



San Francisco Amateur Astronomers

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

President:	Irving Hochman	641-0770
Vice President:	Bob Levenson	468-3592
Secretary/Treasurer:	Chelle Beard	878-4965
AANC Representative:	Nancy Cox	826-2217
Bulletin Editor:	Jim Shields	585-4088
Public Relations:	Douglas Wolfe	386-1876

BULLETIN FOR AUGUST 1989

Date: WEDNESDAY, AUGUST 16
Time: 8:00 P.M.
Place: J.D. Randall Museum
Event: LUNAR ECLIPSE

Come join us to observe a total eclipse of the Moon during our regularly-scheduled monthly meeting time! In our time zone the Moon rises during totality. The challenge will lie in spotting the faint brown disk low in the southeastern sky as twilight deepens. The last half of the very long eclipse - lasting 1 hour 36 minutes - should however occur in plain view.

SATURN OCCULTS 28 SAGITTARII: THE VIEW FROM FIDDLETOWN

JOEL W. GOODMAN

A landmark event in astronomy took place on the night of July 2-3. Saturn and its ring system occulted a modest star of magnitude 5.4 in Sagittarius. Thus was 28 Sagittarii rescued from obscurity and elevated to everlasting fame in the archives of astronomy. The unusual nature of the event can be appreciated by realizing that 28 Sagittarii is the brightest star to be occulted by Saturn since records have been kept, as well as for the foreseeable future (at least 200 years hence), marking it an extremely rare and exciting opportunity to observe density variations in Saturn's rings, because the star brightens and dims as it passes behind the rings. Obviously, the ease of observing a star behind the rings is directly proportional to its brightness. I observed Saturn occult an 8.2 magnitude star in 1962 through the 36-inch refractor at Lick Observatory. The star remained visible through most of its passage behind ring A (the outer ring), its apparent brightness changing perceptibly as a function of ring density. Then it brightened spectacularly as it entered Cassini's Division, which separates the two principal rings of the planet, before disappearing behind the denser ring B. 28 Sagittarii, almost 3 magnitudes brighter than the star occulted in 1962, could be expected to put on a show that would be spectacular in even small amateur telescopes. With that in mind, Irv Hochman and I headed toward Fiddletown on July 2, telescopes in hand, under cloudless skies.

(Continued on page 11)

THE SIDEWALK ASTRONOMERS' VIEW - by Carl Trost

Saturn occulted 28 Sag on the night of July 2-3. Thanks to Douglas Wolfe for organizing a star party in front of the Cala Foods market on Geary Street, to Al Paris who brought his new Meade Cassegrain and to Jeff Cobb, who stayed to the end with his 10" Coulter.

The last part of the occultation was the best. The atmosphere had improved appreciably by 1:26 am when the star emerged from behind Saturn, to the extent that the star could be seen passing behind the rings. In addition to interested passersby, we attracted a small but extremely enthusiastic following who thought it was one of the beautiful sights they'd ever seen but who probably never remembered a thing the next day.

The Saturn Occultation from Fiddletown by Steve Gottlieb

On the evening of July 2/3, S.F.A.A. Members Joel Goodman, Irving Hochman, Rick Decker, Charlie Stifflemire and myself were treated to a spectacular viewing of the occultation of a bright mag 5.5 star by Saturn and its ring system at the Fiddletown observatory in the Sierra foothills. To view such a rare occurrence we had trained on Saturn eight scopes including a fine 6" reflector, C-8, a computerized 10" Schmidt-Cassegrain, a C-11, three large Dobsonians of 16", 17.5" and 20" and finally a 20-inch binocular dobsonian!

The event kicked off at 11:00 PM as Saturn's A ring passed in front of 28 Sagittarii and an immediate dimming was visible although the star was easily seen. Just a couple of minutes later an abrupt brightening was seen as 28 Sag shone through narrow Encke's division. Throughout the A ring occultation, subtle and obvious brightenings and dimmings were visible as the star passed behind denser matter. At 11:13 the star reached Cassini's division (which was easily visible in all scopes around the whole ring), and returned to full brightness. We were surprised, though, that the star was not visible through the bright B ring which was reached a few minutes later. 28 Sag returned to view as it reached the C or Crepe ring. This much darker inner ring showed up distinctly in the C-11 and was even visible in my 17.5" stopped down to 6" aperture.

