



The Refractor

The Bulletin of the Eastbay Astronomical Society
Founded in 1924 at Chabot Observatory, Oakland, California

Volume 78
Number 8
April 2002

2002 Eastbay Astronomical Society Annual Awards Dinner

Speaker: Charlie Petit – *On the Edge: A Writer's Attempt To Keep Up With The Scientific Frontier*

Saturday, April 6, 2002

Planetary Landscapes Hall, Dellums Building

Chabot Space & Science Center, Oakland

Doors Open 6:30 pm

Dinner at 7:30pm

In 1999, the AAAS (American Association for the Advancement of Science) awarded Mr. Petit their prestigious National Science Writing Award, saying “*Charles W. Petit also won for his articles Touched by Nature, A Fresh Jolt for Fusion and Rediscovering America, which appeared in U.S. News & World Report on July 27, 1998, September 28, 1998, and October 12, 1998. Petit is honored for his craftsmanship and the excellent quality throughout all three pieces. The judges said the entries represent a fine example of what others should strive for in science journalism.* It must be amazing, sometimes, being at the cutting edge of science as it happens. To be among the first to learn, for example, that the Americas weren’t necessarily populated from the prehistoric migrations of humans coming from what is now called Alaska (as had been previously supposed), or that engineers are starting to use computers to “evolve” better machine and software designs through a kind of simulated evolutionary “survival of the fittest” process. (Uh, oh! Ever see *Colossus: The Forbin Project*, or *The Terminator*?) Being able to interview the astronomers, astronauts, oceanographers, biologists, geologists, anthropologists, (and just about every other “gist” there is) who are on the forefront of discovery must put one in the condition of being regularly amazed, intrigued, and fascinated. Mr. Petit’s day job is to search out these stories, find out all the facts on them, and then tell his readers all about it. As our Dinner Speaker, he’ll tell us all about what it’s like to be there when science happens. ★



★★★WE DID IT★★★

ASTROLOGY DAY

April 20th is Astrology Day! Be sure to do the right thing and use this highly-accurate, computer-generated guide. And don’t forget your crystals and incense!

Aries (March 21-April 19): This is a great time for a Messier marathon! If anyone nearby is getting close to finishing before you, hit them with your head, *hard*.

Taurus (April 20-May 20): Finding those faint fuzzies can be difficult at times. Snort, glare, and paw the ground with your feet. It won’t really help, but you’ll feel better.

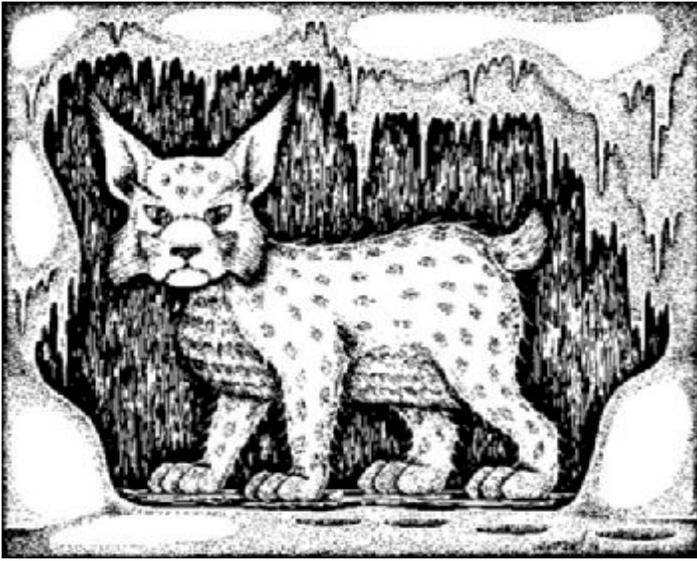
Gemini (May 21-June 20): There are two sides to you, but they’re both exactly the same. This works out to a zero net gain. Use that in negotiating with Plossels.

Cancer (June 21-July 22): You’re simply delicious when you get really boiled. Don’t let them crack you, or try to butter you up, though. You may regret it.

