



SAN FRANCISCO AMATEUR ASTRONOMERS

Sharing the Wonders of the Universe

September 1992

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The SFAA Board of Directors meets on the second Wednesday of each month at 8:00 PM at the Randall Museum, 199 Museum Way, San Francisco. All Club members are welcome at Board meetings.

The SFAA Bulletin is a forum in which club members may share their ideas and experiences in astronomy. We encourage you to participate and welcome your letters, sketches and articles on astronomical subjects. Please send your contributions to: SFAA Bulletin Editor, 190 Chilton Avenue, San Francisco, CA 94131. Deadline is the 18th of the month before publication.

Contrasting Styles

The San Francisco Amateur Astronomers holds regular lecture meetings on the third Wednesday of each month at 8:00 PM at Morrison Planetarium, California Academy of Sciences, Golden Gate Park. On **September 16** the guest speaker will be Professor Max Dresden of Stanford University and the Stanford Linear Accelerator. The title of his talk is *Contrasting Scientific Styles of Physicists and Astronomers*.

Professor Dresden has had a long and distinguished career in the field of particle physics. He received his M.A. from the University of Amsterdam, M.S. from the University of Leiden and Ph.D. from the University of Michigan. Before coming to Stanford he held faculty positions at the Universities of Kansas and Iowa, Northwestern University and the Institute for Theoretical Physics in Stony Brook, New York. He has been a visiting professor at universities and laboratories around the world.

Professor Dresden is a fellow of the American Physical Society and the American Association for the Advancement of Science. He is a past president of the history division of the American Physical Society and a member of its Council. He has authored four books and won several teaching awards.

Annual Club Picnic

The SFAA will hold its annual picnic on Saturday, **September 19**, beginning at 3:30 PM, at Briones Regional Park in Orinda. Lew Epstein will provide hot dogs, hamburgers and buns. Bring your telescope and a beverage, salad or dessert to share. (Suggestions: lemonade, potato salad or cole slaw, cake or cookies.) This is a fine opportunity to renew old friendships and make new ones. Check page six of this issue for a map and directions to Briones Regional Park.

Mount Tamalpais

The next star party at Rock Springs on Mount Tamalpais is on Saturday evening, **September 26**. At **8:00 PM** Robert Sheaffer of the Bay Area Skeptics will be speaking on *The UFO Verdict* in the nearby Mountain Theatre. Bring along your family and friends, binoculars and telescopes, knowledge and love of the night sky to share with other SFAA members and the general public after the lecture.

Yosemite

It was an easy trip from San Francisco through beautiful countryside. The Rangers were expecting us the weekend of August 7-8 and had reserved a fine group campsite a few miles from Glacier Point. About 18 SFAA members and a few guests brought along at least nine telescopes. The largest was John Muhilly's 16" open tube Dobsonian.

Days were warm, lazy and very pleasant, conducive to hiking as well as snoozing. One didn't need a telescope to be awed by the grandeur of Half Dome, Nevada and Vernal Falls. These things have a powerful way of reinforcing one's sense of insignificance.

Evenings were cool, turning to nippy, then cold but bearable. The Moon was sensational, especially with a moon filter. Saturn was simply spectacular at high power through a C-8. Bright moonlight interfered considerably, but the Ring Nebula and Andromeda Galaxy were fine sights nonetheless. One of the most satisfying sensations was hearing a visitor break out with a loud and awestruck, "**Oh, WOW!!**", after looking through the eyepiece at Saturn or the Moon.

It was a very congenial group, with lots to eat and drink. Special thanks to Loretta Botta, Pat Sargent, Chelle Beard and Marianne Levenson for great food and organization, and to Bob Levenson for arranging the whole deal at the Park. I'm ready to do it again next year.

—Irving Hochman



A Perfect Astronomy Holiday

If you've been an SFAA member for any length of time, you've probably been tempted by the announcements and articles about the *Practical Observational Astronomy* course offered by San Francisco State University at its **Sierra Nevada Field Campus** every year. Having just completed the course the last week of July, I now know what I've been missing all these years: a perfect astronomy vacation.

Don't leave your non-astronomer *significant other* at home, either. There are plenty of day hikes in the gorgeous setting of the Sierra Buttes, with streams and lakes to go *a fishin'*, *a swimmin'* or *a gold-pannin'* in. The living is easy on campus. The shower and bathroom facilities are excellent. The meals are simply **superb!**

The class itself is geared to beginners. In the afternoon Professor Jim Peters explained the motions of the sky, celestial coordinates, universal time, the use of setting circles, etc.

