESE SHUTTLE BEING STUDIED

A feasibility study will be conducted in 1986, to be followed by a 6-7 year concept study. A 9000 Kg manned or unmanned vehicle which would be launched on an H-2 vehicle is envisioned.

ATLANTIS SCHEDULED FOR OCT. 3 LAUNCH

A flight readiness firing of the three main engines was conducted on Sept. 12. All went well. Mission 51-J will carry a department of defense payload on Atlantis' first mission on Oct. 3.

Challenger is scheduled to carry the German Spacelab A-1 payload on mission 61-A on Oct. 30.

Columbia is scheduled to fly mission 61-C on 20 Dec. with two communications satellites and Materials Science Laboratory MSL-2.

Shuttle landings at Kennedy Space Center may begin again in Jan. or Feb. when orbiters are fitted with improved nose-gear steering capability.

GROUND BREAKING FOR 400-INCH TELESCOPE

Ground breaking for the 400-inch telescope is scheduled for Sept. on top of Mauna Kea in Hawaii. The telescope will have 36 individually controlled hexagonal mirror segments.

ARIANE LAUNCH ON SEPT. 12 FAILS

The 15th mission of Europe's Ariane was scheduled to launch two communication satellites. The booster was destructed after the engine failed during third stage flight.

FIRST TITAN 3 BOOSTER FAILURE

The launch of a military reconaissance satellite from Vandenberg AFB on 28 Aug. was a failure. It was the first failure of a Titan 3 booster in 18 years.

FIRST VANDENBERG SHUTTLE PAYLOAD DECLASSIFIED

The payload for the 20 march 1986 launch has been announced as the TEAL RUBY satellite to detect aircraft from space and the SDI Cirris infrared telescope to obtain atmospheric spectral data.

ICE EXPLORES COMET GIACOBINI-ZINNER

The International Cometary Explorer flew by comet Giacobini-Zinner early in the morning of 11 Sept. The spacecraft survived passage through the tail to return data about the particles and fields it encountered.

FIELD OF VIEW
BY: JOHN GLEASON

THE SUMMER OF 85'

The Pleiades are already rising before midnight, announcing the coming of winter and its celestial wonders. At Fremont Peak, there's already a chill in the air, meaning colder nights ahead. Time to break out the winter woolies.

And so ends the summer of 1985. An eventfull summer observing season that began last April. April,1985 will be long remembered for its 80° star parties and clear nights. Normally April is a rather soggy month at the Peak, but record breaking temperatures allowed most of us to observe and photograph many of the springtime galaxies overhead. I came away with an entire portfolio of galaxies, some of which I had never seen before. The fine weather also gave Bob Fingerhut an opportunity to run a performance check on his recently completed 16-inch f/4.6 Newtonian reflector. And perform it did, as the telescope provided views unequaled to only by photographs. Needless to say, Bob was quite pleased.

May found many of us making our annual pilgramage to Big Bear Lake for the Riverside Telescope Makers Conference. As usuall, many unique telescopes were on display along with their unique owners. There was the "Hiss" driven telescope, and Ed Byers displayed his new equitorial mounting. Ed jumped on my case after I questioned the backlash in the gearing. Sorry Ed, I didn't mean any harm, but it would have been nice,if you had attached a telescope to the mount that we could have looked through! Maybe it wouldn't have mattered since the seeing conditions rated a -10 on the "looking through the bottom of a fish bowl" scale. (FBS) There was also a nicely built observatory on the site this year. A neat two domed structure that housed a C14 and Meade 10-inch reflector. (more on observatory projects later) On the last day of the conference, our own Don Machholz discovered his second comet, after a grueling 1700 hours of searching. Then there was the SCOPE CITY fiasco. Seems that the Scope City people bought up all the Celestron goodies before the conference started. They then turned around and jacked the price up another 50%! Oh those Capitalist's! But this unfortunate event later turned into the FPOA's windfall, as Celestron donated nearly a truckfull of telescopes to benefit the 30" observatory project at Fremont Peak.

Yosemite's Glacier Point was the setting for a phenomenal new moon weekend in June. Who could forget seeing details in Jupiter's Great Red Spot with the planet only 5 minutes above the eastern horizion! And, those 1200X views of Jupiter's moons as seen through my "superior" C8 left passers-by speechless! Later that weekend, the blown head gasket in my Toyota had left me speechless. As it turned out,the SJAA enjoyed the finest viewing of all the scheduled weekends at the Point this summer. Logistical problems in the park spoiled an otherwise perfect weekend. Next summer don't be surprised if we are limited to a maximum of 30 people, with 1 telescope for every 2 occupants per car.

The SJAA gets its tax-exempt status!!!!!!!!!!! After 30 years, the SJAA was finally granted tax-free status, which means that your donations are now tax deductable. (notice that this months bulletin was mailed under the non-profit organization status.)

Don Machholz received the Tuthill comet award at this years July picnic in Grant Ranch Park. Rodger W. Tuthill awards $200 and a plaque to american amateur's who discover comets. Jack Zeiders received the A.B. Gregory award for outstanding service to the SJAA and the community at large. Jack has been an active member of the SJAA for more than 10 years and has assisted a lot of beginners get acquainted with the SJAA. Jack is currently trying to get an introductory astronomy program going at the Red Cross meetings. You can usually find him at the general meetings and the indoor star parties. Jack tells me that is is ready to get started with his introductory astronomy program, so come on out to the indoor star party meetings at the Red Cross building.

100 telescopes gone and $17000 richer, the Fremont Peak Observatory Associations August telescope sale was an unexpected success. Nearly 90% of the Celestron donation disappeared in less than 3 hours of fanatic buying at Fremont Peak State Park. All proceeds of the sale will be going into the observatory building and 30-inch telescope project. The FPOA chose to have the sale at the Peak in order to popularize the location of the observatory at the park.

September 1985 - cold and wet weather at the peak. Where did our summer go?

This was one of the most memorable summer observing seasons that I can recall. Ahead, Halley's awaits in the pre-dawn sky. Although still around 14-15th magnitude, many of the large telescope owners in our association should be getting their first look this month. (weather permitting of course) Perhaps the fact that we are in a solar minimum, is the reason for Halley's dimness?

MONSTER STAR PARTY AT FREMONT PEAK
or: NIGHT OF THE COMET

Hundreds of astronomy enthusiast's converged upon Fremont Peak state park on September 14th for the combined AANC conference and star party. For many of us this weekend would be the first time that we would see comet Halley. The comet would be well positioned in the east at 3 a.m. in the constellation Orion.

By 3 p.m. Coulter Camp was already filling up with cars and telescopes. By 6 p.m. the place was a mad house of people milling about, and cars parked everywhere. I did a quick attendance count, and stopped at 400. Both the upper and lower parking lots were full and people started parking along the entrance road leading into the park. In 10 years of going to the "Peak" I have never seen so many people before. Still, there were a lot of familiar faces missing from the crowd. I imagine that a lot of observers stayed away anticipating a large group.

The AANC gave away a number of door prizes. Books on Halley's, a flexible star chart that could also double as a Frisbee, A 5-inch reflector telescope, and a nights observing with the 30-inch telescope were donations from the FPOA.