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Hevelius, Moonwatcher

By Ellis Myers

Johann Hewelke was a prosperous brewer in the busy port town of Danzig, in the mid-1600s. As a hobby, he became an amateur astronomer, built an observatory at his home, and became a keen observer. Only about 40 years after the invention of the telescope, he developed an atlas of the Moon. Having learned engraving in his youth, he did the illustrations himself, and created the best maps up to that time. This *Selenographia* was finished in 1647.

However, unsatisfied with the quality of his telescopic observations owing to chromatic aberration, Hevelius (this was the Latinized version of his name) began to make telescopes of increasingly longer focal lengths. At last he built a telescope with a focal length of 150 feet. This instrument was suspended from a 90-foot mast. Of course, this proved to be an impractical arrangement, for even the slightest breeze made it unusable. The mounting burned in the great Danzig fire of 1679. Then 68 years of age, Hevelius never again returned to productive astronomical observing. Hevelius died in 1687.

His star chart published in 1690 introduced seven new constellations, including Lynx. The others were Canes Venatici (the Hunting Dogs), Lacerta (the Lizard), Leo Minor (the Lion Cub), Sextans (the Sextant of Urania), Scutum (the Shield, first called Scutum Sobieskii, the Shield of John Sobieski, a Polish hero-king), and Vulpecula et Anser (the Fox and Goose, now just Vulpecula).

Lynx lies directly to the north of Gemini's bright star Castor. But there are no bright stars in the constellation itself. There is no asterism here, and the only pattern is of a wobbly line roughly parallel and somewhat north of an imaginary line



From *Selenographia*, 1647

traced from Capella in Auriga to Regulus in Leo.

Ceres, Goddess of Agriculture, had a beautiful daughter, Proserpine. But the girl was abducted, and Ceres searched throughout the world for her, without any trace. In despair, Ceres caused the crops to die, and she vowed never to let anything grow until Proserpine was returned to her. Ultimately, she learned that it was Pluto who had taken the girl and made her his queen of the underworld. When Ceres appealed to Zeus for justice, it was decreed that Proserpine would spend half the year with Pluto and half the year with Ceres. This is symbolic of the Winter, when nothing grows, and Summer, when ripe fruits are harvested. To return agriculture to normalcy, Ceres directed her protégé Triptolemus to drive her dragon-pulled chariot and strew seeds over all the soil. However, King Lyncus of Scythia was envious, for he wanted the credit of restoring the crops to fall to himself. Lyncus welcomed Triptolemus to his palace and treated him royally. But then, while the young man slept, Lyncus approached with a dagger to kill him. But Ceres suddenly changed the king into a Lynx and put him in the sky where the stars were so faint that nobody could see him unless they had the eyes of a lynx. Thus the reward for arrogance is insignificance.

Of a number of good multiple stars in the constellation, one of the best is the triple 38 Lyncis. A 3.9-magnitude star is accompanied by a 6.6-magnitude star 3 arc seconds distant and a third star 88 arc seconds away at magnitude 10.8.

A mid-sized telescope should enable you to resolve all three of the 5th, 6th and 7th mag stars in the triple system 12 Lyncis.

With a proper motion toward the west, the binary in Lynx known as 10 Ursae Majoris has moved from Ursa Major to Lynx but kept its old name. This star is a close visual binary with the pair spinning once every 21.9 years.

Deep sky objects in Lynx include the most distant of all globular clusters, about 200,000 light years away from the Sun. Actually farther than the Large Magellanic Cloud, this cluster, NGC 2419, has been considered by some astronomers to be outside the Milky Way, and it is sometimes called the Intergalactic Wanderer.

None of the individual stars are brighter than 17th magnitude, yet the total cluster achieves a magnitude of 11.5. A large cluster, with a diameter of about 400 light years, it shows only as a fuzzy spot in small telescopes, but large telescopes confirm it to be rich in stars; total cluster luminosity equals that of 175,000 suns.