The class started up again after dinner at our observing site a few miles away. Here participants learned the summer constellations and estimated the magnitudes of variable stars. They used various telescopes to find, describe and draw deep sky objects. More experienced amateurs helped out in the process, and also helped beginners to understand what they were seeing, explaining, let's say, the evolutionary difference between an open and a globular cluster. (This is a wonderful place to refine one's explanatory skills among truly interested, interesting students.)

Yes, the students really were interesting people: one was an M.D., two were teachers, one a musician, at least one a poet. They all had curious minds.

The class is not just for beginners. If you think of yourself as an *advanced* amateur, hang out with Steve Gottlieb and Jim Shields for a week and see how much they can teach you. They both possess the knowledge of a pro combined with the enthusiasm of a novice.

Fremont Peak

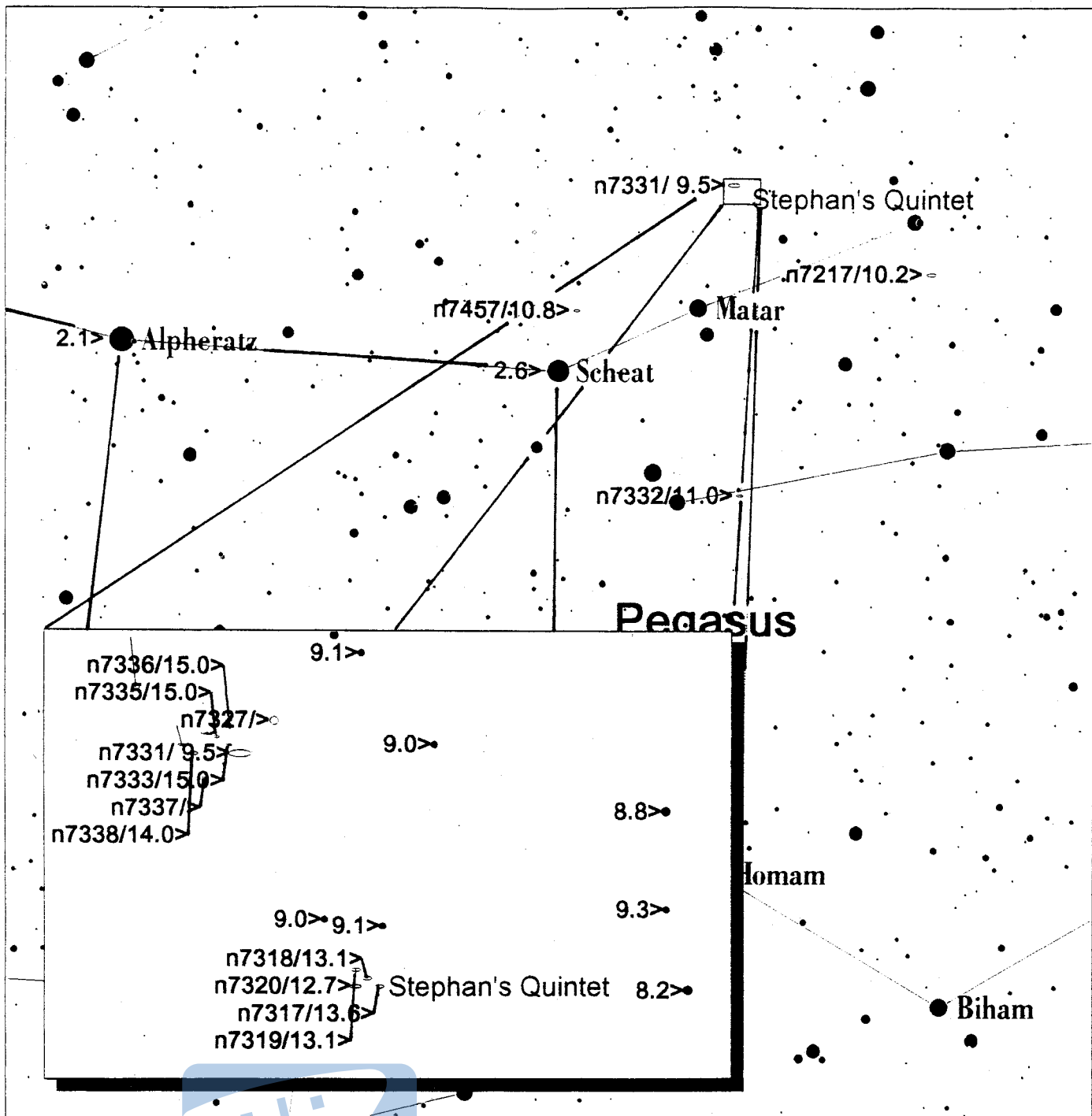
Just two hours south of San Francisco, overlooking the historic, quaint mission town of San Juan Bautista, is Fremont Peak State Park. Astronomers in the Bay Area know Fremont Peak as the site of a beautiful observatory housing a truly impressive amateur instrument: a 30" equatorial reflector.