Kevin Medlock brought down his 18-inch Newtonian telescope. We hadn't seen this telescope for nearly 3 years since the polishing accident. I did not get a chance to look through it that evening, but good reports filtered over to me from observers. Now I wonder if Kevin would trade a Questar for it?

Frank Dibbell reports seeing Stefan's Quintet through his 3.5-inch fluorite refractor. He claims that the observations were confermed by Jay Freeman, Bob Fingerhut and a host of others. An informant tells me of witnessing several pay-offs by Frank to these people! California Cooler's do wonders for night vision Frank! (More about this in next months CELESTIAL TOURIST)

At 3 a.m. I found myself searching for Halley with my superior C-8. All reports from Friday night indicated that the comet was about 14th magnitude. The charts in Sky and Telescope were of great assistance in locating the field stars around the comet, but no comet was found. Later, a nearby 12.5-inch rendered an extremely faint fuzzy nothing positioned between two stars. The sighting was confermed that morning, as Kevin Medlock described the same view through his 18.

The view of Halley's was complicated by the fact that there was also a faint star next to the nucleus, rendering the possibility that the object in view was just a faint double star. I tried to get a photo of the comet with my 5.5-inch Schmidt camera, but the 10 min exposure on Ektachrome 400 failed to record the image. Steve Mandel was more successful on Friday night, as he was able to record Halley's and Giacobini-Zinner together on hypered 2415 through an 8-inch Schmidt camera. One of the problems I believe I had with the 5.5-inch was that I used the roll film holder for the first time, which obstructs nearly 50% of the camera's aperture. The camera, normally running at f/1.65, was probably slowed down to about f/3. It has been 4 years since I have used the Schmidt camera. Even though it failed to capture Halley, I was pleased to see razor sharp star images across the entire field of view. Four years ago I had sent it down to Celestron for a focus adjustment, and had never tested it!

The morning of September 15th will be long remembered by many of us as the night we first saw Halley's Comet. As the comet's distances from the sun decreases, it should become less of a challenge for smaller telescopes this month.

SJAA OBSERVATORY FUND

Yes folks, in case you forgot, the SJAA has its own observatory fund too. With all this FPOA talk it kind of got overlooked. As of August 31st there was $2600 setting in an interest bearing account. Infact there is more interest going into the fund than there are donations. The time has come for the SJAA to ask some pretty serious questions. What to do with the fund? Is it still necessary for the SJAA to persue a permanent site location in the local foothills of Grant Ranch County Park? Should the SJAA go in with the FPOA and establish a permanent observatory at Fremont Peak? Maybe we don't need a permanent site after all. Most of our members transport their telescopes to Coe or to the Peak in quest for dark skies. Perhaps we should purchase a few telescopes to loan out to members. All of these questions and more are being asked by the SJAA board of directors. Don't be surprised if you get a friendly phone call from one of them to get your opinion. You may even be asked to fill out a questionnaire at one of the next general meetings. It is not that the money is burning a hole in anyones pocket. It's just that projects like this stand a chance of greater success if there is a particular goal and objective in mind. (witness the FPOA's success) Set a goal and work towards it. The poet once said; "If you do it right, you'll see stars"

EQUIPMENT ADMINISTRATOR

The SJAA has several telescopes that it loans out to members for a month's or so. A problem that has plagued us in the past is accounting for this equipment once it is checked out. The clubs 12.5" seems to be missing. If you have any of the SJAA's equipment, please contact Bob Fingerhut. Tom Ahl has accepted the position of Equipment Administrator. Once all of the telescopes are gathered together again, Tom will be the contact for use of the clubs equipment, and will be keeping tabs on things.

SPACE INTEREST MOVEMENT DIRECTORY

Trudy Bell has put together a comprehensive directory of all the american space interest groups with nationwide activities. The text of the report describes the major developements in the space interest movement from 1980 to 1985, concentrating on the advances over the past two years. The author, Trudy E. Bell is a Senior Associate Editor of IEEE Spectrum, specializing in communications and space technology. Her background includes seven years on the editorial board of Scientific American magazine and an A.M. from New York University in the history of science. She has also written reports on contract to NASA and to the Office of Technology Assessment. (also a former member of the SJAA, current bulletin subscriber - ED) Calculated at $20 per copy, send check to Trudy E. Bell, Science Writer and Editor, 11 Riverside Dr. #15GW, New York, N.Y. 10023.

OBSERVING AT MAUNA KEA

Don't forget that Jack Marling will be giving a talk on Oct 5th. His topic will be centered around observations of Planetary Nebula he made with the Air Force 24-inch telescope in Hawaii. Many of you have probably been reading Jack's accounts of observing some of the lesser known planetaries in the Ephemeris. This is leading to a book on planetaries that Jack will be publishing in the near future.

EQUIPMENT NIGHT

I have told this story before, but I can remember 100 people showing up to equipment and slide nights in eager anticipation of recent astrophotography and the latest developments in equipment. This was once considered by many members to be one of the most important meetings to attend. But even though the attendance fell far short of 100, those members who did attend the September 7th slide and equipment night were treated to an excellent presentation on the Fremont Peak Observatory Association by Kevin Medlock, and a fine display of telescope equipment from Bob Fingerhut, Jack Peterson, Jay Freeman, Kevin Medlock, and Gene Cisneros. I did not catch the name of the member who also brought in a nice 8-inch newtonian on a pipe mount.

Bob described his 16-inch newtonian at length. Jack Peterson told us about the Takahashi camera tracking platform he purchased for taking pictures of comet Halley. The compact german equitorial mount fits into a small vinyl pouch for easy transportation, and is powered by 6 "D" size batteries. It even includes a small guidescope and polaris finderscope. The challenge will be to use the polaris finderscope in the southern hemisphere! All in all a nice unit, but a bit expensive at $500.

Jay Freeman brought his 4-inch altazmuth refractor. (described in this months Ephemeris) Jay says the optics are excellent, even though there were some minor problems with the mount and tripod.

Kevin Medlock displayed a 4-inch fluorite refractor, describing to all the difficulties in making a fluorite crystal for these telescopes. Seems that 6-inch fluorites are rare and expensive, running above $1000 an inch in price. Kevin also told us about the potential of "acid dew" damage to telescope coatings, especially mirrors. Mirrors and lenses with special coatings have been known to be pitted badly if left wet for a length of time. Don't cover telescopes up right away when you bring them in from the cold air. Let them dry out before putting on the dust caps.

A vintage 60's Tinsley mounting was the center attraction of a astrographic system brought by Gene Cisneros. The system consisted of an 8-inch Schmidt camera, C-90 guidescope, and a 135mm f/1.8 telephoto mounted piggyback. Gene went on to explain the workings of the Schmidt camera and told us that all of the equipment came from various club members. The mount from Joe Sunseri, guide scope from Bruno Bennasi, and the tripod from Bruce De Graff.

Mr. Video was there too. Mr. Video hopes to tape future SJAA events and present them in a television version of the Ephemeris called: The SJAA Video Magazine. It will feature highlights from general meetings, star parties. and special events. Mr. Video also plans to include special segments on telescope use and astrophotography. Mr. Video is considering a quarterly presentation at general meetings.

