

# The Refractor

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

Volume 78  
 Number 11  
 June 2002

## Guest Speaker:

## Peter Abrahams

“The Early History of Binocular Telescopes, 1600-1900”

Saturday, June 1, 2002

Physics Lab, 2nd Floor, Spees Bldg  
 Chabot Space & Science Center, Oakland

- Presentation – 7:30 pm
- Club Business afterwards

Telescopes have been designed and constructed in a binocular configuration since the era in which their documentation begins. Hans Lippershey's first four telescopes included three binocular instruments. The first centuries of the telescope saw many binocular instruments made from refractors and various

types of reflectors. The contemporary record of these binocular telescopes and their use, and the surviving examples in today's museums, will be discussed and illustrated. 1894 saw the introduction of the modern prism binocular, marking the close of an era of beautiful but less than efficient instruments. There is no English language book on the history of the binocular, and this shortage motivated the paper to be heard at EAS on 01 June.

Peter Abrahams is a writer on the history of optical instruments,

with articles in "Amateur Telescope Making Journal", the Smithsonian's "Rittenhouse: Journal of the American Scientific Instrument Enterprise", and the "Journal of the Antique Telescope Society". The experience of publishing on the internet has been very productive & rewarding, and recent work has been posted to his web site at <http://home.europa.com/~telscope/binotele.htm> ★

## Planetary alignment brings throngs to Chabot Observatory

For the last several weeks, a rare planetary alignment has been happening, bringing all five of the planets visible to the naked eye into the same part of the sky at the same time, and bringing large crowds to public view

nights on Fri/Sat nights up at Chabot. On May 6th, this view was had from the roof of the Dellums Building overlooking Wightman Plaza, with Jupiter in the upper-left, then just over the red tower light; Venus, Saturn, Mars (in order of brightness), and finally, Mercury to the bottom-right, barely visible above the Bay Area's glow. ★

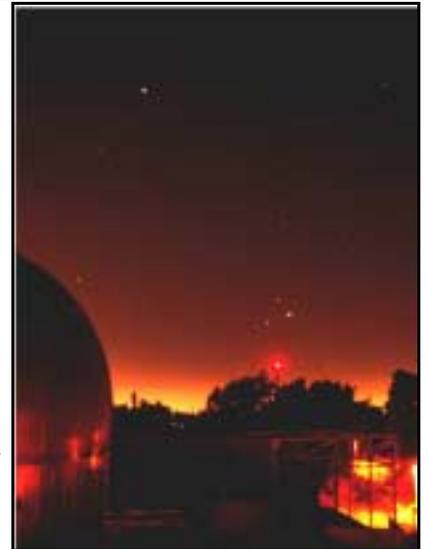


Photo by Don Saito



Binocular Gregorian Telescope, circa 1765  
 (Image by James Short)

### DINNER WITH THE SPEAKER

5:30 pm

Saturday, June 1, 2002

HUNAN YUAN

4100 Redwood Rd., #11  
 (next to Safeway)

Oakland

(510) 531-1415

Please call Betty Neall at 510/533-2394 by Friday, May 31st to confirm your place.

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## The Iroquois Confederacy

By Ellis Myers

The most powerful group of Native Americans in the days before the Revolutionary War consisted of the six nations: Cayuga, Mohawk, Oneida, Onondaga, Seneca and Tuscarora. They lived chiefly in the area of New York State. According to a 1600s chronicle by Nicolaes van Wassenaer, "The women are the most experienced star-gazers; there is scarcely one of them but can name all the stars; their rising and setting. The position of the Great Bear is as well known to them as to us and they name other constellations by other names."

One Iroquois legend tells of the great snow bear, Nya-gwa-ih, and how he eluded the hunters who followed him. The bear was a menace to the village, killing and devouring the deer that the people needed for food in the winter. One night three brothers each had a dream that he had found the bear. Next morning, on the telling of their dreams, they realized the significance of their coincidence, and they set off secretly with their faithful dog, Ji-yeh, in order that they would win the acclaim and approbation of the entire village.

