The Refractor

The Bulletin of the Eastbay Astronomical Society

Founded in 1924 at Chabot Observatory, Oakland, California

Volume 74
Number 11
July 1998

Stars in the Valley of the Moon

Saturday, 11 July, 1998

News and Short Presentations, 7:31 p.m.

Lecture 8:20 p.m.

Chabot Observatory, 4917 Mountain Boulevard, Oakland

George Loyer

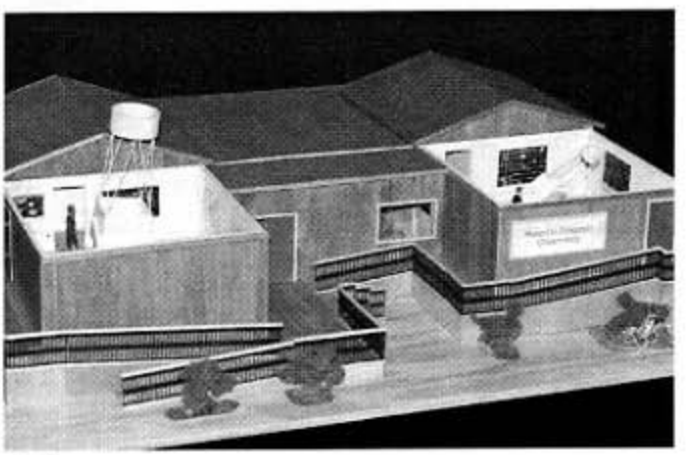
President, Valley of the Moon Observatory Association

How to Build a Public Observatory for Next to Nothing: The Ferguson Observatory at Sugarloaf Ridge State Park.

Asked for some brief biographical information, George Loyer modestly states, "I'm just a guy who likes to look at the sky and hang out with other folks who like to do the same." In addition, of course, George is a board member of the Sonoma County Astronomical Society, a software company manager, a writer, telescope maker, and observer. Most of all he is the driving force that brought the Ferguson Observatory Project from imagination in 1995 to first light in 1997.

"This will be the story of building an observatory in a State park from donated materials for the building and the telescopes, just because we promised to open it to the public and to enhance the education of the community with it when it was done. It's a story that isn't complete yet, and the rest of it will be told by all of the individuals who put their enthusiasm for astronomy at the service of others who can take a moment to experience the awe of looking at the night sky."

The project is named for the late Bob Ferguson, an enthusiastic supporter of public astronomy programs and an inspiration to all who met him. Bob was a tireless presenter of astronomy, one who was at his best when he was trying to build a fire under a class of bored elementary school kids. His experience with children gave him the idea of building a few telescopes that could be given away to kids who needed a spark to add to their own enthusiasm for astronomy. That was the start of the "Striking Sparks" program which has been run annually since 1985 by the Sonoma County Astronomical Society and which has put over 100 telescopes into the hands of kids aged 5 to 18. This photograph shows Bob working with Striking Sparks winners some years ago.



This model of the Ferguson Observatory at Sugarloaf Ridge State Park near Kenwood, California, shows how the two sliding-roof observing rooms will be joined by a meeting room, library and office. Shown on the left, phase one of the project, opened in February, 1997, houses a 40-inch reflector. Phase two of the project will build the second observing room and the classroom and is slated for groundbreaking in September, 1998.

EAS Adopts Mission Statement

At the meeting of the Board of Directdors on June 11, the purpose and goals of the Society were reaffirmed with the approval of a summation of those principles. The wording of the statement is as follows:

The Eastbay Astronomical Society is committed to the promotion of a greater community interest in the science of astronomy and to the dissemination of technical and scientific information on the subject.

A fundamental method for accomplishing this goal is to participate actively in programs to teach the principles of

Continued on page 4

Join us for

DINNER WITH THE SPEAKER

5:28 p.m., Saturday, 11 July, 1998

PEARL OF SIAM RESTAURANT

5498 College Avenue, Oakland (510) 420-8600

Please call Betty Neall at 510 / 533-2394 by Friday, 10 July to confirm your place. Please be on time to allow ample time for dinner and to facilitate a prompt meeting time of 7:31 p.m.