Devoted to public education, the Fremont Peak Observers Association (FPOA) allows its members (\$10 annual fee) to reserve the observatory for private use, provided they help with public observing sessions at least once a year. SFAA members that also belong to the FPOA include Dennis Tye, Ira Stein and myself. It was Dennis that graciously reserved the 30" telescope for SFAA members' exclusive use the evening of July 24.

About a dozen club members and guests made the trip. I don't think anybody was disappointed! What did we see?...the central star in the Ring Nebula...spiral structure and HII regions in M33...a spiral turn and a half in the Whirlpool...a lot of detail and color in the Saturn Nebula.

The group in attendance made for an especially memorable evening. There was Dave Evans with his beautifully-crafted 10" Dobsonian; Joel Goodman with his optically near perfect 6" Cave reflector; Michel Kotski with his usual exuberance; Dan Smiley; Jim Webster; Cheryl, Rich, Rose and family; and of course, Dennis—Thank You!

—Ray Cash—Le Penne



STEPHAN'S QUINTET

Stars:

- 9.5 ● 5.0
- 9.0 ● 4.5
- 8.0 ● 3.8
- 7.5 ● 3.1
- 7.0 ● 2.8
- 6.0 ● 2.5
- 5.6 ● 2.0
- 5.3 ● 1.0

NGC Objects:

- Galaxy
- Open Cluster
- Globular Cluster
- Planetary Nebula
- Nebula
- Cluster+Nebulosity
- Star
- Other NGC Objects

Solar System Objects:

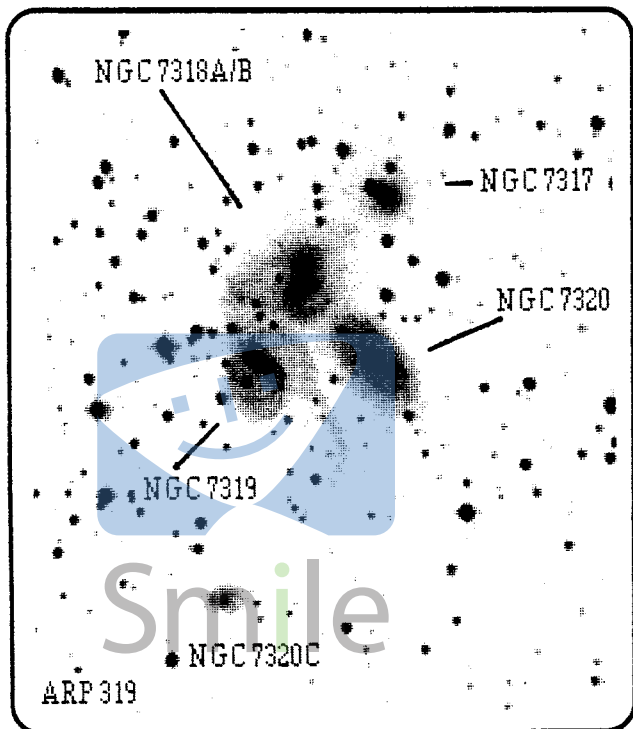
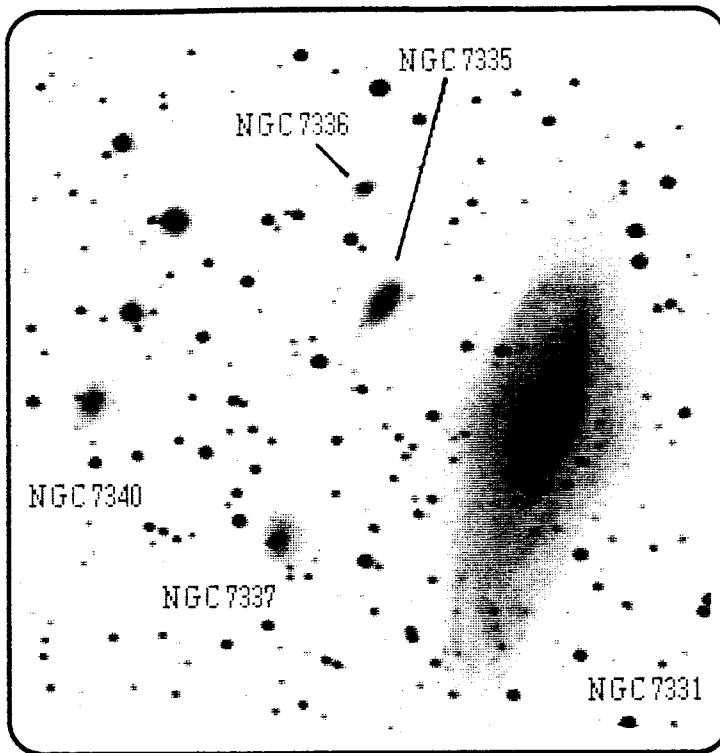
- ☉ Sun
- ♁ Mercury
- ♀ Venus
- ♂ Mars
- ♃ Jupiter
- ♄ Saturn
- ♅ Uranus
- ♆ Neptune
- ♇ Pluto
- ☾ Moon
- ☄ Comet
- ♁ Asteroid