ASTRONOMY AND TELESCOPE MAKING MAGAZINE SUBSCRIPTIONS

Jim Van Nuland tells me that our group subscription must be mailed on October 10, so time is short. If you are on the club subscription, please contact Jim immediately to renew or to drop. If you are subscribing on your own and your subscription expires during 1986, you may extend at the group rate to get in step. Jim will need the number from your mailing label. 1986 rates: $12 for ASTRONOMY and $7 for TELESCOPE MAKING or linear pro-rate for partial year.

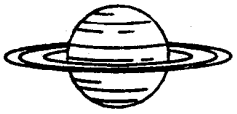
ASTRO ADS

FOR SALE: 6-inch Criterion RV-6 Dynascope reflector type telescope with electric drive and eight eyepieces. $200. Contact Rick Lucia at (408) 379-2181

STAR PARTY, HENRY COE PARK AUGUST 17

Jim Van Nuland reports: The several people who braved the threatened clouds were treated to a fine night at the August star party. The skies opened up shortly before sunset, and our first treat was the reappearance of Europa at the limb of Jupiter. The wind was problematic at first, but eventually calmed down. We enjoyed a number of bright meteors, possibly Persids, through the evening. I concentrated on globular clusters. Everybody's favorite was M92, the "other" globular in Hercules, Every bit as deserving as the somewhat overated M13. Overall, an excellent night. "If you stay away from the bad ones, you'll miss the good ones." Thanks, Jack.

THE CELESTIAL TOURIST SPEAKS
BY: JAY FREEMAN



I bought a Celestron 100 four-inch refractor at the Fremont Peak Observatory Association sale on August 10. My purchase was motivated as much by curiosity as anything else, though the instrument has several real virtues: It is car-portable with lots of room to spare, easy to move around even when all set up, and relatively unsusceptible to problems with dust, dew, thermal equilibrium and alignment. And the optics are very fine.

The high cost per unit aperture of small refractors tends to make them rather special-purpose instruments. The relatively long tubes required by systems rarely faster than f/9 or f/10, makes larger ones a bit clumsy, too. Yet at apertures below four or five inches, tube bulk is not likely to be a consideration, for tripod and mounting will likely be larger and heavier.

The C-100 is mounted as an altazimuth, with slow motions. The tripod is not as sturdy as I would like (few commercial units are), but the slow motion controls make it a lot more useable -- when you don't have to touch the telescope body to move it, the jiggles don't get started.

I eagerly set the little refractor up the evening after the sale. My first view was of Saturn -- always a beautiful sight -- and the crisp image and low-contrast disc features gave preliminary testimony to the high quality of the optics. One slow motion had a lot of play in it (since fixed), so I moved on to deep-sky objects rather than make tests at high magnification. Besides, the fog was in on the coastal plain below the Peak, and the night promised to be very dark.

The telescope shows great promise as a small deep-sky instrument. I went through about half the Messier objects that evening, with generally pleasing views. Four inches is at least twice as much aperture as required for a Messier survey, so I also looked at some more demanding things: NGC 6207, the galaxy half a degree northeast of M13, was easily seen and obviously elongated at 50X. Burnham's Celestial Handbook gives its magnitude and dimensions as 12.3 and 1 by 2 arc-minutes.

NGC 4565, our club's very own Padlock Galaxy, was magnificent at the same magnification -- with averted vision I could see not only the long, thin body and central bulge of this edge-on spiral, but also the dark lane and star-like nucleus. I have never made any particular effort to see how small an instrument would show these features, but my records list no previous observations of the obscuring lane and nucleus with anything smaller than an eight-inch. The very dark night and the excellent baffling possible in a refractor no doubt contributed to my success.

Continuing at 50X, Messier 31 in Andromeda revealed not one but two dark lanes, again a remarkable view for so small an instrument. I also looked for the Barnard dark nebulae mentioned by Walter Scott Huston the the August Sky and Telescope. The ones at the west end of M24 were easy and pretty, but I could not find B318 -- an almost linear east-west streak that passes just south of M11. I have seen this latter object with an eight-inch.

A few days later I tried the C-100 at higher magnifications, from my home in Palo Alto. Many urban sites in the Bay Area have frequent outstanding seeing: During the week of 11 August I had several evenings in which stellar diffration rings were always visible and mostly rock-steady.

Under these conditions it is fun to look at double stars. Everybody knows about Albireo, Mizar and epsilon Lyra, but many others are almost as spectacular and equally easy to find: Try zeta Aquarius -- the central star in the triangular "water jar" of that constellation, and gamma Delphinus -- the eastern point of the Dolphin's diamond-shaped body. The former has almost equally bright components spaced a little over 1.5 arc-seconds apart. It will be demanding in an unobstructed three-inch, easier if there is a large secondary obstruction (which narrows the Airy disc at the expense of brightening up the diffraction rings). Gamma Del has a separation of ten arc-seconds, and will be easy in almost any telescope.

There are several bright planetaries that survive city sky-glow pretty well. NGC 6543 in Draco and NGC 6826 in Cygnus are prime examples - both between magnitudes 8 and 9, both less than half an arc-minute across. The four-inch showed them well at 143X.

So what in conclusion? Is a four-inch refractor worth recommending? At a list price well over a thousand dollars, the answer is almost certainly a loud "NO". That kind of money will buy you a Coulter Dobson over four times the size! Even at an enormous bargan -- the FPOA was selling things at discounts of 60 to 70 percent -- the point is still arguable. My eight-inch f/5 Dobson could be duplicated for perhaps three hundred dollars: It blows the C-100 away in light grasp, and out-performs it notably on fine planetary detail. But for variety, for high-tech pack-rats, or for those of us who grew up bedazzled by the old Unitron catalogs, it's kind of fun. And maybe that's what counts.

I did not got to the "official" SJAA star party at Coe on the 17th of August, I went to Fremont Peak instead. Lots of our members were there -- somebody said something about Coe being closed due to fire hazard. I should say there were forty telescopes and twice as many people.

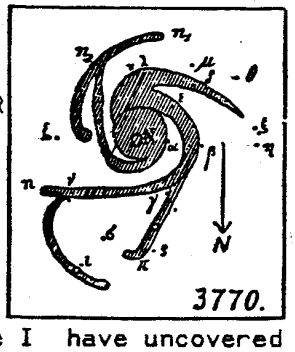
Frank Dibbell brought his Celestron 90mm fluorite refractor. Reactions included a lot of kidding about the "Teflon Tasco", mixed with oohs and ahs over the optics. Debbie Moore had her 10-inch f/5 Newtonian. Bob Schalck and Doug Berger were observing with the latter's 16-inch Dobson, Tom Ahl had a 13.1-inch Coulter, Bob Fingerhut was set for deep-sky photography with his 16-inch, Melanie Barham was trying planetary photos with her C-8, and the local raccoons were out in force. I had brought my 8-inch f/5, but used it little: I spent most of my time mooching views though other telescopes -- not hard to do when you know where to find things and have a pocket full of eyepieces!

It was not as good a night as on the 10th -- there was no low fog to turn off the city lights. There had been a trace of rain earlier in the day, but the night was dry and only a little cool, and the seeing was reasonable.