A number of faint galaxies are in this part of the sky. The best is NGC 2683, a spiral galaxy which we see nearly edge-on, and so its spiral structure is difficult to discern. In true-color photographs, it shows a red color where dust on the nearer side of the galaxy obscures and reddens the light coming from the more distant side. The galaxy occupies an area about 9.3×1.3 arc minutes in size and shines at a magnitude of just under 10. ★



NGC 2683, edge-on spiral galaxy in Lynx, Photo by Mike Harms



Eastbay Astronomical Society

Seventy Eighth Anniversary Dinner

Saturday, April 6, 2002

Astronomy Hall

Chabot Space & Science Center

10000 Skyline Boulevard, Oakland, California



We will again be in the Dellums (west) building of CSSC, where the "Planetary Landscapes" exhibits are normally displayed. The doors will open at 6:30pm, and the dinner will begin at 7:30pm. Award presentations, door prizes, and lecture will commence at 8:30pm. Please enter Chabot by the MAIN ENTRANCE.

Our speaker this year will be **Charlie Petit**, and his talk will be:
On the Edge: A Writer's Attempt to Keep Up With the Scientific Frontier

What's it like to a science writer? To be at ringside for all the major scientific discoveries of the late twentieth and now the twenty-first centuries? EAS has the great privilege of having a science writer of international renown, Charlie Petit of U.S. NEWS and WORLD REPORT.

Charlie, formerly the science writer of the San Francisco Chronicle, has been writing about science for more than twenty years. He has been witness and chronicler not only to some of the last century's most important astronomical discoveries, but also to many of the scientific discoveries that have changed our lives.

Charlie will describe for us what his life is like, what it takes to be a good science writer, some of his most important stories, and some humorous anecdotes about the science info biz (like the time he wrote for the South Pole's newspaper). He'll describe how hard it is to keep up with the accelerating rate of discovery and to translate it into terms that the layman can understand and appreciate. He'll give us a behind-the-scenes view of those remarkable stories we've read about. Go to www.usnews.com/ and do a search for Charlie Petit; you'll be amazed at the level of his productivity!

So come to the Seventy Eighth Eastbay Astronomical Society annual dinner for what should be a fun and informative overview of the past twenty years in science!

This year's recipient of the **Helen Pillans Award** is **Dave Rodrigues**, our very own *Wizard of Astronomy* and *EAS Programs Director*, in recognition of his tremendous contributions towards the dissemination and promotion of astronomy to the public, and his hard work for our Society.

The dinner will be catered once again by Harry's Hofbrau, and will feature Roast Beef, Turkey, Ham, and Spinach Lasagne. This dinner has received rave reviews for the past six years! Cost per person is \$30. Please use the form below and send it in **no later than March 25th** to ensure your reservation. For more information, call Don Stone at (707) 938-1667 or email him at ddcstone@earthlink.net.

(Volunteers before the dinner starts to help set up will be greatly appreciated!)

EAS BANQUET SIGNUP FORM

(cut along dotted line)