After a hard trek through the snow covered forests and hillsides they caught sight of the bear. It was pushed into a snow bank and was ravenously tearing at its meal of a deer. Knowing that they would capture the beast, the braves first prepared a fire for cooking it. But when they had felled a small tree and gathered brush for the fire, they were dismayed to find that the bear had vanished and the snow had covered its tracks.

They discerned the shadow of the bear on the distant hills, however, and they began a determined chase. They did not stop to rest, and at night they did not stop to sleep. They were convinced by their dream that victory was theirs. They kept on and on until they reached the edge of the world, and still they kept on, into the sky.

Nya-gwa-ih forged ahead, pushing aside the clouds and climbing higher, but tiring now, until at last the bear wove an invisible net and crawled under it to rest. The untiring hunters came upon the sleeping bear and knew that they would not lose him now. But the bear awoke, lifted the net in his great paws, dragged the hunters and their dog under it and flung everything into the sky. The hunters are Alcaid, Mizar, and Alioth; the dog Ji-yeh is Alcor, and the four stars of the bowl of the Dipper are the great bear, forever eluding the hunters. The net is there, too; we call it Corona Borealis.

The constellation Ursa Major is known to most of us simply as its asterism, the Big Dipper. Similarly, this group of seven stars has been recognized in different cultures in many different ways, and it has had many different names. These include the English Plough, the European Wagon, the Chinese Government, and the ancient Hebrew Coffin. But the Dipper is only a portion of the large constellation, and represents only the tail and hind quarters of the Great Bear.

Each of the stars of the Big Dipper has a name. Beginning with the pointer star nearest the pole and moving around the bowl and along the handle, there is Dubhe (Alpha), Merak (Beta), Phecda (Gamma), Megrez (Delta), Alioth (Epsilon), Mizar (Zeta), and Alcaid (Eta). Except for the first and last of these, they form an open star cluster, moving together with a common motion through space in a direction toward Sagittarius. This cluster is the nearest such to our Solar System, about 75 light years distant. The Sun has a similar motion toward Sagittarius, and an observer in a different part of the Universe may consider us a part of the cluster, although it is not certain that there is any physical association.

The entire constellation of Ursa Major, of course, includes much else than the Big Dipper. Seven Messier objects are located in this part of the sky, including five spiral galaxies. M81 and M82 can be found in binoculars. They are about a half degree apart. From Dubhe, look about 7½ degrees north and one hour west. M81 is similar to the Andromeda galaxy and to our own Milky Way, with a bright center and delicate spiral arms. It is about 36,000 light years in diameter and is about 7 million light years distant. Other spirals are M101, M108, M109; M97 is the interesting Owl Nebula, while M40 is a pair of faint stars that Charles Messier noted as "two stars very close."

W Ursa Majoris is an eclipsing binary about 200 light years away. The larger of the pair is comparable to our Sun, while the smaller has 83% of the Sun's diameter. These stars are so close together that their surfaces almost touch. As the binary orbital plane lies along our line of sight, the two stars take turns in eclipsing the other. So, the magnitude dips and rises from 8.3 to 9.1 twice in the short orbital period of eight hours. ★

► *Bode's Galaxy,  
M81 in Ursa Major*



## From the President

### *Dave & Carter go to the Zoo*

Since the Solar viewing at the Oakland Zoo was so successful on Astronomy Day, we have decided to do it again. Dave Rodrigues and I will be there again on Saturday, June 15 from 10 am to 4 pm (the hours they are open). We will be setting up just inside the main entrance next to the flamingos. We expect to show the Sun with a hydrogen alpha filter on the C-8 and in white light with the Sunspotter. The 5-day old Moon will be visible for most of the day and we will probably use Dave's 8-inch to show it. It would be ideal to have some additional help, especially in mid-afternoon since operating we were very busy last time trying to operate three instruments and hand out literature. If you can help, please contact Dave at (510) 483-9191 [davevrod@aol.com](mailto:davevrod@aol.com), or Carter at (510) 410-4697 [cwroberts@earthlink.net](mailto:cwroberts@earthlink.net).