A real surprise was in store as the star reached the globe of Saturn as a remarkable series of dimmings and brightenings occurred as 28 Sag passed behind the non-homogeneous upper atmosphere of Saturn. It was not until 1:30 that the star returned on the opposite limb of Saturn and the same sequence of events occurred in reverse!

(Continued on page 10)

July 2 was perhaps the best Star Party this year : skies were clear, telescopes were numerous, astronomers were hungry ! I missed viewing the Spring galaxies of Leo and Coma Berenices, hence my observing list was heavily favored toward the western sky--Unfortunately many objects sank too low too early to afford good viewing, therefore my observing list was almost useless (I won't make that mistake again) ! "Seeing" was less than ideal. Upper atmosphere disturbance made viewing Saturn disappointing. Saturn did rise higher and the atmosphere settled down a bit later in the evening. Several of us searched for Neptune--only a half a degree from Saturn and in opposition to Earth. We found a good candidate--a grayish-green disk--But no sign of Triton (Neptune's largest moon) which should have shown up on my 17½ inch reflector.

Everybody was a-buzz about Saturn's occultation of a fifth magnitude star the following night: Praying for a fogless San Francisco and better "seeing" conditions. I watched it in The City, and was not disappointed, "Seeing" conditions were slightly better than the night before. I glimpsed Cassini's division off and on with my 10½ inch homebuilt Dobsonian, not to mention the haunting effect 28 Sagittarii had flickering through the rings !

HOLOGRAPHY EXHIBIT - by Carl Trost

Over 200 astounding holograms are on exhibit at Fisherman's Wharf. See some of the large, classic laser transmission holograms. Priceless Russian museum pieces are on exhibit, but the show cases are nothing more than flat glass plates on the wall --- unbelievably realistic reflected-light holograms. There are videos explaining what holograms are and how they are made. Don't miss the telescope and microscope that you can look through. In the profusion, it is easy to overlook a small, black-and-white hologram labeled "Trisha II," a remarkably crisp stereo hologram produced from 120 photos.

Images In Time & Space, Pier 45, Fisherman's Wharf, 10 am to 8 pm daily through August 31. \$6.00. For info: 567-5655

NEXT STAR PARTY AT MT. TAM - AUGUST 26

Our next regular star party at Rock Springs is on August 26. In conjunction therewith, there will be a public astronomy program sponsored by the State Park Rangers in the Mountain Theatre. Ron Smith of Santa Rosa Junior College will be talking on "The Milky Way". Here's a chance to learn something about our very own galaxy and then go out to see it for yourself.

We will meet at 7 pm at the Shoreline Shopping Center in Mill Valley and caravan up the mountain together. Bring your family, friends, telescopes, binoculars and spend the evening. When you leave the star party, remember to turn on your headlights BEFORE you leave your parking space. SAFETY FIRST!

Within the past year I've constructed a 10½ inch F8 Dobsonian, helped fellow member Douglas Wolfe with a 4 inch Dobsonian Rich-Field, and, just recently, completed a knock-downable Surrurier truss 17½ inch F4.5 Dobsonian. In fact, this last telescope attracted so much interest on Mt Tam., that I decided to write this article.

"Bright Moments", as I've dubbed this telescope, features quick knockdown features : Truss tubes held in place by a wedge and clamp method and the use of draw bolts which enables the rocker box and mirror box to come apart into manageable pieces. I used large half-circle altitude bearings and extensive use of high-grade plywood to keep the weight down. I am pleased with the result : A large telescope that fits in my Subaru sedan and takes only ten minutes to set up (by myself).