Ophiuchus, the Snake Charmer

is the thirteenth of the twelve constellations of the Zodiac. It is the forgotten constellation, perhaps, for the Sun actually spends more time before the stars of Ophiuchus (19 days) than it does in neighboring Scorpius (6 days). Also, the stars in this area of the sky are less than magnificent. There are only four stars that exceed a rating of magnitude three. Alpha, Ras Alhague, is a magnitude 2.1 star somewhat less than midway on the line from Vega toward Antares. Eta Ophiuchi, Zeta, and Beta follow at 2.6, 2.7 and 2.9 magnitude. These stars can be found above Scorpius and below the stars of Hercules. Aquila is to the east. The center of the constellation crosses the meridian at about eleven p.m. in early July.

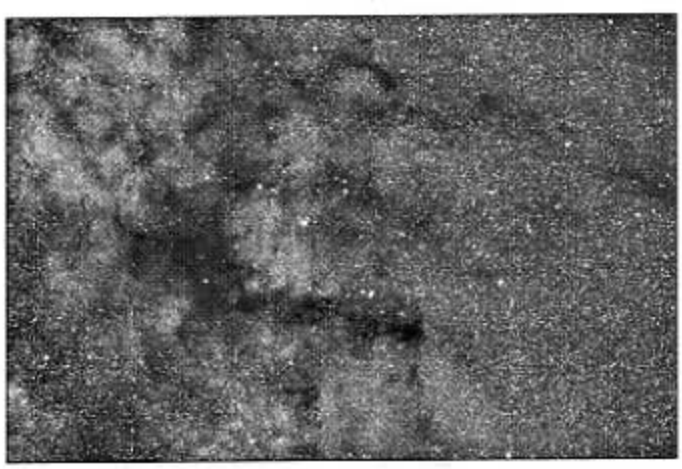
For binocular viewing there are six star clusters in this area of the sky, all with Messier numbers: 9, 10, 12, 14, 19 and 62. Another, M107, is dimmer and would require a telescope for study. Still other globular clusters exist in this region, making 22 in all.

A number of double stars are here, too, including Sabik (η-Ophiuchi), a pair of third-magnitude stars separated by one second. 70-Ophiuchi is another interesting multiple star, which José Olivarez considers in his column on the next page. The colors of the stars are said to be yellow and purple. This star system was discovered in 1779 by Sir William Herschel. It is part of an olden asterism made up with other stars in this region of Ophiuchus. The stars form the letter V that suggests the Hyades in Taurus, the Bull. In 1777, a Polish astronomer, Abbé Poczobut of Wilna, asked the French Academy to honor the last Polish king, King Stanislaus Poniatowski, with a constellation. The designation did not last, however, although "Poniatowski's Bull" may still be found on some star charts.

Æsculapius was an immortal man who had been schooled by the centaur Chiron in the arts of botany and medicine. So he was knowledgeable of the various herbs and plants and a student of nature. One day, it is said, he was in the house of a friend when he killed a snake. He watched in astonishment when another snake slithered into the room with a particular herb in its mouth and with it restored the slain reptile to life. Recognizing the plant, Æsculapius soon had learned to use its mystical powers to heal the sick and resurrect the dead. It is from this history and from the ability of a snake to cast off its skin and assume a new revitalization that serpents have become symbols for healing. The staff of Æsculapius, with a snake coiling about the rod, is well known in today's medicine. Unfortunately, this symbol is often confused with the caduceus of Mercury, which is a doubly-winged wand entwined by two snakes. Truly, however, this is the symbol of messengers.

Æsculapius, the first doctor, sailed on the famous voyage of the Argonauts in search of the Golden Fleece. Following the journey, he continued to heal the sick and to advance the practice of medicine. On the death of Orion, he was about to attempt to restore the life of this great hero when Pluto, lord of the underworld, intervened. Pluto reasoned that his realm would decline if Æsculapius were allowed to revive the dead. He appealed to his brother Jupiter to agree that death should be the ultimate end of mortal man, not to be trifled with even by the most skilled of physicians. Jupiter, king of the gods, struck Æsculapius with a thunderbolt and ended his life on Earth. But in tribute to the accomplishments and skill of the great physician, Jupiter placed him among the stars, where today he is known as Ophiuchus, the Serpent Bearer.

Antiquated star maps show a larger constellation, depicting the physician clutching the serpent that wraps about his body or shoulders. Now, however, the serpent itself is represented and is given two identities. Stars to the west are those of the head, Serpens Caput, while the tail section, Serpens Cauda, writhes eastward toward Aquila, above the shield of Scutum.