### *EAS Star Party at CSSC*

There will be another star party for EAS members and friends on the evening of **Sunday, June 16th**. This is Father's Day but sunset isn't until 8:33 so there is plenty of time to honor your father and then join us on Wightman Plaza. Bring your own 'scope if you wish, or look through Rachel and Leah. This would be a good opportunity to bring along a friend you think might be a potential new member. If you have any questions contact Don Saito at [donsaito@pacbell.net](mailto:donsaito@pacbell.net) or (510) 482-2913.

### *Annual Low Oxygen Star Party*

The annual trek to the Barcroft Research Lab in the White Mountains of eastern California will take place beginning on Thursday August 8th when we assemble at the Grandview campground at 8600 feet. While it is not mandatory, the overnight stay at this altitude helps one acclimatize to the reduced oxygen level for this high-altitude observing session. On Friday August 9th we migrate up past the bristlecone pines to Barcroft at an elevation of about 12,435 feet. This is the weekend for the Perseid meteor shower and one of the peaks is predicted for Monday night. Because of this, we have arranged for people to stay for up to 5 nights (until Wednesday the 14th) if desired. This is always a very popular trip with both EAS and TVS members, and you should get a check in soon to reserve your spot. The UC system has raised rates this year so the cost will be \$50 per person per night for EAS and/or TVS members and \$55 for others. Send your reservation to Dave Rodrigues, 1633 Graff Ct, San Leandro 94577. For information contact Dave at (510) 483-9191 or [davevrod@aol.com](mailto:davevrod@aol.com).

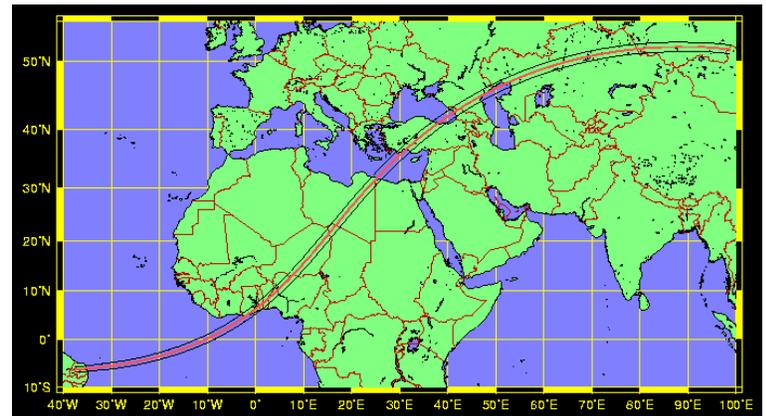
### *Miscellaneous*

Beginning in July, our club meetings will be on the **THIRD** Saturday of the month (July 20th). This puts the meeting closer to full Moon. Also, due to scheduling conflicts, there will be no Bort Meadows star party this year. We'll try to organize an alternate activity. ★

## Eclipse trips of the rich and famous

*This sounds like a very nicely packaged astro-trip, but the price tag on it is rather steep at over \$5K. Still, if you've just got to see an eclipse, this one will get you there and back in style!*

My company specializes in tours with an archaeological and cultural emphasis. We also design itineraries to the specific interest of already intact groups. I would first of all like to tell you about an upcoming trip - Peru and Bolivia: The Ancient Astronomy of the Andes - that is led by astronomer, Dr. E.C. Krupp, director of the Griffith Observatory in Los Angeles. You may see the itinerary by going to - [http://www.farhorizon.com/south-america/peru\\_and\\_bolivia.htm](http://www.farhorizon.com/south-america/peru_and_bolivia.htm). Additionally, we are looking at possibilities of tours that will highlight the solar eclipse which crosses Africa, Turkey, Kazakhstan, and Russia on March 29, 2006. It will also nick the northwestern corner of Egypt. The path of the eclipse is below. Would your members



be interested in a tour that is specifically designed for the society membership? We at Far Horizons would be very happy to work with you in putting together a unique itinerary.