Center @ RA:23h05m06s Dec:+21d28'02"

On The Trail Of Stephan's Quintet

The Great Square of Pegasus dominates the eastern sky in late September. Northwest of the square lies a thin pencil of light, NGC 7331, an edge-on spiral galaxy that would resemble M31 if the Great Galaxy in Andromeda were 25 times further away! Look for a dust lane and HII regions in larger amateur telescopes. NGC 7331 is the first and biggest step on the trail leading to Stephan's Quintet (Arp 319).

While you're in the neighborhood, have a look for four faint companions just east of NGC 7331. At magnitudes from 14 to 15, they won't be easy even in a large scope. Use the photo above to identify them. (North is up in the 12 arcminute field.) Although the RNGC lists nine objects in the field of NGC 7331, the other five are double stars, misidentifications or simply non-existent, according to an article in the Fall 1986 issue of *Deep Sky* by Jeff Corder and Steve Gottlieb.

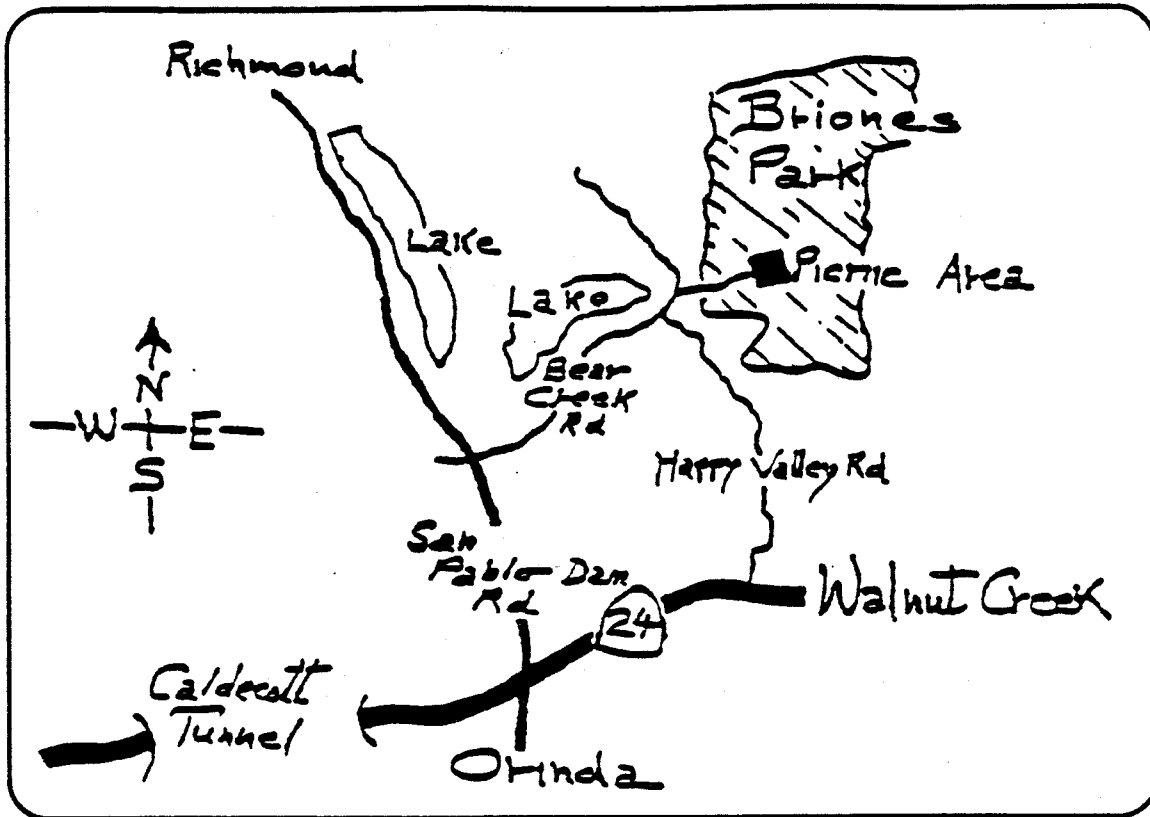


Nudge your telescope about 1.5 degrees southwest from NGC 7331. Take your time and do some careful looking for the most famous of all galaxy groups. Use the photo at left to orient yourself in the telescope field. (North is to the left; the field is once again about 12 arcminutes.) The brightest galaxy in the group, NGC 7320, shouldn't be too hard to spot; the faintest and probably the toughest will be NGC 7317. Can you split the double galaxy, NGC 7318 A/B?

Congratulations! Finding a tough challenge object like Stephan's Quintet should give you a great feeling of accomplishment, and a renewed feeling of awe at the spectacle of nature.

—Jim Shields

ANNUAL CLUB PICNIC



Take Highway 24 through the Caldecott Tunnel. Take the Orinda exit and turn north (left) on San Pablo Dam Road. Continue for about two miles, then turn east on Bear Creek Road. Approximately four miles down the road, you will see a sign for Briones Park Bear Creek Picnic Area. Get ready for a feast!