Saturday, April 6, 2002

Number of guests: _____ x \$30.00 = \$ _____

Names of guests: _____

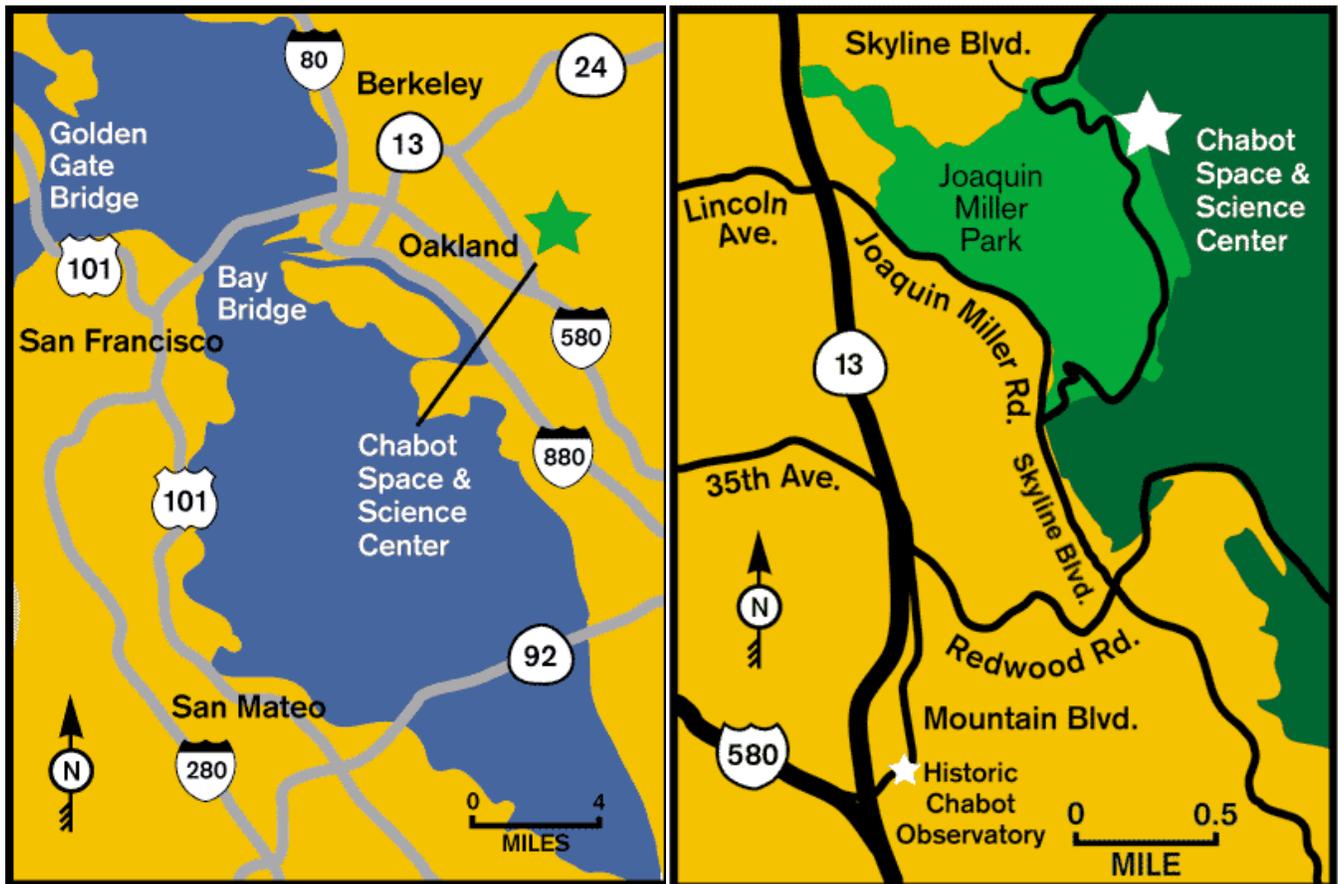
Phone: _____ Email: _____

Please make your check payable to **EAS** and mail with this form *before March 25th* to:

EAS Banquet – c/o Don Stone, 19047 Robinson Rd., Sonoma, CA 95476-5517

Eastbay Astronomical Society Annual Dinner

Chabot Space & Science Center
10000 Skyline Boulevard
Oakland, California
Saturday, April 6, 2002
6:30pm



Send in your banquet sign-up form in before March 25th!

Cont'd from Page 1

Leo (July 23-August 22): The Lion is your name, and pouncing on faint fuzzies is your game! Roar when you find them – chicks/guys dig it.

Virgo (August 23-September 22): Lounging around and looking pretty is what you do best. Let your admirers set up your telescope and find objects for you. You need but smile!

Libra (September 23-October 22): Staying balanced is your focus in Life. Beware! the Nagler 31mm Type 5 (aka, "the Pineapple") Have extra counterweights ready.