Please don't hesitate to contact me with any questions you may have.

Regards,  
Mary Dell Lucas  
Director

Far Horizons Archaeological and Cultural Trips, Inc.

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web page: [www.farhorizon.com](http://www.farhorizon.com) ★

## Editor's News 'n Views

You might be thinking: "Didn't I just get my Refractor a few weeks ago?" It's not just your imagination. This business of getting the newsletter just a few days before the monthly meeting is no-goodnick, for lack of a better term, and it's high time we changed it. So, from now on, I'm going to try publishing the newsletter earlier - about one to two weeks after each monthly meeting, to be exact. This will also enable me to use a cheaper printer service, and save \$\$\$. Our Treasurer, the venerable Don Stone, tells me the club's finances are under a strain, and since the newsletter is the biggest monthly expense, it behooves me to try and get the cost of it down. Which brings me to the next (related) subject: Digital newsletter delivery. Not all of you who have email and web access are getting the newsletter via that medium. If you did, it would help our financial situation significantly (not to mention the other benefits of digital delivery, which include: color pictures, easy storage, better for the environment (less paper), and earlier delivery. Of course, to be honest, the downside of digital delivery is: you can't read it in the bathroom unless you print it out (or you have a computer in your bathroom), if you've got anything less than a DSL or cable connection, it can take a long time to download (as much as 3 or 4 minutes for a standard newsletter, using a 56K modem), and the color pictures aren't as crisp as the printed B&W images. If you think you can put up with the downsides, and would like to help the club out financially, ask Treasurer Don to have him switch you from analog to digital delivery.

**In the news this month:** How about that planetary alignment on May 6th, eh? That's when the three-planet convergence got into its tightest configuration; Venus, Saturn, and Mars. Coincidentally, that also happened April 1st, 2 BC, and is one of the phenomenon that *could* have been interpreted as "The Star of Bethlehem," that guided the three Wise Men to find the baby Jesus, if you believe that sort of thing. For the weeks before May 6th, the five planets that are possible to see with the naked eye were all lined up: Jupiter, Saturn, Mars, Venus, and Mercury, all following the Sun like ducklings after their mother. A rare and beautiful sight!

We've got another Members Only view night coming up on on Sunday, June 16th. I forgot to really advertise the last one we had on Monday, May 13<sup>th</sup>, except for a tiny line in the *Future Conjunctions* box on the back page (sorry about that). About 15 people showed up, nonetheless, and it was a beautiful night for viewing, with both Rachel and Leah swinging into action to acquire views of Jupiter, Mars, Venus, M13, M3, M51 (Whirlpool), M81 (Bodes), M82 (Cigar), Comet Ikeya-Zhang, and a fantastic naked-eye view of the planetary alignment: Jupiter, Mars, Saturn, Venus, (Mercury has finally gotten too close to the Sun to be seen) and the thinnest crescent Moon I've ever seen, hugging the rest of its dark, but dimly earthlit, globe. **Paul Hoy** brought his digitized video of the roof placement for the 36" telescope building, and **Carter Roberts** brought his bino-viewers for some really nice 3D

views. We had both telescopes at our beck and call, and it was great!

And finally, this just in: the roof for the soon-to-be-installed 36" reflecting telescope, *Nellie*, was hoisted by crane and installed onto its building Monday, May 13th. KRON Channel 4 television was there to capture the event, and interviewed Kevin Medlock! ☆

▶ *Classic pose: A crescent Moon and the planet Venus in conjunction on May 14th.*

▼ *Father and son test the curvature of their mirror.*



▶ *The picture for this billboard was taken by Carter Roberts using his Nikon Coolpix 990 digital camera!*



◀ *Kevin Medlock gives a television news interview for the 36" observatory roof lifting (which can be viewed at the KRON website in their News/Video section)*

# EAS Focus Groups

By Terry Galloway, PhD.