My 10½ inch F8 Dobsonian ("space pistol") posed a different set of problems. With a 7.5 foot telescope tube, I wanted the Dobsonian base to be extraordinarily stiff while keeping the center of gravity low. I used MDF (medium density fiberboard)--brand name "medite"--to construct the rocker box and ground board. MDF has several advantages over plywood : it is more rigid (stiffer), it accepts screws (in all directions), it is moldable, i.e. you can round an edge or curve a side, it accepts paint well, and it is inexpensive (about \$ 15 a 4x8 sheet. Its one distinct disadvantage is that it is heavy--almost twice as heavy as plywood. For the 7.5 foot tube, I weighted the mirror end (to keep the center of gravity low) and used luggage-style draw catches to separate (while in transport) the mirror from the main tube. During transport the tube rides on a simple plywood cradle-like rack which attaches easily to my "Yakima" brand roof rack. Perhaps you have seen my "space pistol" or through it on Mt Tam.--I covered the tube with star charts and painted the rocker box faux marble.

Although I have no shop of my own, I am a cabinet maker/woodworker by trade--certainly an advantage in telescope making. Even so, most work was done in my garage using hand-power tools. Few of my ideas are original--I have gleaned them from my trade as well as other telescope builders. If you need free advice, help, or inspiration, give me a call - hell, I might even loan you my tools... 665-8639 Ray.

THE NEPTUNE FLYBY

It's not too late to sign up for PLANETFEST '89 sponsored by the Planetary Society during the week of August 23-27, 1989, at the Pasadena Convention Center in Southern California. Highlight of the celebration will be the transmission of live images from Voyager 2 as it encounters Neptune, the ring arcs and its moon Triton, together with hourly updates by scientists from the Jet Propulsion Laboratory. It should be tremendously exciting and almost like being part of the mission. For more information call (818) 793-5100.

COMET COMMENTS

07-10-89

By Don Machholz

Recently we've had three returning comets recovered and a new one discovered. In our Seeking Comets Section we'll discuss comet observations and how to make them. Most comet hunters spend at least some time observing known comets.

Periodic Comet Du Toit-Neujmin-Delporte (1989L): Jim Gibson of Palomar recovered this comet on May 22 at magnitude 18. It has an orbital period of 6.3 years and will be closest the sun, at 1.7 A.U., this October. It will not get much brighter.

Comet 1989m (SMM 8): This is the eighth sungrazing comet to be found by the Solar Maximum Mission satellite. It was observed for nearly two hours on June 2, then it apparently hit the sun and disappeared. It was magnitude 0, and was probably part of the Kreutz sungrazing group.

Periodic Comet Gehrels 2 (1989n): Jim Gibson also recovered this comet on June 14 at magnitude 19. It will be closest the sun in November, perhaps at magnitude 15.

Periodic Comet Brorsen-Metcalf (1989o): Finally recovered on July 4 by Eleanor Helin using the 48" Schmidt at Mt Palomar, this comet was 15 degrees from its expected position and 15 days early. Then at magnitude 11, it will continue to brighten, reaching magnitude 6 in early September.

This newly-calculated orbit suggests that the Southern Hemisphere will lose it in mid-August. The Northern Hemisphere observers can see it rise before morning astronomical twilight until late September. When it emerges from solar glare (for both Hemispheres) in early November it should be difficult to see at magnitude 11.5. No one will probably see it in October.

The comet rapidly moves through the morning sky. It will go only as far north as 42 degrees, passing through the Milky Way and central Auriga in mid-August. It should sport a tail during the next few months.

EPHEMERIS

Periodic Comet Brorsen-Metcalf (1989o)

DATE (UT)	RA (1950)	DEC	RA (2000)	DEC	ELONG	SKY	MAG
07-28	02h30.9m	+31°47'	02h33.9m	+32°01'	79°	M	8.6
08-02	03h20.7m	+36°43'	03h23.9m	+36°54'	73°	M	8.1
08-07	04h21.4m	+40°25'	04h24.8m	+40°32'	65°	M	7.7
08-12	05h28.5m	+41°56'	05h32.0m	+41°58'	57°	M	7.3
08-17	06h33.3m	+40°59'	06h36.8m	+40°56'	49°	M	7.0
08-22	07h29.3m	+38°07'	07h32.7m	+38°01'	43°	M	6.7
08-27	08h14.9m	+34°09'	08h18.1m	+34°00'	37°	M	6.4
09-01	08h52.1m	+29°39'	08h55.2m	+29°27'	33°	M	6.1
09-06	09h23.5m	+24°53'	09h26.4m	+24°40'	29°	M	6.0
09-11	09h51.2m	+20°51'	09h54.0m	+19°47'	25°	M	6.1

SEEKING COMETS

Comet observing, that is, estimating the magnitude (brightness), size and appearance of known comets, employs a greater number of dedicated amateurs than does comet hunting. This not only supplies valuable information for comet research, but also gives the potential comet searcher an idea of what he should be looking for. I've always felt that anyone wishing to seek comets should first become familiar with the objects themselves- to observe not just the bright comets, but the faint ones as well.