I spent a while chasing down an elusive group of galaxies in Hercules, that Walter Scott Huston had mentioned several years ago. The NGC catalog lists three closely-spaced galaxies on the far side of M13 from NGC 6207 -- about one and a half times as far away, almost diametrically opposite to the latter. The three are numbers 6196, 6197, and 6199. The brightest is 6196, at a cataloged magnitude of 14. Identification is complicated by the presence of at least one more galaxy nearby, which is not in the NGC. My eight-inch showed 6196 at 51X, a C8 at 100X showed one additional galaxy,and Doug's 16-inch showed four in all at 90X and at 150X.

It is interesting to set a telescope first on the bright, familiar M13; then on the less well-known NGC 6207; then finally on this group of faint fuzzies.

DEEP SKY NOTES - OCTOBER
BY: STEVE GOTTLIEB



The following is a list of errors and misidentifications in the Revised New General Catalogue (RNGC) which either have been gleaned from other articles or those I have uncovered from my own investigation.

Some errors have occured due to faulty or imprecise coordinates in the original NGC by J.L.E. Dreyer. In other cases the NGC object was a duplicate or erroneous entry. Yet the RNGC has designated a nearly anonymous object even when the position and description did not match. If you have additional comments on this list or know of other errors in the RNGC that you are aware of, I would like to hear from you! Perhaps a definitive NGC will one day be published.

RNGC CORRECTIONS

NGC 3745, 3746, 3748, 3750, 3751, 3753, 3754 (Copeland's Septet). Listed as non-existent in the RNGC due to incorrect coordinates in the original NGC. The positions were corrected by Dreyer himself in the IC 1 notes. Lord Rosse discovered this group. Corrected coordinates: (1975) N3745 11h 36.4' +22°10, N3746 11h 36.4' 22°09, N3748 11h36.5' 22°10, N3750 11h 36.5' 22°07, N3751 11h 36.6' 22°05, N3753 11h36.6' 22°08, N3754 11h 36.6 22°08.

NGC 6197, 6199 (Hercules). NGC 6199, discovered by Marth, is non-existent and should be given a "7" designation in the RNGC. In an attempt to account for N6199 the RNGC gave it the coordinates of object N6197 and then reassigned N6197 to a very faint galaxy 1.3' SW of N6196. So change the 1975 RNGC coordinates for N6197 to 16h37.1 +36°02' and delete N6199.

NGC 545,547,547A. The NGC lists the double galaxies and N545 and N547 but the RNGC mistakenly lists this pair as N547 and N547A and reassigns N545 to a mag 15 galaxy west of this pair. Change RNGC 545 to 1h24.7' -01°28' and new description E,R,BM CONT W/547. Change RNGC 547 to 1h24.8' -01°29' and new description E,R,BM,CONT W/545. (the orientation of the 2 bright galaxies is SW - NE). Delete the entry for N547A.

NGC 4347/4342. The NGC gives N4341, N4342, N4343 as William Herschel's III94,III95, and III96, but his later observation and John Herschel's observations just showed N4343. The galaxies RNGC 4341 and RNGC 4342 are equal to IC 3260 and IC 3256 respectively and the CGCG recommends deleting N4341 and N4342 and using the IC designations instead. Many sources have disagreed on the identifications of N4343,4342, and 4343.

NGC 4565A (Coma Berinices). While the latter designations found in the RNGC are generally anonymous galaxies near brighter galaxies and catlogued in the CGCG and/or the MCG, this entry is just a duplicate of N4562 (identical coordinates). Hence delete RNGC 4565A.

NGC 6056 (Hercules Galaxy Cluster) The RNGC lists RNGC 6056 as the north following of 2 small galaxies SW of N056. This ID is improbable as both objects are much fainter than N6056. Hence the position given for RNGC 6056 is 2.2' SW of the correct galaxy.

NGC 2288,2289,2290 (Gemini). Dreyer confused the identifications of this group of 5 galaxies (N2288,89,90,91,94) from Lord Rosse's sketch which revealed 3 new "novae". N2289 and N2290 were previously discovered by W. Herschel. Now the RNGC has confused N2288 and N2289 and reversed the coordinates and the descriptions.

NGC 7173,7174,7176, (Pisces Austrinus). These three are part of a quadruple group including NGC 7172. The RNGC confused N7173 and N7174, reversing the coordinates and the new descriptions. N7174 forms a close pair with N7176 as stated in the NGC ("p of D neb") which gives correct coordinates. Coordinates of N7176 should be 22h00.8' -32°09', and coordinates of N7173 are 22h00.6' -32°08'.

NGC 6053 (Hercules Galaxy cluster). According to Corwin, N6053 = IC 1180 + a star. The RNGC identifies N6053 with a small galaxy 6' S of N6057. This is improbable as the NGC position is over 6' NW the RNGC object. Delete N6053.

NGC 5580 (Bootes). The orignial NGC coordinates for this object are 2.5' ENE of N5579. No galaxy exists in this position. The RNGC gives a faint galaxy south of N5579 (though it lists identical coordinates for N5579 and N5580), a very unlikely choice. There is a knotty structure in the spiral arm NE of the nucleus of N5579. If J. Herschel saw this knot, then N5580 is a part of N5579, but more likely this number should be deleted from the RNGC.

NGC 6959, 6965 (Aquarius). NGC 6965 is a duplicate entry for NGC 6963 due to incorrect coordinates derived from Load Rosse's sketch of N6965. The correct coordinates were later given for this galaxy by Bigourdan as N6963. So delete N6965 from the RNGC. The RNGC gives the coordinates of N6959 to N6965 So change the 1975 RNGC coordinates for N6969 to 20h45.8 +00°21'.

NGC 2830,2831,2832 (Lynx). Lord Rosse's discovery of N2831 and N2832 led to incorrect descriptions in the NGC (due to Dreyer's confusion about Rosse's sketch of the field) and N2830 is listed as 3rd of 3 instead of 1st of 3. Similarly N2832 is listed as 1st of 3 instead of 3rd of 3. Change the old and new RNGC descriptions to: 2830 F,S,LE,BM AND EON,BM. 2831 F,VS,R, AND E,R,BM,ALMSTEL. 2832 CB,CL,E AND E,R,BM,

NGC 1627, 1628 (Eridanus). The new descriptions in the RNGC are reversed for these 2 galaxies. The edge-on system to the N at 4h36.3' -4°45' is N1628.

NGC 3191, 3192 (Ursa Major). Dreyer lists N3191 from J. Herschel but this is a duplicate entry for W. Herschel's N3192 as both saw the same object. So reassign RNGC 3192 to Class"7" (non-existent object). In an attempt to identify a galaxy for N3192, Dreyer picked a galaxy south-west of N3191 with a photographic magnitude of 15.6. Designating N3192 as N3192B would also be undesirable.

NGC 512 (Andromeda). The new description in the RNGC "R,SLDIF,BM,B EL COM 2' N" refers to an anonymous companion 2' south of N512 and the bright, elongated system is actually N512.

NGC 408 (Pisces). The old description in the RNGC was copied incorrectly from the NGC. Change the old description to VF, VS, 410F8S, (not 406)

NGC 3850, 3889 (Ursa Major). NGC 3889 was discovered by Rosse in 1852 5' NE of N3888. This would place it in the position of MCG 9-19-191. A later observation in 1878 placed it SE where it entered the NGC incorrectly. In an attempt to identify N3889 the RNGC assigns it the same coordinates and new description as N3850! So either delete N3889 or change its position and description to MCG 9-19-191.