From the crisp, clear skies of the "Legendary White Mountain Star Party" last summer, Axel Mellinger photographed the Pipe Nebula south of θ-Ophiuchi, above the tail of Scorpius. He used a 135-mm lens and Kodak Ektapress Multispeed PJM film.

One of the most interesting objects that you can't see in Ophiuchus is the Pipe nebula. On dark, clear nights you won't see it because this absorption nebula lies in front of the spectacular Milky Way. It is one of the largest dark-cloud formations that can (cannot?) be seen from the Northern Hemisphere.

Ophiuchus, not so well known as neighboring Scorpius or Sagittarius of the Zodiac constellations, has much to draw your attention during summer evenings.

Roberts Rules

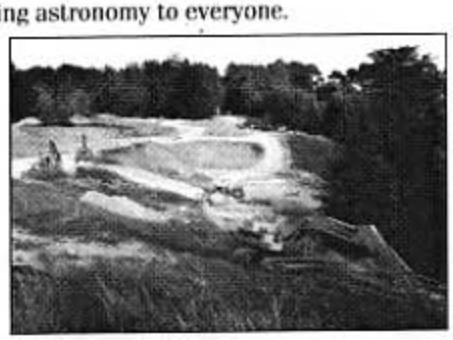
By Carter Roberts

As announced at the June meeting of the EAS, Chabot Observatory & Science Center finds it imperative to reduce the extent of its public programs during the interim until the new facilities are open. Many factors went into this decision, among them the loss of availability of the telescopes as they are physically moved to the new site. COSC is, of course, cognizant of its mandate to serve the citizens of Oakland and will endeavor to offer a public presence to East Bay families. To support this goal, the EAS Board of Directors has sent to COSC a resolution that promises our assistance. It says:

The EAS will promote the public programs, subject to approval of wording and content of flyers, will work on improved signage to help accomplish this goal, and will provide volunteers to staff the telescopes Friday and Saturday nights in association with staff as required.

In addition, the Board has recommended that COSC include extended fund-raising promotions with each public program, encouraging everyone to become part of this exciting new venture. Anticipating that there cannot be planetarium presentations each weekend, EAS will invite the public to its lecture meeting, which will be restructured to include a short segment of more general interest, while retaining the customary technical lectures. Visitors would then be welcomed to view through the Chabot telescopes, or, on dismantling for moving, through portable telescopes.

As a side note Don Stone points out: During the Civil War, the United States Government was in the process of restoring the dome above the rotunda of the Capitol. Many legislators pressed President Lincoln to abandon the project. "No," he said, "It is important that the nation see that we have faith in the future. Abandon the project and they will think that we are losing the war." History records the fact that the dome was restored and the North won the war. Think of "Old" Chabot as being the dome and "New" Chabot as the "war." We cannot afford to let the public think we have lost heart and that we do not care to continue the 115-year old tradition that is Chabot Observatory's service to the public. We must do all we can to continue, uninterrupted, bringing astronomy to everyone.



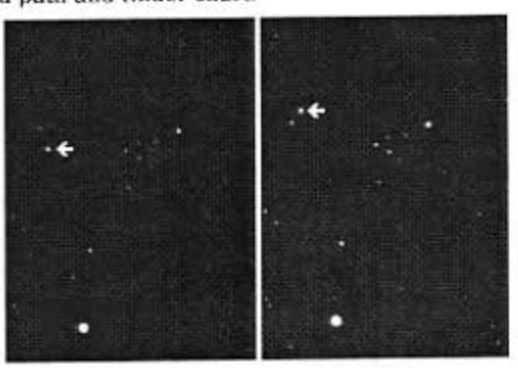
The photo, taken June 20, shows that the new facilities for the Chabot Observatory are actually in progress. This view is from the vantage point of the planned observing courtyard and looks across what will be a corner of the west building to the circular trench for the foundation of the Megamax Theater. Contractors were scheduled to pour concrete beginning July 1.

Any who wish to join the group going to the White Mountains later this month should not delay in calling Dave Rodrigues at (510) 483-9191. You'll get no finer opportunity to take astrophotographs such as those of Axel Mellinger—see page 2.