A "comet observation", when properly pre-planned, can be completed in a few minutes. It consists of an estimate of its brightness (mag. est.), coma size, appearance and tail length and direction. I'll cover each briefly, more details are available in numerous observing guides, or from me.

For a magnitude estimate, the comets brightness is visually compared to stars of known brightness. We never compare it to galaxies or nebulae. The stars' magnitudes are often available in catalogs or from variable star charts. Here are the three most common methods of estimating comet magnitudes. Each requires a various amount of racking in and out the focuser:

- 1) Bobrovnikoff: Compare the out-of-focus comet to the out-of-focus stars.
- 2) Sidwick: Compare the in-focus comet with the out-of-focus stars.
- 3) Morris: Compare the slightly out-of-focus comet to the out-of-focus stars.

Each will give a slightly different result, so be sure to record the method and source of star magnitudes. Also, since the telescope affects your estimate too, record your instrument size, type, focal ratio and power. It is also important to note sky conditions and comet altitude.

Next we estimate the size of the coma, or head of the comet. One way is to use the known separation of two stars, but a more accurate method is the "drift" method found in most observing guides. This is measured in arcminutes.

The "Degree of Condensation" is an indication of appearance. The coma is rated from "0" to "9", with "0" indicating a very diffuse appearance, "5" means it is diffuse with condensation (brightening near the center), while "9" indicates stellar or sharp-edged.

Most comets do not exhibit a tail, but if one does, we need to measure its length (reported in degrees to the nearest tenth) and direction, also known as the "Position Angle". This is taken from the center of the coma to the end of the tail; 0 degrees = N, 90 degrees = E, etc.

When many such reports of a comet are made over a period of months, its behavior can be analyzed. If this sounds like the type of comet observation you would enjoy, if you would like to join the hundreds of amateurs around the world who are advancing our knowledge of comets, get started now. Periodic Comet Brorsen-Metcalf needs to be observed tonight.

Don Machholz (408) 448-7077

Planetary Nebulae in Delphinus, Sagitta and Vulpecula

1020 RAMONA AVE
ALBANY, CA. 94706
2111 RESEARCH DR #5
LIVERMORE, CA 94550

by Steve Gottlieb
and Dr. Jack Marling

The constellation of Vulpecula is well known for the Dumbbell Nebula, M-27. This giant and bright planetary nebula is a favorite among Deep-Sky observers. Nevertheless Vulpecula itself and its two small neighboring constellations of Sagitta and Delphinus are the home for a total of 22 planetary nebulae. One third of these planetaries are fairly bright NGC/IC Planetaries already plotted on the Tirion Sky Atlas 2000.0. The remainder are more obscure or recently discovered planetaries that are little observed or perhaps even have never been observed before visually. To try to find these, it is generally best to first plot them on a Sky Atlas 2000.0 using the epoch 2000 Coordinates given in the table below.