Scorpio (October 23-November 21): You have very strong persuasive abilities. Use this to promote astronomy. Or, join the vice squad and run sting operations.

Sagittarius (November 22-December 21): You're the kind of person who shoots straight arrows and serves tea. Consider joining the British Olympic Archery Team (when you're not looking for double stars and variables).

Capricorn (December 22-January 19): You like to meet challenges head on – that's a good thing. Be careful during star parties, though; it's very unpopular to charge around in the dark.

Aquarius (January 20-February 18): The weight of Life's necessities weighs you down. Take a break! Go visit a nice dark-sky site, and don't forget the hot chocolate.

Pisces (February 19-March 20): Things are going swimmingly for you, but beware! Avoid those "downstream" optics and stay with Tele-Vues or you'll be sorry! ★

Upcoming Events at Chabot Space & Science Center

By Denni Medlock

April 18th: Distinguished Lecturer: Dr. George Smoot, from the Lawrence Berkeley National Laboratory, speaking on, "When the Universe Sang: Harmonics of the Early Sky." Recent findings of the balloon-borne experiments MAXIMA & BOOMERANG, looking at the Cosmic Microwave Background, have remarkably agreed about what the "harmonic proportions" of the cosmos imply: not only is the universe flat but its structure is definitely due to inflation, not topological defects in the early universe. Tien MegaDome Theater at 7:30 pm. Tickets are \$5 and are available at the door. A dessert reception with the speaker follows.

April 20th: Celebrate Astronomy Day on April 20 with various activities, such as solar viewing, solar cooking, finding your birthday star, and constellation making.

April 21st: Earth Day! Lunchtime theater presentation by Franklin Elementary School entitled "What's For Dinner?" An entertaining look at the animal food chain. Throughout the day we will explore a variety of Earth-re-

lated topics, including solar energy production, watershed models, atmospheric experiments, native plant propagation and redwood ecosystem explorations.

On April 26, Kevin Keller will present a concert in the Ask Jeeves Planetarium. Keller, a well known synthesizer musician will use the backdrop of the Milky Way to take us outwards into the cosmos. Tickets are available through TicketWeb.com and at the front desk. 510-336-7373 for more information. ★

News Short: The Western Amateur Astronomers will present the G. Bruce Blair Award for 2002 to Dr. Mike Reynolds, Executive Director, Chabot Space & Science Center. The award will be presented on Saturday evening, May 25 at the RTMC Astronomy Expo at Big Bear Lake. For information and registration materials go to <http://www.rtmc-inc.org/>. ★

AUCTION XXII

When: Sunday, April 28, 2002, 1pm until done

Where: Houge Park, San Jose

Sponsored by: San Jose Astronomical Association.

Auctioneer: **Kevin Medlock** whose merciless evaluation of classical astronomical items makes for great entertainment!

Doors open at 12:00 PM to register and preview auction items. The club will accept only appropriate material for the auction so things run smoothly. A \$1 donation is required to obtain an auction bidder/seller number. No commission applied if items don't sell. After the Auction, buyers and sellers settle up using one check to (or from) SJAA and claim their items. Seller pays 10% commission, with a cap of \$50 for any one item. We do not handle charge cards.

After, unsold items will be displayed in the hall, around 3 PM or earlier. Buyers pay the sellers. Sellers pay the club a 10% commission for everything sold. There are no table fees. All commissions from the auction and the swap are tax-deductible, as SJAA is a 501(c)(3) educational organization. If you have a large item to sell, please email Bill Arnett at auktion@sjaa.net with a description and a photo of the item or a link to your own website for some pre-auction publicity. Directions:

From Hwy.17:

Camden Avenue exit, go east 0.4 miles
Turn right at the light onto Bascom Avenue
Turn left onto Woodard Road to next stop sign
Turn right onto Twilight Drive
Go three blocks, cross Sunrise Drive
Turn left into the park.