José's Observations

by José Olivarez

Barnard's Star. During a human lifetime, the stars appear fixed to their places on the celestial sphere with no change that can be perceived by naked-eye or telescope. But there are some exceptions and two of the best exceptions lie in Ophiuchus. These are Barnard's Star (a "runaway star") and 70 Ophiuchi (a rapidly orbiting binary). Barnard's Star is the star with the largest known proper motion (the apparent angular movement of a star across the sky in a year). It was discovered by Edward Emerson Barnard in 1916. The star moves so fast (at 10.29 seconds of arc per year) that it only takes 180 years for its motion to cover half a degree relative to the background stars. Barnard's Star is a red dwarf and lies 5.94 light years away at R.A. 17h 58m, Dec. +04°44'. At magnitude 9.5, the star is too faint to see with the naked-eye, but it is well marked on star atlases for easy identification. For example, its large proper motion is dramatically represented on chart No. 1273 of the Millennium Star Atlas where Barnard's Star is identified. The large apparent motion of Barnard's Star is the result of its nearness combined with its unusually high space velocity of 103 miles per second, according to Burnham's Handbook. If you decide to peek at this remarkable "runaway star", look in Volume II of Burnham's Celestial Handbook for a detailed starfield path and finder chart.



The motion of Barnard's Star over a period of ten years is shown in this pair of photos from Lick Observatory. North is up in these images; Barnard's Star is moving toward the north.

70 Ophiuchi—A Rapid Binary. Fourth magnitude 70 Ophiuchi is one of three stars that form a little triangle in northeast Ophiuchus. It lies at R.A. 18h 06m, Dec. +02°32'. 70 Ophiuchi is an attractive binary whose apparent separation varies from 6.7" to 1.7" in a period of 87.85 years. Since the first measurements were made, 70's companion of magnitude 5.9 has completed two revolutions around its primary. The current separation of the pair is 2.9 seconds, so it takes high power and good seeing to adequately split them now. But at 16 light years distance, 70 Ophiuchi is close enough to permit the observation of an actual change in the orientation of the orbiting companion. So, here again careful observers can detect a change in the position of a star in a matter of a few short years. What's more, 70 Ophiuchi is a close neighbor of Barnard's Star, making it easy to keep a watch on these rapid stars!

Chabot Observatory

Public Programs for July

Closed July 3 and 4 for the Independence Day holiday, the planetarium shows will continue on Friday and Saturday evenings through August 1 with the "Liquid Nitrogen Show." The presentation will be followed with "The Sky Tonight" planetarium program and observing through the telescopes.

Liquid nitrogen is a fascinating substance for its properties at –320°F, and in this program we'll see what happens to common objects that are cooled to this temperature. You'll be amazed to see the air we breathe in liquid form. We'll also experiment with hydrogen, the most abundant element in the Universe. Learn where these elements came from, and witness a mini "Big Bang."

Because seating is limited, you should reserve your tickets in advance by calling (510) 530-3480 ×36. Student admission is $3.50 (ages 6-17); seniors $4.50. General admission tickets are $5.00. Shows begin at 7:30 p.m. The Starry Nights gift shop will be open before and after the show, where you can find many science-oriented items, books, and software.

Public Astronomy Programs

are hosted by Mount Tamalpais State Park in Marin County, in association with San Francisco Amateur Astronomers and the Astronomical Society of the Pacific. Lectures are held at 8:30 p.m. in the Mountain Theatre near Rock Springs.

The talk to be given on July 25 is by EAS member Norm Sperling and is titled "Oxymoronic Astronomy." Norm lectures at Morrison Planetarium at the California Academy of Sciences and also teaches at Merritt College and at Sonoma State University. As a break from the usual serious astronomical talks, this one touches some much lighter notes–a humorous look at astronomical words whose meanings turned out to be wrong, and quotations from hilariously mistaken students.

Directions: From either 101 South or 101 North, take the Highway 1/Stinson Beach exit. After approximately three miles on Highway 1, turn right on Panoramic Highway. After approximately five miles, turn right at Pan Toll Road. Proceed towards summit, after 1.5 miles you will come to a "T" intersection. You can park at the paved lot here. There is a short walk from the parking lot up to Mountain Theatre.

Call the State Park for more information at (415) 388-2070.

EAS Mission Statement *Continued from page 1*

astronomy, as well as an awareness of the night sky, to children of the San Francisco Bay Area in cooperation with other organizations. The Society will support the public programs of the Chabot Observatory to the full extent of its capacity.