<u>Name</u>	<u>2000.0 Coordinates</u>	<u>Size</u>	<u>Mag.</u>	<u>Brightness</u>	<u>Nucleus</u>
A 54	19h 08.7, +22° 59	73x62"	> 16.6p	≥ 16.5p	?
A 57	19h 17.1, +25° 37	40x34"	16.6p	14.9p	17.6
A 59	19h 18.7, +19° 34	94x80	16.8p	≥ 16.5p	?
K 3-34	19h 24.1, +25° 19	11x9"	~16.7p?	12.8p	?
He 2-437	19h 33.0, +26° 53	16x3"	16-18?	12-14?	?
M 1-71	19h 36.6, +19° 42	5x3"	13.9±1	7.9	?
A 63	19h 42.2, +17° 05	40x27"	15.9p	15.0p	14.7
M 2-48	19h 50.5, +25° 55	10x6"	16-18?	13.8p	15.9
NGC 6842	19h 55.1, +29° 17	57"	13.1	13.0	16.0
NGC 6853	19h 59.6, +22° 43	480x340"	7.3	11.4	13.9
A 68	20h 00.2, +21° 43	42x34"	15-16?	15.0p	13.3
WeSb 5	20h 01.7, +19° 55	155x150"	15.8p	17.5p	17.4p
We 1-9	20h 09.1, +26° 27	26x23	16-17?	15.1p	21
NGC 6879	20h 10.5, +16° 55	5"	12.5	7.0	15p
He 1-5	20h 12.0, +20° 20	29"	16.0	14.4	8.9
NGC 6886	20h 12.7, +19° 59.7	9"	11.4	7.2	15.7
NGC 6891	20h 15.2, +12° 42	15"	10.5	7.5	11.4
He 1-6	20h 17.3, +25° 22	18x13"	15-16?	14.0p	?
IC 4997	20h 20.2, +16° 45	2"	10.5	2.7	14.3
NGC 6905	20h 22.4, +20° 06	44x37"	11.1	10.2	14.0
A 72	20h 50.1, +13° 34	161x117"	13.8	15.6	16.1
A 74	21h 16.9, +24° 10	870"	10.8p	16.5p	17.1

In the table the size is given in arc-seconds. The brightness is the magnitude of the planetary if it were a disc 60 arc-seconds in diameter. The nucleus is the yellow (v) magnitude of the central star and is close to the actual visual magnitude. Where photometric data exist in professional literature, JM was able to derive the actual visual magnitude given above. For some planetaries only a photographic or blue magnitude is available, designated by a "p" after the magnitude. The visual magnitude is often brighter by 0 to 1½ magnitudes.

Abell 54: Discovered by George Abell in 1955, this is the 54th object in a list of planetary nebulae he published in 1965. The given photographic magnitude of 16.6 was derived from old 103a-0 blue plates of the Palomar Sky Survey. This photographic emulsion has very weak sensitivity to the strong Oxygen-III lines which contribute most of the visually seen light of planetary nebulae. Thus the visual magnitude can be 0.5-1.5 magnitudes brighter than the photographic magnitude. Nevertheless, Jack reports a negative sighting with a 17.5" Newtonian and we are not aware of any positive sightings to date.

Abell 57: This 1955 discovery is located near the Lyra border and has almost 2 magnitudes higher surface brightness than A-54. Using my 17.5" Dobsonian on July 22, 1987 I found "with an O-III filter at 140X, a faint, moderately large disc is visible steadily with averted vision and it can be viewed with direct vision. A star is close south-east. The estimated visual magnitude is 14.5-15.1."

Abell 59: Another Abell discovery found by examining the new Palomar Sky Survey in 1955. Abell 59 is large but has a very low surface brightness. Both of us had negative results with 17.5" and 13.1" scopes. If you want to give this planetary a try, it is located near the variable star U Sagittae, close to a double star plotted on the Tirion Sky Atlas 2000.0.

Kohoutek 3-34: Discovered in 1964, this small 11" planetary has little known data other than its 12.8 photographic magnitude surface brightness. The integrated magnitude is only about 16, so good luck! Jack reports a negative sighting with a 17.5" and the use of nebula filters. Look for it 3 minutes of right ascension preceding the open cluster NGC 6800 and let us know your results.

Henize 2-437: Discovered by astronomer-astronaut Karl Henize in 1964, little is known about this 16" diameter planetary other than an approximate 12th magnitude red surface brightness. It may be too dim to be seen visually due to its small size and low integrated magnitude. The authors would be interested in any positive or negative sightings.