GIACOBINID METEOR SHOWER PREDICTIONS "UP IN THE AIR"
BY: DON MACHHOLZ

A meteor shower, connected with Periodic Comet Giacobini-Zinner (1984e), is expected to take place October 8. Predicting the shower activity is a complicated task.

The October Draconids, also knows as the Giacobinids, occur because the earth passes through a swarm of meteoroids associated with the comet. The comet, Giacobini-Zinner, appears to travel with a swarm of material on its 6.5 year orbit, a path that takes it from the earth's orbit to slightly beyond Jupiter. The comet crosses the earth's orbit at the place in which the earth finds itself on Oct. 9.

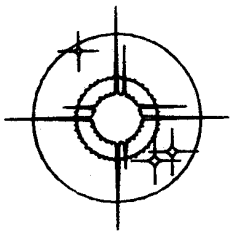
The comet was discovered in 1900, but it wasn't until 1926 that the meteor shower was observed. Up to 17 meteors/hour were seen. The comet had crossed the earth's orbit 70 days after the earth was at that point. In 1933, the comet crossed the earth's path 80 days before the earth and 300-6000 meteors/hour were seen. In 1939 the comet lagged 136 days behind the earth and no shower was observed. The greatest shower, however, was in 1946, when 10,000 meteors/hour were observed. That year the comet had passed the earth's orbit 18 days before the earth. This year the comet crossed the earth's plane on Sept. 11, 27 days before the earth's arrival. This would imply a very strong shower.

On the other hand, the planet Jupiter has been changing the orbit of both the comet and the meteor swarm. Its orbital period has meandered between 6.41 and 6.60 years since 1900, and, more importantly, its perihelion distance-its closest approach to the sun-has varied between 0.93 and 1.03 AU. This time it's at 1.028 AU while the earth will be at 0.999 AU - a difference of roughly three million miles at closest approach. Until the shower was first seen in 1926, the comet perihelion distance was increasing from 0.93 AU to 0.99 AU. It remained at 0.99 AU (and the showers were strong) until the 1950's, when it came in at 0.93 AU again. By 1972 it was back to 0.99 AU, but no showers were observed, probably because the comet did not cross the earth's orbit near Oct 9.

This year the earth will be closest the comet's path on Oct 8, 1312 UT. This is 0612 (AM) PDT on Tuesday, Oct.8, and during daylight hours further east. The swarm is believed to be narrow, lasting only a few hours of "earth-travel", but you may wish to observe during Oct. 7-10, because Jupiter may have scattered the swarm. The meteors radiant is at 17h 28m, +54°; this is high in the sky at evening, very low in the morning. The meteors are of fragile material, they are faint, slow and have generally short trails, under ideal conditions a glow from the meteorid dust may be visible extending westward from RA 18h 38m, +9°, and eastward from 06h 38m, -9°. Look for this, however, a 40%-lit moon rising shortly after midnight will interfere.

Regardless of what the meteor shower does, the "parent" comet will be at 07h 05m, -9°, shining at magnitude 9. It has performed better than expected. Perhaps its "children" will too.

COMET COMMENTS
BY: DON MACHHOLZ



One faint comet has been recovered. Comet Giacobini-Zinner is moving south and dimming in the morning sky. Also in the morning sky, but soon to enter the evening sky, Comet Halley brightens as it moves towards both the earth and the sun.

Periodic comet Daniel (1985j): This comet was recovered by J. Gibson of Palomar on July 27. At that time it was eight degrees from Halley's Comet and magnitude 20. It was closest the sun in early August, it will not get much brighter. It's orbital period is 7.1 years.

PERIODIC COMET GIACOBINI-ZINNER

This comet is slowly pulling away from both the earth and the sun. It remains in the morning sky as it moves rapidly southward. During this month it dims by 1.6 magnitudes. The comet passes over the open cluster M50 on Oct. 7. On Oct. 8 we may see parts of this comet in the Giacobinid meteor shower.

WHAT GOES AROUND COMES AROUND - HALLEY'S

Halley's Comet continues to brighten in the morning sky. Although in mid-September it was running about 0.5 magnitude fainter than predicted, I will continue to hold to former predictions as the coma continues to develop.

The comet's distance from the sun will decrease from 219 to 179 million miles during October. The comet-earth distance will decrease from 189 to 100 million miles this month.

Halley's Comet appears to move 10 degrees in October, increasing in speed each day. On October 8 it passes a short distance south of the diffuse nebula 2174-5. This nebula is visible under dark-sky conditions, however, the last-quarter moon will be in the sky at that time. On Oct. 29 the comet will pass 0.5° south of M1, once again the moon, then full, will interfere. This is unfortunate, as Halley's Comet has passed near M1 on most of its previous returns. This time it's difficult to observe.

DATE	R.A. (1950)	DEC	ELONG	MAG.
09-27	06h 39.8m	+02° 49'	83°	8.6
10-02	06h 50.7m	-02° 49'	85°	8.8
10-07	07h 00.0m	-07° 54'	87°	9.0
10-12	07h 07.7m	-12° 28'	88°	9.2
10-17	07h 14.0m	-16° 34'	90°	9.5
10-22	07h 18.8m	-20° 15'	92°	9.7
10-27	07h 22.3m	-23° 31'	94°	10.0
11-01	07h 24.3m	-26° 26'	96°	10.3
11-06	07h 24.9m	-29° 01'	99°	10.5

The table gives positions for Halley's Comet of October. I'm again including elongations (angular distance between the comet and the sun as seen from earth) and magnitude predictions. I've added the rising time for the comet as seen from standard meridians at 40° and 30° latitudes. Some are given in Daylight times; those marked by an * are in Standard Time. First determine the rising time for your latitude by interpolating between 30 and 40 degrees latitude. Secondly, calculate for longitude: add four minutes for each degree you are west of the standard longitude (75°, 90°, 105°, 120°) or subtract four minutes for each degree east. Finally, realize that although the comet will be rising at that time, it will not be easily visible for at least an hour.

This month the moon will not interfere between Oct. 10 and Oct. 25, giving two full weeks of dark-sky observations. I have found the finder maps in Sky and Telescope to be very Helpful in locating the comet. SJAA's own Rich Page, using such a chart, located the comet in his 14" reflector from Loma Preita on both Aug. 25 and 27, perhaps our first club member to see the comet.