The Society also is committed to offering technical assistance in operating and maintaining the instruments and equipment of the Chabot Observatory & Science Center, of whose parent Joint Powers Agreement it is a member.

The Society is determined to express its leadership among organizations with similar goals by taking an active role in sponsoring such key programs as the lessening of light pollution.

The Society will endeavor to serve its members by providing a forum for the discussion of matters of interest in the fields of astronomy, space sciences, earth sciences, and meteorology. It will encourage its members in their individual accomplishments in pursuit of astronomy-related goals, such as astrophotography, optics, observing, education and community service.

A Call for Action

EAS volunteers are asked to assure that the Chabot telescopes will continue to be available to the public on a regular schedule from now until the instruments will be relocated to the new COSC site in Joaquin Miller Park.

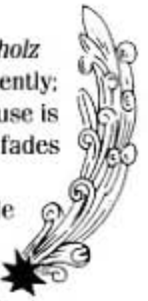
Anyone who can communicate with people, particularly with youngsters, and who has a basic knowledge and interest in astronomy is asked to commit to at least one night each month until the end of the year. Depending on your experience and desires, you will assist directly with the operation of the 20-inch and 8-inch telescopes. Or you can help in any of a number of other ways in consideration of your other skills–your help will be welcome no matter what level those skills may be. You will be working under supervision of COSC staff, and training will be provided.

The observatory will be open to the public on Friday and Saturday evenings, and there may be other times when special events will require help. It is anticipated that there will be an orientation meeting for volunteers about the middle of July for work assignments that will begin about August 1.

Please contribute your time and talent by leaving a message for Conrad Jung at his voice mail: (510) 530-3480 ×31. This should also be considered a rare opportunity for you to learn the behind-the-scenes operations of the historic telescopes.

As reviewed in the front-page article, the mission of the Eastbay Astronomical Society is to promote greater community interest in the science of astronomy. Let's do it!

Comet Comments *by Don Machholz*



Several faint comets have been discovered recently; they will remain dim. Meanwhile Comet Stonehouse is fainter than magnitude twelve and Comet SOHO fades in the southern sky.

Jean Mueller discovered a new comet while conducting the second Palomar Sky Survey. Comet 1998 K1 (Mueller) was found in the northern evening sky at magnitude sixteen and will not get closer to the Sun than 3.7 AU.

The Lincoln Laboratory searches the sky for asteroids and is quite successful in finding them. Within the past month it found three asteroidal objects which upon close inspection reveal a tiny coma. Often these comae are only a few arc-seconds across. One object showed no coma at all, but a tail 19 arc-seconds long. These three comets are designated C/1998 K2 (LINEAR), C/1998 K3 (LINEAR), and C/1998 K5 (LINEAR).

Comet Hunting Notes: At what declination (number of degrees north or south of the equator) do amateur astronomers visually discover comets? The finds range from +72 degrees to −62 degrees. From 1975 to the present, of the 43 comets found in the Northern Hemisphere, seven were found north of +45 degrees. Sixteen were between +20 and +45 degrees and the remaining 20 were found between the celestial equator and +20 degrees. As for the 34 southern comets, five were found south of −45 degrees while 16 more were between −20 and −45 degrees. The remaining 13 Southern Hemisphere comets were found between the celestial equator and −20 degrees.

Date (00UT)	R.A. (2000)	Dec.	Elong.	Sky	Mag.
C/1995 O1 (Hale-Bopp) [Puppis-Carina]					
07-01	06h21.4m	−50°44'	74°	M	10.4
07-06	06h26.3m	−51°06'	74°	M	10.5
07-11	06h31.2m	−51°30'	74°	M	10.5
07-16	06h36.0m	−51°57'	74°	M	10.5
07-21	06h40.8m	−52°26'	75°	M	10.6
07-26	06h45.5m	−52°58'	75°	M	10.7
07-31	06h50.0m	−53°33'	76°	M	10.7
C/1997 J2 (Meunier-Dupouy) [Pegasus]					
07-01	22h23.4m	+26°58'	106°	M	11.4
07-06	22h20.2m	+26°08'	111°	M	11.3
07-11	22h16.5m	+25°09'	116°	M	11.3
07-16	22h12.2m	+24°03'	122°	M	11.3
07-21	22h07.5m	+22°48'	127°	M	11.3
07-26	22h02.4m	+21°24'	132°	M	11.3
07-31	21h56.9m	+19°51'	137°	M	11.3
C/1998 J1 (SOHO) [Vela]					
07-01	08h28.1m	−39°23'	68°	E	10.3
07-06	08h44.3m	−41°33'	69°	E	10.7
07-11	08h59.8m	−43°27'	70°	E	11.1
07-16	09h14.9m	−45°11'	70°	E	11.5
07-21	09h29.5m	−46°46'	70°	E	11.8
07-26	09h43.7m	−48°13'	70°	E	12.2
07-31	09h57.6m	−49°35'	70°	E	12.5

Find a Comet, Get a Check!