Minkowski 1-71: This planetary is number 71 in a list published by Minkowski in 1947. This very compact planetary is about 14th magnitude visually. Look for it 2 minutes of R.A. east of the 5th magnitude star 9 Vulpeculae. Try "blinking" for it by sliding a UHC or OIII filter in and out in front of your eyepiece. M1-71 will be the faint star that seems to get brighter when the filter is used. On July 26, 1985 using a UHC filter on his 17.5" scope at 150x, Jack noted "found by blinking, 14th magnitude stellar object, 1.5 minutes following 9 Vulpeculae." The following month I observed this compact planetary with my 13" and recorded it as "mag 13.6-14.0, stellar at 144x, confirmed by the blink method, slightly non-stellar at 357x. A mag 9 star is 5'SSW.

(Continued next month)

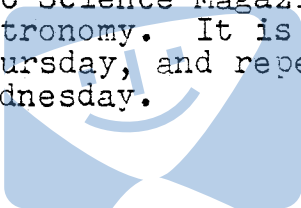
WHAT'S THE BIG ATTRACTION? - by Carl Trost

At the May meeting Dr. Joseph Silk mentioned the Great Attractor, a surprising discovery of the 1980's. If the Hubble expansion velocity is subtracted from the velocity of our galaxy and its neighbors, they seem to be converging at 600 km/second on a point about 40 megaparsecs away, in the direction of Centaurus, as if drawn by an incredible force.

The next morning BBC Science Magazine (a radio program) discussed a recent article in nature. Astronomers have made a three-dimensional plot of galaxies and found that there is a concentration of galaxy clusters ranging from 40 to 200 megaparsecs away, in the direction of Centaurus. The main concentration is at 140 megaparsecs, about three times as far away as the supposed Great Attractor. To determine if these galaxies might be the cause of the attraction, it must next be determined if there are galaxies out beyond 200 megaparsecs that are being pulled in.

A recent program discussed a wild, new theory that our galaxies are actually being repulsed by a "wall" or "crack" in space, according to Albert Stebbins and Michael Turner of UCSB. The new theory derives from inflation theory, the push that overcame gravity with phase transitions in space-time during the Big Bang. As BBC Science explained it, this phase transition represents a sort of latent heat of the universe that is released, driving the expansion, and is similar to latent-heat transitions and the cracks that appear in an ice cube when it is dropped into a drink. A second phase transition a million years later might explain the puzzling behavior of neutrinos. There is no evidence that this is the "Great Repeller," but it should show up as a difference in the background radiation in the region. The issue may be resolved next year by the Cosmic Background Explorer.

BBC Science Magazine regularly carries feature items on astronomy. It is broadcast on KALW, 91.7 fm, 9:30 am Thursday, and repeated 11:30 am Saturday and 3:30 am Wednesday.



Smile

Transparency was quite good that evening as Uranus was a fairly easy naked-eye object and I recorded a naked-eye star on the Tirion atlas as faint as mag 6.4. In addition to the show that Saturn and 28 Sag put on, Neptune was visible in the same low power field just 30' to the north-east. By further coincidence, Neptune's brightest moon Triton was at eastern elongation (still only 15" separation at best and pretty faint at magnitude 13.5) and was clearly seen in my 17.5" at 280X. Triton is the most distant moon in the solar system visually observable and I was thrilled just to glimpse it as we will soon be treated to close up views this month of Neptune and Triton as Voyager 2 flies past the system on August 25. Other treats included the extremely faint central star of the ring nebula which was just at the threshold of visibility in the 17.5" and a remarkable amount of filamentary structure in the Veil Nebula at 84X. The 2 nights of observing under such gorgeous conditions as these definitely made up for some disappointing recent months!

LICK OBSERVATORY REOPENS FOR VISITORS

After being closed for extensive renovations, Lick Observatory has reopened for visitors. From 7 to 11 on Friday evenings through September 8, the observatory's 40" reflector and 36" refractor are available for public viewing. Admission is free, but reservations are required. To ask about available space, call (408) 429-2495.

BOARD MEETING

The next meeting of the SFAA Board of Directors is on Wednesday, August 9, at 8:00 pm in the library of the J.D. Randall Museum. All members are invited to attend Board meetings to contribute their ideas and suggestions.

BULLETIN CONTRIBUTIONS

As always, the Bulletin welcomes your announcements, letters to the editor and articles on astronomy. Send them to: SFAA Bulletin, C/O Jim Shields, 190 Chilton Avenue, San Francisco 94131. The deadline is the 18th of the month.