Date	RA (1950)	Dec	El.	Mag.
09-27	06h 12.5m	+19°53.3'	90°	11.4
10-02	06h 11.1m	+20°02.9'	96°	11.1
10-07	06h 08.5m	+20°14.4'	101°	10.7
10-12	06h 04.5m	+20°28.2'	107°	10.4
10-17	05h 58.6m	+20°44.7'	113°	10.0
10-22	05h 50.2m	+21°04.0'	120°*	9.6
10-27	05h 38.5m	+21°25.8'	128°	9.2
11-01	05h 22.2m	+21°48.6'	137°	8.8
11-06	04h 59.8m	+22°08.0'	147°	8.3

Date	RA (2000)	Dec	Rise: 40° lat	30°
09-27	06h 15.5m	+19°52.4'	2341	0003
10-02	06h 14.1m	+20°02.1'	2319	2343
10-07	06h 11.5m	+20°13.8'	2256	2319
10-12	06h 07.5m	+20°27.9'	2232	2255
10-17	06h 01.6m	+20°44.8'	2203	2227
10-22	05h 53.2m	+21°04.7'	2134	2158
10-27	05h 41.5m	+21°27.3'	2002*	2026*
11-01	05h 25.2m	+21°51.3'	1923*	1947*
11-06	05h 02.8m	+22°12.3'	1839*	1904*

MORE FROM THE CELESTIAL TOURIST
BY: JAY REYNOLDS FREEMAN

Modern technology provides fair-sized high-quality telescopes at low prices, but as sold, many such instruments are incomplete: They have too few eyepieces and perhaps no finder. Optical accessories are extremely expensive -- one can pay several hundred dollars for a long focal-length wide-field eyepiece -- and many of us have limited budgets, so it is useful to think hard about the distinction between the necessary, the desirable and the merely frivolous.

The two most common goals of visual observing are to see faint, extended objects and to see fine detail. Eyepieces should be selected with these purposes in mind.

Faint fuzzies are usually best seen when their light is concentrated onto a small an area of the observer's retina; that is, at low magnification. At too low a power, the beam of light from the eyepiece is too wide for the pupil of the eye, and light will be waisted. The diameter of the dark-adapted pupil varies from person to person, but certainly almost no one will want a magnification lower than three and a half time the diameter of the telescope objective in inches (ie., 28X for an eight-inch, because 3.5 X 8 = 28).

Reasonable contrast also helps in observing faint things, and unless the sky is exceptionally dark, powers as low as 3.5 per inch will show the background skyglow too brightly. For this reason, I find slightly higher magnifications -- perhaps 4.5 to 6 per inch -- generally satisfactory as "low" power. That would be 36 to 48 power on an eight-inch. Many extended objects will yield pleasing views at still higher power, but nevertheless I would consider 4.5 to 6 per inch more basic for these observations. If I could own just one eyepiece, that would be it.

The low-power eyepiece should have a wide field of view, both because many popular extended objects are pretty large, and because a wide field will aid in finding things when the telescope isn't pointed correctly. Field of view will be limited either by the eyepiece design itself or by the diameter of the eyepiece holder.

Wide-field eyepieces require complicated, expensive designs to function well, particularly with "fast" telescopes (f numbers like four or five). It is a catch-22 of amateur astronomy that inexpensive telescopes, like f/4.5 Dobsons, require very expensive eyepieces; and that slower telescopes, like f/10 Schmidt-Cassegranians, which do not need costly eyepieces, are already budget-blowing in their own right.

The upper limit to useful magnification is set by three things: The smoothness and ease with which the telescope can be made to follow an object at high power, the stability of the atmosphere, and the size of the diffration disc produced by the telescope itself.

Smoothness of tracking will be a problem with poorly-made mountings. If the telescope jiggles too much, or if the combination of bearings and slow motions forbids smooth tracking, forget it! But one does not necessarily require fancy apparatus: Well-executed Dobson mountings are excellent -- the butter-smoothness of Teflon bearings is such a joy. I have used 500X quite happily on the Club's 12.5-inch Dobson, with no more slow-motion controls than a finger on the side of the tube.

The SJAA's observing sites in the California coastal ranges have some of the best astronomical seeing on the planet Earth. Our largest telescopes commonly run diffraction-limited continuously. A person who does lots of high-power work might want several different magnifications, to allow for seeing variations' but I would recommend that a more casual observer, interested in fine detail, obtain only one high-power eyepiece, selected to take advantage of the best conditions.

So if your telescope mounting is up to it, I suggest a high-power eyepiece that provides approximately 30 power per inch of aperture -- that would be 240X on an eight-inch. This magnification will easily show the diffraction disc and rings of a star, and should let you see all the image detail you objective provides.

A device called a Barlow lens or a telextender can be used to double or tripple the magnification of a low-power eyepiece, but good ones are scarace and expensive. I would rather have plain eyepieces.

High-power work rarely requires a wide field of view, though one may help in locating and tracking.

I find deep-sky objects that way I might use a map to find buried treasure: "Two-thirds of the way from the boulder to the big tree -- X marks the spot." Dig here. Similarly: "Two-thirds of the way from gamma to beta Lyra -- X marks the spot." Set the crosshairs here and the Ring Nebula will be in the field of the main telescope, whether I can see it in the finder or not.

To use this technique, my finder must be large enough to show the faintest stars on my charts. It shouldn't be any bigger, because additional, uncharted stars would be confusing. It must have a field of view wide enough so that several stars are visible even in the emptiest parts of the sky.

I commonly use the AAVSO VARIABLE STAR ATLAS, whose chart limit is magnitude 9.5. The 10 power, 40mm-aperture finder that came with my Celestron 14 has almost exactly this limiting magnitude when used in dark skys. My eight-inch Dobson has a 5 power, 24mm finder, whose dark-sky limiting magnitude is about 8.5. It is thereby a pretty good match for the Tirion atlas or the old Skalnate Pleso atlas.

When the sky is brighter, things change. From the suburbs on the San Francisco peninsula, the 5x24 will barely reach to magnitude 6.5, which makes it reasonable to use with NORTAN'S STAR ATLAS or any other that shows only naked-eye stars.

I find these finders perfectly satisfactory and would not recommend larger ones.

Let's try some specific cases. Suppose we have a new Coulter Odyssey 10, a 10-inch f/4.5 Newtonian mounted as a Dobson. It comes with a 27mm Kellner eyepiece and no finder. How shall we equip it?

Try the Kellner. If its images satisfy you, keep it as your low-power eyepiece. If not, save your pennies and get an Erfle or comparable wide-field eyepiece with a focal length in the range 20 to 28 mm. I am very fond of 20mm Erfles with such telescopes. Mine was from Meade, but similar ones are available from other vendors. The Edmund 28mm RKE eyepieces might also be satisfactory, but try one out first. The Teleview Naglers give magnificent views, but are very expensive; and their apparent field of view is almost too wide. I would not recommend one for an astronomer on a budget.

But by all means bring the telescope to star parties, and ask others to try their eyepieces on it. Pay attention to image quality at the edge of the field, and look for "ghost" reflections near bright objects.

For high power, borrow a 4mm Orthoscopic and see if you can track satisfactorily with it. If so, save money and buy one. If not, try 6 or 7mm. (and if you are not interested in high-power work, skip it.)

These two eyepieces might be all you require. If I had to recommend a third, it would probably be another wide-field one, with a magnification 60 to 80 percent greater than your low-power eyepiece. You might end up with 27, 16, and 4mm eyepieces. Or 20, 12,6.

There is no need to use two-inch diameter eyepieces on instruments this fast -- eyepieces with lenses that large will give magnifications too low to be useful.

Don't feel obliged to get a big finder. A 5X24 or 6X30 should be adequate. You can probably get one second-hand from someone who has been seduced by the ads and bought a bigger one.

Alternatively, suppose you have a new f/10 Schmidt-Cassegrain -- a Celestron 8 or 11, or perhaps a Meade 2080 or 2120. (Much the same advice would apply for a refractor near f/10.) The stock finder will be adequate, and whatever eyepieces came with it are probably useable.