From Hwy.85:

Bascom Avenue exit and go north about 0.2 miles
Turn right at the first traffic light onto White Oaks Rd.
At stop sign, turn left onto Twilight Drive
Turn right at the first driveway, into the parking lot.

For questions on the auction, SJAA, or to view preregistered items, go to <http://www.sjaa.net> or email auktion@sjaa.net. ★

Editor's News 'n Views

Hey there! If you haven't done so, yet, clench your fist, shake it, and say, "YESSS!" (then grunt). Measure G passed muster, with a full 75% approval rating from the good people of Oakland. We needed at least a very hard to get two-thirds vote to make it, and we got a three-quarters vote, instead! Chabot's Volunteer Coordinator, **Karen Powers**, really put



her heart and soul into making it happen, as did all her volunteers, and the coordinators and volunteers from the other facilities (Oakland Zoo, and Oakland Museum). After months of getting signatures to get the measure on the ballot, then more months of real grass roots campaigning with hand-outs and lawn signs, the results speak for themselves. A very well done to Karen and everyone who worked and voted!!!

It was a very odd month, weather wise; thank goodness April 1st is nearly at hand. There's been a combination of gorgeous clear, stable nights, and rain; fairly mild temperatures, and bitter cold. One weekend, it was forecasted to rain, and indeed, the first hour after sunset, the clear blue sky clouded over, and gave us but a few tantalizing peeks at the brightest object (Jupiter) and the occasional star. But then it broke up, and cleared out *completely*. I mean, there wasn't a cloud in the sky, anywhere – not even on the horizon, in any direction! At one point, before it cleared up, we had to close up against the moisture, and it actually snowed *inside* the dome. The trapped moisture condensed as the increased localized air pressure forced the dewpoint to fall, and it was so cold, the fine mist turned to ice particles and dusted everything about 1/8th inch. It was *beautiful*, but



Up, up, and away!

bad for the optics. Fortunately, we've got one of those hand-held dashboard dust mops, and we were able to pick up most of the ice-dust from the more sensitive surfaces, such as Rachel's primary element, and the eye-pieces. We generally don't recommend you use those hand mops for cleaning optics, but it was just so, well, *handy*. After we cleaned up, with nothing better to do, Conrad decided to use the time to train **Debbie Dyke** and



On April 4–5, comet Ikeya-Zhang will pass right by Andromeda Galaxy! But, it will be a difficult view, being so close to the horizon and right after sunset, as shown in this depiction from Starry Night Pro.

myself on Rachel's operations. It *seems* easy enough, but you really have to pay *total* attention or it can get away from you <yipes!> For example: Newton's Laws (such as, "an object in motion tends to stay in motion"). Debbie kind of learned that one the hard way. We are always on the lookout for more people to learn to run the big 'scopes, so if you have an interest, let Conrad know.

Sadly, it's about time to say *au revoir* to our friends, Jupiter and Saturn. They really make hanging out in the freezing cold worthwhile, if not quite enjoyable. Another object of interest, this last month, has been comet Ikeya-Zhang. Unfortunately, it will just continue to get closer and closer to the horizon and will lose its tail, faint as it is, by the first week of April 2002. It was neat to see in March, but that was about it.

Astronomy Day is here, and there will be events happening at Chabot and Jack London Square which we will be working to help promote astronomy to the public. If you'd like to volunteer some time with public viewing or whatever, contact President Carter Roberts (contact info on back page). ★

► **KRON TV at Chabot**

PS: It didn't really snow in the dome; we didn't use a dust mop on any optical surfaces; and Debbie isn't really hanging from Rachel, though she was the one who doctored the picture. April Fool!!!



Observed Through a Three-Inch Telescope

By Jim Scala

When it comes to deep-sky observing, there is no substitute for aperture, and the three-inch telescope usually leaves the observer asking for more. Sure, there are exceptions that include the Orion nebula, which shows nice hints of dust lanes, and in northern skies, M 13 is more than a smudge of light even if it's not quite resolved. However, with the CCD camera, the three-inch telescope becomes a giant and limits soon disappear. Short notes about cost and CCDs are important.