SFAA MEMBERSHIP BENEFITS

Membership dues of \$15 per year include the monthly SFAA Bulletin and free entry to all club activities, such as lecture meetings, star parties, summer picnics, etc. In addition you may obtain subscriptions to several astronomy publications at greatly-reduced rates. Please contact Chelle Beard at 32 Penhurst Avenue, Daly City 94015. Telephone 878-4965 evenings.

We arrived at the Kestner Observatory after some trial and error (detailed directions are a requisite for first-timers) to find three other stalwarts (Steve Gottlieb, Charlie Stifflemire and Rick Decker) and a veritable banquet of instruments to satisfy even the most voracious telescopist's appetite. Topping the cast was Rick's 20-inch Dobsonian binoculars! Yes folks, I mean a pair of 20-inch mirrors with collimated eyepieces for true binocular vision, rendering breathtaking views of deep sky objects. Then there was Steve's meagre (by comparison) 20-inch monocular Dobsonian, to say nothing of Charlie's 16-inch Dobsonian and 11-inch and 10-inch Schmidt-Cassegrains. My anemic 6-inch Newtonian and Irv's 8-inch Celestron seemed superfluous amid this wealth of glass. Just in case we ran short, there was always the Kestner 23-inch and sundry smaller instruments in storage, but at the ready. We were clearly armed to the teeth for the task at hand.

As darkness deepened that night, our appreciation of the atmospheric clarity at Fiddletown grew. The southern sky was inky black clear to the horizon, and vividly etched against it was a brilliant Milky Way. As soon as it was dark enough to spot Saturn in the evening twilight, all telescopes were trained on the ringed planet. Sure enough, there was 28 Sagittarii, a brilliant diamond west of the ring system. We watched the distance diminish, and then, right on schedule at about 11:00 pm, the star dimmed abruptly as it moved behind the evanescent F Ring, which is invisible from terrestrial-based telescopes, marking the onset of the occultation. Gasps and cries of delight pierced the quiet countryside as 28 Sagittarii went through a rapid series of dimmings and brightenings. Anyone within earshot might easily have imagined that an orgy was taking place, and in a sense one was. However, no gendarmes appeared during the course of the night.

The occultation was, indeed, a spectacle to remember. 28 Sagittarii remained visible throughout its passage behind Ring A, even in my 6-inch telescope, brightening dramatically as it crossed Encke's Division, a delicate and difficult feature even in large observatory telescopes, but apparent in the images from the Voyager spacecraft. The star brightened to full splendor as it entered Cassini's Division, which was easily seen in the clear night sky. After traversing Cassini's, 28 Sagittarii disappeared behind the denser Ring B, where it remained invisible even in the 11-inch Celestron, which we all agreed gave the best views of the phenomena. It finally emerged from behind Ring B and passed behind the gossamer Crepe Ring, which was clearly visible in even the 6-inch. I believe that the image of the star, in full splendor, nestled between the rings and the globe of Saturn will be forever etched in my memory. After spending almost two hours behind Saturn, 28 Sagittarii reappeared and did an encore on the eastern side of the planet, finally moving clear of the ring system at about 3:30 am on July 3. While the star was behind the planet, we took advantage of the big Dobsonians and the clarity of the sky over Fiddletown to gather unforgettable views of the complex filamentary structure in the angular, wispy Veil Nebula, the dark lanes of the Trifid and Lagoon Nebulae, and the glittering, majestic M13, the great star cluster in Hercules. Some of us even swore we glimpsed the central star in the Ring Nebula (in Lyra), a very faint and difficult visual object, but captured in long exposure photos.

After catching a few hours sleep, we awoke to a bright, sunlit morning, packed our gear and headed homeward, a little richer for the experience.

San Francisco Amateur Astronomers

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



CLASSIFIED ADS

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

WANTED - Small lightweight rich field refractor such as Televue Oracle or Brandon 80mm f/6.3 apochromat. Call Jim Shields at 565-4088 evenings or weekends. (2)

FOR SALE - SKY ATLAS 2000.0, new laminated Field Edition from AstroSystems, \$25. Call Steve Gottlieb at 525-7968.

Smile