The big problem will be lack of a low power: the right focal length for this eyepiece is 40 to 55 mm, and it would be desirable to have the wide field of view that a two-inch barrel allows. Unfortunately, the interior baffles on the 8-inch units greately restrict the field of view, so it might not be worth buying the two-inch adaptor for these telescopes. But I still recommend a long-focal length eyepiece. a 40mm Kellner or Symmetrical in a 1.25-inch barrel is relatively cheap. There is no need to pay for Erfles and such unless you can use the wide field the design provides.

I suspect the C-11 and Meade 2120 could reasonably use the two-inch diameter eyepieces. I know the C-14 can: My favorite eyepiece with this instrument is a 55mm Plossl in a two-inch mount, yielding 71X. and if you plan on someday buying a telescope that can use two-inch eyepieces, there might be some sense to getting one now.

I would recommend a 7 or 8mm eyepiece for high-power viewing with these instruments. It need not be a fancy variety.

ASTEROIDAL AND COMETARY OCCULATIONS
BY: JIM VAN NULAND

On the usual short notice, a number of greater bay-area observers attempted an occultation by (230) Athamantis on August 31. a rather large effort was launched because last-minute astrometry (the only kind) had showed that San Jose was in the middle of the path. Several observers watched the asteroid merge with the star for several minutes, but no occultation was observed. As of September 8, we don't know where the shadow passed.

An occultation of another sort was attempted on Sept 2 -- passage of P/Giacobini-Zinner across a 6th-magnitude star. The prediction was complicated by the non-gravatational motion of G-Z, which was both irregular of a greater amplitude than the accuracy needed to direct the portable photoelectric observers. The nucleus of a comet is very tiny, so a direct occultation was not expected; instead, we hoped to measure the dimming of the star, to obtain an estimate of the density of the dust near the comet.

The elevation at mid-time was only 9° on the west coast, so predictably all efforts were clouded out. So also was much of the rest of the country. so far no reports of successful observation (with or without dimming).

PLANETARY NEBULAE IN EAST CYGNUS
BY:JACK MARLING AND STEVE GOTTLIEB

Last month we discussed planetary nebulae in west Cygnus, and this month we will add 15 more planetary nebulae in east Cygnus.
On August 25, I looked very carefully for Weinberger 1-10 discussed last month and can state that it is fainter than about 16th magnitude, as it was not visible in a 17½" telescope at 80x with an O-III filter, nor at 220x with a UHC filter. I looked at the exact spot using a Palomar Sky Survey (POSS) print. This month we examine both bright and faint Planetaries ranging from 8th magnitude NGC 7027 to 16th magnitude Minkowski 1-78, so there will be a challenge and something new to see for every observer. Some have not yet been seen visually, so you could be among the first people in the world to see them.

DESCRIPTION OF INDIVIDUAL PLANETARIES

NGC 7008 This showpiece 10th magnitude planetary has a large size, good brightness, and a visible 13th magnitude central star. Observing with a 13" telescope at 166x from Digger Pines, Steve Gottlieb noted, "Annular, central star visible, 2nd star embedded at eastern edge of ring, slightly elongated, brighter knot on the northeast edge".

CRL 2688 Also called the "Egg Nebula", this is a compact, bipolar protoplanetary nebula. At Digger Pines on August 20, 1985, using a 13" Odyssey I at 166x Steve observed, "Faint double (mag. 12 and 14) oriented SSW-NNE separated by 10". At 220x the brighter component is slightly nebulous.

NGC 7026 this bright 10.9 magnitude planetary has a pretty high surface brightness. Observing from my backyard in Livermore using a 14¼" telescope at 280x I noted "Pretty small planetary with 2 lobes, bright star nearby".

NGC 7027 At magnitude 8.5, NGC 7027 is the brightest planetary in cygnus, and should show color due to its 5th magnitude surface brightness. At 280x from by backyard (14¼" scope) I noted "Very bright small planetary, elongated". In his 13" from Digger Pines Steve observed, "At high power (330x), elongated, 2 condensations or nuclei possibly detached".

SHARPLESS 1089 This nebula was discovered photographically by Sharpless in 1959. There is no published data other than a photographic (blue) surface brightness of 15.1 corresponding to a calculated 16.0 photographic magnitude. Steve and I did not know what to expect but we looked for it anyway. We made what is certainly the first ever visual sighting August 11-12, 1985, from Digger Pines. Using a 13" Odyssey I at 79x and an Oxygen-III filter Steve noted, "Small, extremely faint (estimate mag. 15.0), requires averted vision". On a 17½" telescope at 80x using an O-III filter I noted "Pretty faint nebula almost needs averted vision, looks round and uniform". to find Sh 1-89 go 1½° due north from NGC 7048, described below.

NGC 7048 This 12th magnitude planetary was discovered by Curtis in 1919. using a 14¼" telescope from Livermore at 280x with a UHC filter, I observed "large faint nebula, elongated, averted vision, 3 nearby stars, no central star visible".

MINKOWSKI 1-78 discovered photographically by Minkowski in 1946, little is knows other than a 12.2 red surface brightness measured by Kohoutek in 1964. Kohoutek stated that the blue photographic surface brightness was greater than 16.5 which does not bode well for observations. Fortunately Kaler measured the H-beta flux in 1983; if I assume that the oxygen lines are 10 times stronger than H-beta, quite usual for planetaries, then M 1-78 should have a visual magnitude of 16.1 with a range of uncertainty of 14.8-19.3. A sighting (or lack of one) is needed. Look for M 1-78 26 arc-minutes south and 12½ arc-minutes east of mag. 7.3 star plotted on the Tirion Sky Atlas 2000.0. If you are wondering if the professional astronomer jim Kaler saw M 1-78 when he measured the H-beta line flux, the answer is probably not. Kaler stated in his papers "Most of the fainter nebulae could not be seen at the (40") telescope and had to be located by blind off see from a nearby SAO star". Kaler did not use filters for viewing.

KOHOUTEK 3-81 This compact nebula was found by Kohoutek in 1972 using a 32" f/3 Schmidt camera and 4° objective prism with 103a-e film and red filter. Stars show up as lines and emission objects as discs or as a "bump" on the continuum of the star. On August 24-25, 1985, I made a first visual sighting of K 3-81 at digger Pines. From a 5.8 magnitude star plotted on the Tirion Atlas I went 7 arc-minutes south and 34 arc-minutes east to find K 3-81. using the 17½" telescope at 280x with a UHC filter I noted "very small round nebula, requires averted vision, about mag. 15½; a central star or interior star seen without filter.

HUMASON 1-2 This magnitude 12 planetary was discovered by Humason in 1921. From El Cerrito with a C-8, Steve noted back in 1981, "At 100x, mag. 12 "star" but the planetary presents a non-stellar disc at 200x". Using the 17½" telescope at Digger Pines Observatory at 280x with a UHC filter I noted "Bright 12 mag. nebula, elongated 2:1 NE/SW (about 6x12"). The professional literature only gives Humason's original size of 5 arc-seconds, which is clearly incorrect. you can find Hu 1-2 just 12 arc-minutes north and 7.6 arc-minutes west of a 7.6 magnitude star plotted on the Tirion Atlas.