What CCD cameras accomplish.

The CCD chip is much more sensitive than readily available sensitive films. For example, a chip accessible to amateurs will record 18th magnitude in one minute. Although that sounds easy, to see the star requires some work with dark fields, flats fields and other processing adjustments. However, they are done at your computer with no mixing of chemicals and if something doesn't work, you can return to your original and try again. Any one of many books can get you started.

But is it too costly?

I always hear the old saw, "but you have a big telescope and an expensive camera." The answer is, yes, I do, but I started small and have a relatively inexpensive CCD camera as well. The ST5C CCD camera costs under \$800 (my used one went for \$500) and a good three-inch telescope is much less expensive than the standard eight-inch SCTs that seem to abound. So, for the price of an eight-inch telescope, a person can be taking images through a three-inch telescope that will rival what you can see through a twenty-inch telescope. Nonetheless, the test is in the tasting.

Double Cluster In Perseus NGC 869

The double cluster in Perseus (NGC 869) is simply spectacular in any telescope. The three inch brings out all its glory because its wide field allows the viewer to see the entire field; the image is also spectacular since it brings out and exaggerates to a modest extent the star colors. In addition, the number of stars visible is incredible.



This image is also spectacular since it brings out and exaggerates to a modest extent the star colors. In addition, the number of stars visible is incredible.

This image was made by stacking five three-minute images and then combining with two each of red and green and four blue images exposed for three minutes. The extra blue images are required to equal the light through the red and green filters since the blue filter blocks more light than the other colors.

M 33 Spiral Galaxy In Triangulum

M 33, the spiral galaxy in Triangulum, can barely be seen with my three inch in the light polluted Bay Area skies. In-

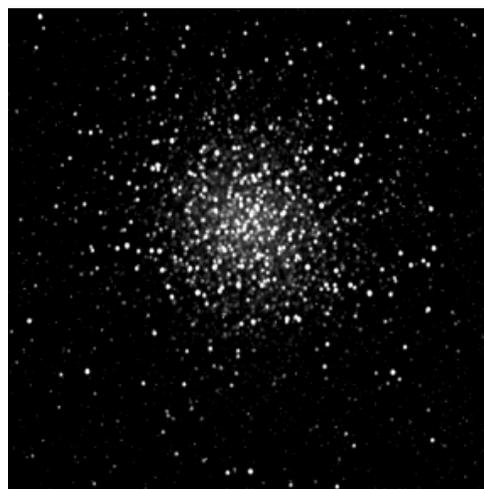
deed, it's a challenge in my fine five-inch refractor and is simply a smudge of light in my nine-inch refractor. However, this stack of ten three-minute exposures through the three inch is by any measure glorious. The colors are quite true and M 33's structure requires no imagination.



This image was made by stacking ten three-minute luminescence images (CCD parlance for a clear filter), two each of three minute red and green and four blue. In CCD terminology, it is called a thirty minute image.

M 13, Globular Cluster In Hercules: "The King of Summer"

Who hasn't looked at M 13 with any telescope; indeed, my



three inch will not resolve it, but shows it as a definite round bright object. However, this three minute image brings out M 13's stars right to the core.

This image was made by stacking three one-minute luminescence, one each of red and green and two blue. In CCD parlance, it is a three

minute image.

What's the teaching here?

In science when a new tool is applied to an old problem, discoveries are made. CCD astronomy has revolutionized our knowledge of the universe. However, here we are adding a new dimension to an old and glorious hobby. In addition, these images and the others in this series illustrated very nicely how the CCD camera adds a new dimension to amateur astronomy with a small telescope. I purposely kept the above images at three minutes. My reasoning was that any reasonably good mount can easily be guided for three minutes; some will do just fine unguided for three minutes because they have a built in periodic error corrector which is set by simply guiding for about a minute.