IAUC 6936 announces the establishment of an award for amateur comet discoverers. The following text is taken from the Circular. Further information is available at http://cfa-www.harvard.edu/iau/special/EdgarWilson.html

This is to announce the establishment of and the criteria for the Edgar Wilson Award for the discovery of comets. The Award shall be allocated annually among the amateur astronomers who, using amateur equipment, have discovered one or more new comets. Only comets officially named for their discoverers shall be included in the annual count. Since particular recognition is to be given to the amateurs who discover the most comets, identical fractions of the total Award funds shall be allocated for each comet with an eligible discoverer, except that if the same comet is credited to more than one independent eligible discoverer, each discoverer shall receive a full fraction. If the discovery is made as the result of information produced or prepared by some other person, it shall not qualify for consideration.

Eligible discoveries may be made by visual, photographic or electronic means. The Edgar Wilson Award is international in scope and shall be administered by the Smithsonian Astrophysical Observatory. An observer who suspects he or she has discovered a comet shall ensure that his or her discovery report reaches the Central Bureau for Astronomical Telegrams (CBAT) according to the usual procedures. The CBAT shall maintain the necessary records and may contact the discoverers for eligibility documentation. To be eligible for the Award an individual must demonstrate that he or she is acting in an amateur capacity, at least for the purpose of discovering the comet, and that only amateur, privately-owned equipment was used for the discovery.

It is anticipated that the funds available for the first annual Award shall be approximately $20,000. For the purpose of this Award, a year shall be the period of twelve months beginning on June 11.0 UT. The first Award shall be for the year ending on 1999 June 11.0. The Award shall be announced and made during the month of July following the end of each period.

DATELINE JULY

4	1054	Chinese record supernova, precursor to Crab Nebula (M1)
22	1784	Friedrich Bessel, born, first to measure a star's parallax (61 Cygni)
19	1846	Edward Pickering, born, Director, Harvard College Observatory
18	1921	John Glenn, born, Cambridge, Ohio
20	1969	First Moon landing, Apollo 11
20	1976	Viking 1 landed on Mars
16	1994	Shoemaker-Levy 9 first impact on Jupiter
4	1997	Pathfinder landed on Mars
1	1998	First Quarter Moon, 11:41 PDT = 18:41 UT
9	1998	Full Moon, 09:02 PDT = 16:02 UT
16	1998	Last Quarter Moon, 08:14 PDT = 15:14 UT
23	1998	New Moon, 06:44 PDT = 13:44 UT
31	1998	First Quarter Moon, 05:04 PDT = 12:04 UT

You are invited to make your own telescope at the

TELESCOPE MAKERS WORKSHOP

Join our group each Friday evening at

Chabot Observatory

Call Paul Zurakowski for more details

(925) 447-6837

FUTURE CONJUNCTIONS

July

9	7:30 p.m.	EAS Board meeting
11	7:31 p.m.	EAS lecture meeting George Loyer Stars in the Valley of the Moon
23-27		White Mountains Star Party
25	8:30 p.m.	Oxymoronic Astronomy Norm Sperling

August

8	7:31 p.m.	EAS lecture meeting. TBA
13	7:30 p.m.	EAS Board meeting
22		Star-B-Que at Fremont Peak
26	7-11 p.m.	Star Party at Bort Meadows

✔ **Check our our Web Sites at:**

http://silcon.com/~eas

http://chabot.cosc.org/~eas

✔ The latest copy of *The Refractor* with images in color.

✔ Information about the **Eastbay Astronomical Society**

✔ Great astrophotographs by **EAS** members.

If you have photos you would like to have displayed on our Web page, please submit a .gif file, .jpg file or a color print to the editor, Ellis Myers. Phone (925) 284-4103. We would be happy to include your work.

Eastbay Astronomical Society

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