KOHOUTEK 3-82 This was found along with K 3-81 by Kohoutek in 1972. It is a little faint ring about 20 arc-seconds in diameter that is easily located exactly 20 arc-minutes due west preceeding a 5.8 magnitude star. Kohoutek gave it a 14.0 photographic surface brightness corresponding to a 16.5 photographic magnitude. Thus I was delighted that its true visual magnitude was 1½ magnitudes brighter when I made a first ever visual sighting of it on August 15, 1985, at Digger Pines. Using a 17½" telescope at 220x with an Oxygen-III filter I noted "Pretty easy to see, round, uniform, visible with UHC but better with OIII, just visible without any filter. Located at the end of a chain of 5 stars.

KOHOUTEK 3-62 Found by Kohoutek in 1964, this little stellar planetary had no data. using a photographic finderchart on August 25, 1985, I barely found a 15-16 magnitude stellar object, using a 17½" scope, 280x and UHC filter, and noted "Extremely faint stellar planetary, not really visible without filter".

IC 5117 This stellar planetary was found by Fleming in 1905, and is easy to see at magnitude 11½. Steve saw it from El Cerrito using his 13" Odyssey I and noted, "Easily visible mag. 11.5-12.0 "star" without any filter. Forms a close double with a brighter mag. 10 star just east. With OIII filter, IC 5117 is a magnitude brighter than this star!" You can locate IC 5117 22 arc-minutes east and 17 arc-minutes south of mag. 6.8 star plotted on the Tirion Atlas. using a UHC filter at 280x I noted that IC 5117 was slightly brighter than the close companion star to the NE. Thus stars are dimmed about 2½-3 magnitudes with an OIII filter, and about 1½-2 magnitudes with a UHC filter. This explains the dramatic effect in "blinking" stellar planetaries with these filters.

ABELL 78 discovered by Abell in 1955, this faint nebula is centered between two bright 7 and 8 magnitude stars. The 7.2 magnitude star located 6 arc-minutes north and 5 arc-minutes west of A 78 is plotted on the Tirion Atlas. Steve observed A 78 August 11, 1985, from digger Pines using an OIII at 78x with his Odyssey I and noted, "Very faint, definitely seen with averted vision, moderately large and rounded." I saw A 78 on June 22, 1985, using a 24" at 180x from Mauna Kea. Using a UHC filter I observed, "Very faint nebula around a faint (13.3 mag. central) star.

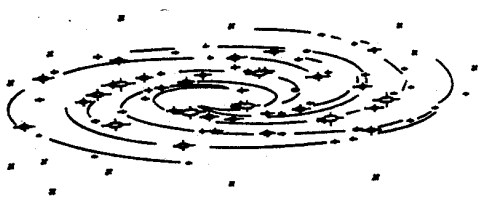
MINKOWSKI 1-79 Discovered by Minkowski in 1946, this is pretty bright for an "obscure" planetary nebula. you can easily find this 13th magnitude nebula just 1° NE from M-39. I observed it Nov. 22, 1984, from Mauna Kea with a 24" telescope at 280x and UHC filter as a fairly bright, elongated planetary, no central star visible. Using a 13" at 214x Steve noted, "Bright enough to be visible unfiltered with direct vision, roundish, faint stars off west end and on east edge".

KOHOUTEK 3-84 Discovered photographically by Kohoutek in 1972, this compact planetary has not yet been observed visually and a sighting is needed to pin down its visual magnitude, which should be in the range of 14½-16½. Look for K 3-84 15 arc-minutes north and 34 arc-minutes west of a mag. 6.2 star plotted on the Tirion Atlas.

MINKOWSKI 2-50 This magnitude 14.7 compact planetary was discovered photographically by Minkowski in 1947, and was probably seen by Tim Barker in the early 1970's when he made photo-electric flux measurements on it (which I used to compute the visual magnitude). M 2-50 has not yet been seen by amateurs: look for it 10.6 arc-minutes north and 22½ arc-minutes west of a mag. 7.8 star plotted on the Tirion Atlas.

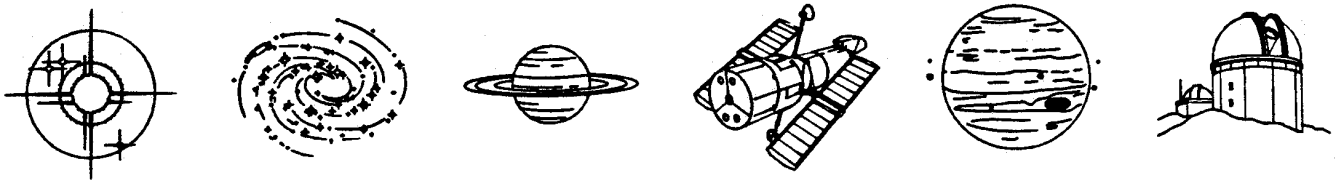
Besides being both fun and challenging, observing planetaries can contribute to increased knowledge of these objects. In this eastern portion of Cygnus, Steve Gottlieb and I observed six planetary nebulae, probably for the first time ever by any human. These observations helped pin down the true visual magnitude, and in the case of Hu 1-2, provided a more accurate size. Please contact Steve at 415-524-4678, or me at 415-443-7579 with any observations of these you make, especially the fainter objects.

NGC 7008 PHOTO BY JACK MARLING, 24" F/9, 50 MIN. FROM MAUNA KEA, B&W PRINT FROM FUJICHROME 400 NEGATIVE.



The table below gives the planetary's name and 2000.0 epoch coordinates, as well as the size in arc-seconds, true visual magnitude, visual surface brightness, and V (yellow) magnitude of the central star.

Name	2000.0Coordinates R.Ascen. Dec.	Size arc-sec.	Visual Magnitude	Bright-ness	Nucleus
NGC 7008	21h 00.6,+54°33	98x75	10.7	11.5	13.2
CRL 2688	21h 02.3,+36°42	16"	13.5		12.25
NGC 7026	21h 06.3,+47°51	29x13"	10.9	8.4	14.5
NGC 7027	21h 07.0,+42°14	18x11"	8.5	5.3	15
Sh 1-89	21h 14.0,+47°45	44x29"	14.8±.5	13.9	19.1
NGC 7048	21h 14.3,+46°18	62x60"	12.1	12.0	18.3
M 1-78	21h 20.8,+51°54	6"	15-19	11.6	?
K 3-81	21h 22.3,+38°07	11"	15.5±.5	11.3	?
K 3-82	21h 30.9,+50°00	19" ring	14.9±.5	12.4	19.5
K 3-62	21h 31.9,+52°34	3"	15.6±.5	5.8	?
IC 5117	21h 32.5,+44°36	2"	11.5	3.7	16.7
Hu 1-2	21h 33.2,+39°38	5"	12.0	6.6	15.1
Abell 78	21h 35.5,+31°42	113x88"	13.4±.5	14.5	13.3
M 1-79	21h 37.0,+48°56	39x27"	13.2	11.8	14.4
K 3-84	21h 38.8,+46°01	10x8"	15.5±1	11.4	?
M 2-50	21h 57.7,+51°42	5x3"	14.7	8.7	?



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