WANT ADS

Members' advertisements for astronomy gear are free and will run three times. Just send your ad to SFAA Bulletin Editor, 190 Chilton Avenue, San Francisco 94131. Please notify the bulletin editor if an item is sold so that it may be deleted. This service is provided to club members only on a space-available basis.

- ◆ For Sale: New hardcover books—A Portfolio of Lunar Drawings by Harold Hill, \$30; Observing Visual Double Stars by Paul Couteau, \$20; Men from Earth by Buzz Aldrin, \$15. Call Jeff Felton at 564-7082.
- ◆ For Sale: Restored 1970 V.W. Camper. \$2,800. Call James at 221-6004.
- ◆ For Sale: Unitron Model 142 three-inch equatorial refractor with accessories. Excellent first scope, especially for city viewing. \$575 or best offer. Call Tom at 474-8992.

COSMOLOGY BEFORE COBE

Joel W. Goodman

The recent excitement generated by the COBE satellite's finding of irregularities in the background microwave radiation brought to mind how our cosmological perspective has evolved during this century. We knew little about the nature of the universe and our modest place in it until the 1930's when Edwin Hubble discovered the *red shift* in the spectra of galaxies, which indicated that other galaxies were receding from us. He reasoned that the displacement of spectral lines was proportional to recessional velocity and since fainter, presumably more distant, galaxies showed greater red shifts than brighter specimens, recessional velocity was apparently proportional to distance. This landmark discovery permitted estimates of galactic distance and even of the age of the universe, based on the *Hubble Constant* which, parenthetically, has been anything but constant. An obvious and immediate outgrowth of the red shift was that the universe is expanding, much like the surface of a balloon during inflation. Hence the *Expanding Universe* theory was born.