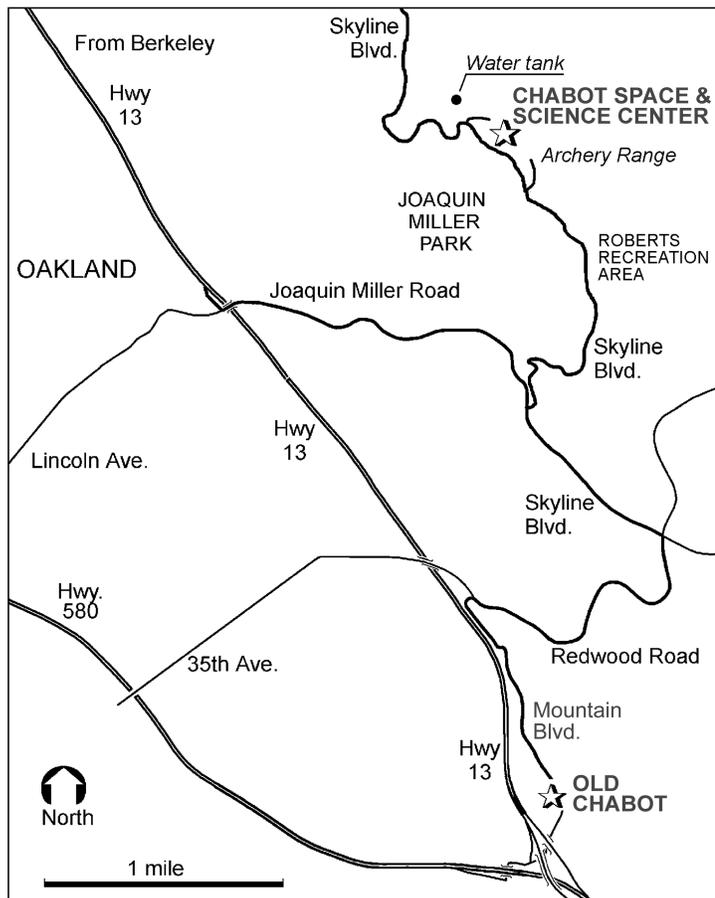
I sincerely hope this series will encourage some to dust off that unused three-inch telescope, purchase a CCD and get going. I hope that if you are thinking of purchasing a new telescope that you'll give some thought to a small, light refractor, good mount and a CCD camera instead of the massive SCT. ★



Eastbay Astronomical Society

At Chabot Space & Science Center
10000 Skyline Boulevard • Oakland, CA 94619

April 2002
RETURN SERVICE REQUESTED



FUTURE CONJUNCTIONS

March 31 – April 5 Spring Break Days/Nights at Chabot (until 9pm)

April 2002

- 6 6:30pm EAS Annual Awards Dinner, Plan Landscapes, Chabot
- 11 7:30pm EAS Board Meeting, Chabot
- 13 2-5pm Library Work Party, Chabot
- 20 Astronomy Day

May 2002

- 4 7:30pm EAS General Meeting, Chabot
- 9 7:30pm EAS Board Meeting, Chabot

Eastbay Astronomical Society

President:	Carter Roberts	(510) 524-2146 cwr Roberts@earthlink.net
Vice President:	Phil Crabbe II	(510) 655-4772
Treasurer, Membership:	Don Stone	(707) 938-1667 ddcstone@earthlink.net

Articles and photos for *The Refractor* are encouraged. Deadline for the May issue is April 15, 2002. Items may be submitted by mail to the editor, Don Saito, 3514 Randolph Avenue, Oakland, CA 94602-1228. Internet email address: donsaito@pacbell.net. Day: (510) 587-6052 Eve: (510) 482-2913.

Join the Eastbay Astronomical Society

- Regular, \$24/year
 - Family, \$36/year
 - Contributing, \$40/year
 - Sustaining, \$60/year or more
- Contact: Don Stone, EAS Membership Registrar
Telephone: (707) 938-1667 Email: ddcstone@earthlink.net
Mail: 19047 Robinson Road, Sonoma, CA 95476-5517