These matters stood until the late 1940's when three British astronomers, Fred Hoyle, Herman Bondi and Thomas Gold, proposed a *Steady State* universe without beginning or end. Popular folklore has it that the idea was conceived after they had seen a horror film, "Dead of Night", with a circular plot in which the end arrived back at the beginning. I dimly remember seeing that film in my youth and thought it clever and entertaining, but I must confess that it failed to inspire any theories of the universe for me, surely my own shortcoming. In any event, the Steady State universe offered the intellectually satisfying advantage of not requiring a universe with a beginning or an end, thus avoiding such imponderable issues as "what came before?" and "what will come after?". On the other hand, it had to contend with its own contentious issues, such as the continuous creation of matter to form new galaxies, which was never satisfactorily explained, or an acceptable explanation for the red shift. A steady state universe should appear essentially the same everywhere, without galaxies rushing from one another at pell mell velocities. Extrapolating the red shift back in time brought all matter to a single point, the *Superatom*, an embarrassment for steady state advocates. Nonetheless, proponents of the two cosmic theories scoffed at each other, Hoyle coming up with the appellation "Big Bang" for the expanding universe concept. It was intended to be deprecating but was eagerly adopted by the other camp and the term has stuck to this day.

Both sides held fast until 1964, when the steady state was dealt a mortal blow. Two Bell Laboratory scientists, Arno Penzias and Robert Wilson, found that they were unable to rid their radio antenna of microwave noise. Moreover, the noise was the same intensity regardless of the direction of the antenna. They were sufficiently aware of the possible significance of their observations to show them to astrophysicists Robert Dicke and James Peebles, who had themselves been attempting to find the background radiation predicted by the Big Bang. The shock waves generated by the Penzias-Wilson discovery had an immediate impact on cosmological thinking because background microwave (thermal) radiation was inconsistent with the steady state concept but fit beautifully with an expanding universe initiated by a big bang.

COBE delivered another, and perhaps final, nail in the steady state coffin. Theory predicted irregularities in the background microwave radiation in order to seed gravitational clumping of matter into galaxies within the accepted time frame of the age of the universe (10-15 billion years). Without such

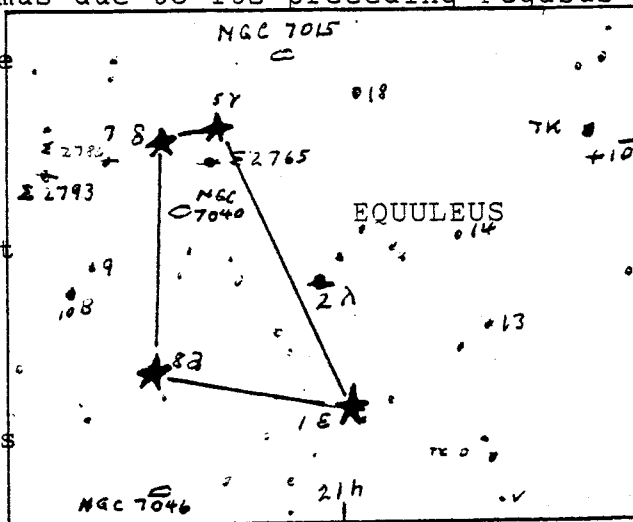
seeding, the universe as we know it today could not evolved so rapidly. The problem was that the irregularities are so minute that they are technically difficult to detect and earthbound attempts to obtain this all important verification of the Big Bang had been frustrated. COBE was designed to attack this problem and succeeded in spectacular fashion by recording the predicted non-uniformity, providing the most compelling evidence in support of the Big Bang since the discovery of the background radiation almost three decades before.

EQUULEUS, THE LITTLE HORSE -- By Gordon Ridley

Equuleus, the second smallest constellation of the 88, with only 72 square degrees of sky, is located halfway between the head of Pegasus and Delphinus, the Dolphin. Equuleus is marked by a trapezium of 4th and 5th magnitude stars, making it a faint constellation as well, but well-known due to its location adjacent to Pegasus. The first mention historically of Equuleus was when the Rhodian astronomer Geminus, in 77 BC, mentioned it as being one of 49 constellations listed by Hipparchos in his famous "Catalogue" in the second century B.C. Later, astronomers such as Ptolemy and others called it Equus Primus due to its preceding Pegasus in rising. Later, from its inferior size comes our own title of Equuleus, the little horse, or foal, with the larger horse being Pegasus.

At first look Equuleus does not appear to offer much to amateurs, their being no bright stars or famous deep sky objects. Nevertheless Equuleus offers some very interesting double stars that will be a very good test of your ability to split them. Also, Burnham's

Celestial Handbook does not indicate any galaxies, but they are there, albeit faint, at mag. 14 and 15. Several are listed below. Can you find them when next you go observing?



<u>Subject</u>	<u>Location</u>	<u>Magnitude</u>	<u>Separation</u>	<u>Notes</u>
1 ε Equ	20h59m+04°	{ 6.0 & 6.3 7.1	1.0" @ 285° 10.7" @ 70°	White and Blue 200 LY distant
2 λ Equ	21h02m+07°	7.4 & 7.4	2.8" @ 218°	
MM 2765	21h11m+10°	8.4 & 8.6	2.8" @ 81°	
2786	21h20m+10°	7.2 & 8.3	2.5" @ 185°	
MM 2793	21h25m+09°	{ 7.8 & 8.3 8.5	0.4" @ 229° 26.6" @ 242°	A tough split
			<u>Diameter</u>	<u>Galaxies</u>
NGC 7015	21h05m+11°	13.2p	2.0' x 1.8'	Sb+ Galaxy
NGC 7040	21h13m+09°	15p	1.1' x 0.8'	Small & Elongated
NGC 7046	21h15m+03°	14.2v	2.0' x 1.5'	SBC Galaxy

Dear Editor,

I was unhappy to read Jim Webster's account of observing on Mt. Tam on May 30. First, I sympathized with Jim that he had a bad evening, but additionally I realized that many club members who do not observe at Tam may have the impression that his experience is typical. May I present another view.

I have attended three of the four public programs held so far this year, and my experiences have been very favorable. The crowds for the lectures have been sizeable, but not at all over-whelming, the largest being approximately 150 people on May 2 and again on August 1, and both of those nights there were 15 to 20 telescopes available for viewing. All three evenings I attended, the speakers went over time, so most of the public did not arrive at the telescopes until about 9:45pm to 10:00pm. Maybe it was because I don't have much aperture, or because I set up in the area marked off by the rangers with most of the other observers, or maybe just by luck, but I did not get the "*jerks, bores, or boobs*" Jim encountered. I greatly enjoyed talking to and sharing my small scope with some interested and interesting people. Some even ask how to join the club! And all the public left by 11:00pm. All three nights afforded good observing with the summer fog blocking out the city. Even though the mountain was open all night to observers, I observed only until 3:00am, giving me 4 hours of viewing with other club members, after the public left.

I do concede that astrophotographers and members with pre-planned observing programs, or those with large aperture seeking darker skies, preferring less crowded conditions, and willing to drive further, will find a site like Sugar Loaf much more appealing than Mt. Tam. However I encourage all members who enjoy the comraderie of the group, don't mind being a cosmic tour guide for about an hour, and find proximity to the city an important factor, to come to Mt. Tam and judge the site for yourselves. I personally have been observing there since the early 70's, and I really love the mountain.

One last thought. Some members may not realize that the Mt. Tam star parties are sponsored by the park and open to the public in lieu of the club's having to purchase liability insurance. Several devoted SFAA members register as park aids, taking over responsibility from the rangers and the MTIA volunteers when the public leaves at 11:00pm on program nights (April-Oct) and being fully in charge on non-program nights (Nov-March). If a portion of some of my evenings on Mt. Tam must be devoted to public education in order to assure the continued use of the site by amateurs, it is a price that I am willing to pay. I hope that other members concur, and will continue to enjoy observing on Mt. Tam.

Tinka Ross

Make checks payable to San Francisco Amateur Astronomers and mail to:
 Treasurer, San Francisco Amateur Astronomers, 32 Penhurst Avenue, Daly City 94015.
 Founded in September, 1952, the San Francisco Amateur Astronomers (SFAA) is an association of people who share a common interest in astronomy and other related sciences. Our membership consists of people from all walks of life, educational backgrounds and ages. Many SFAA members own their own telescopes; some have been made by hand in local telescope-making classes and vary in size from six to 25 inches diameter.

- Select one category:
- \$20 enclosed, individual membership
 - \$20 enclosed, foreign membership
 - \$25 enclosed, family membership
 - \$25 enclosed, institutional membership
 - \$5 enclosed, youth membership (under 18)

Name: _____
 Address: _____
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SAN FRANCISCO AMATEUR ASTRONOMERS
MEMBERSHIP APPLICATION

**San Francisco
 Amateur Astronomers**

c/o Morrison Planetarium
 California Academy of Sciences
 Golden Gate Park, San Francisco, CA 94118

Features

- ★ Summertime Observing
- ★ On the Trail of Stephan's Quintet
- ★ Cosmology before COBE
- ★ Equuleus, the Little Horse
- ★ In Defense of Mount Tam