Starting right now, we are seeking interested astro-buffs to sign up for these various groups. As soon as we have a critical mass of at least 4 people, the group shall be launched. In most cases we are also seeking Group Leaders to manage the group and to utilize existing or arrange for the appropriate equipment needed from our extensive inventory of such equipment and from our professional contacts at nearby observatories, universities, and national laboratories.

If there are any additional groups, that have not been recognized in the above list, don't hesitate to email me and let me know and we will see if these new groups will attract a critical mass of new members.

All group members must be CSSC Volunteers as well as EAS Members in good standing to participate in these groups. Members must be at least 13 years old or in 7th grade to qualify.

**ASTRO-IMAGING GROUP:** This group, headed by Conrad Jung, will introduce the new astro-buff to taking CCD images through Leah and Rachel using common CCD cameras like Nikon CoolPix 990 and 995.\*

**ADVANCED ASTRO-IMAGING GROUP:** This group will consist of graduates from the above group that will be qualified to use our new 36" cassegrain reflector telescope with its new Apogee 16E, 16 megapixel CCD camera. We hope to get some truly breathtaking deep-sky and hi-res images that can be displayed at Chabot for the public enjoyment and student education.\*

**VARIABLE STARS GROUP:** Involves using old photographic plates from Chabot back to 1885 together with more modern star atlases as well as CCD images taken with our telescopes to look for variable stars, super-nova, pulsars, etc. Maybe new discoveries can be made. This group is part of the internationally recognized group American Association of Variable Star Observers, AAVSO.

**OCCULTATION TIMING:** This group headed by Mark Gingrich is part of a large group of occultation astronomers around the world documenting the alignment of planets, moons, asteroids, etc and producing accurate positional information, some surface information and many other surprising events.

**ATMOSPHERIC EXTINCTION PHOTOMETRY:** This group, headed by Terry Galloway, continues the early work done at old Chabot where spectral absorption in the local tropospheric atmosphere as well as the total atmosphere path to derive key information about air pollution, natural haze, and other fascinating chemical phenomena. This work is being done in cooperation with the Atmospheric Sciences Dept. of the Los Alamos National Lab.

**PLANETARY OBSERVATIONS:** Visual observations

and key CCD Imaging will be used to "discover" new planetary phenomena rarely seen, not previously known, or just plain astonishing. This group is part of the American Lunar and Planetary Observers, ALPO.\*

**SOLAR OBSERVATION:** This group will have the responsibility of establish new research and public programs utilizing our new Chabot Vacuum Solar Telescope, CVST, producing high magnification images of the suns fascinating surface in white light, Hydrogen-alpha, and Calcium K-line. This group will be in association with the La Palma Solar Observatory in Spain.\*

**SEISMOLOGY STUDIES:** The professional seismographic detectors, graphics displays, etc. from old Chabot combined with newly available equipment will be used to monitor earthquake activities within the Hayward and other regional fault zones.

**BROWN DWARF CLOUD DETECTION:** This group is being formed by Prof. Gibor Basri, discoverer of the Brown Dwarf, to use Chabot large telescopes to detect and monitor changes in the brightness of Brown Dwarfs.

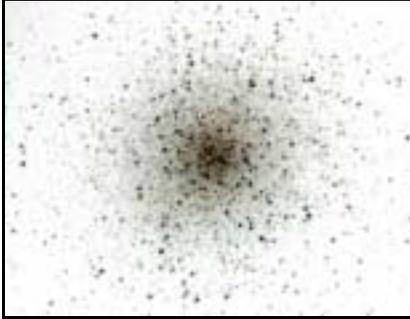
**M-CLASS FLARES:** These are stellar eruptions that are occurring on Brown Dwarfs and related stars that can be observed with Chabot's large telescopes.

**RYAN'S ASTRO GROUP:** Our Director of Astronomy, Ryan Diduck has formed a special group that will develop a series of fascinating projects using the new 36" Cassegrain Reflector and the powerful Apogee 16E, 16 megapixel CCD camera. This is the same size CCD used on the newly refurbished Hubble Telescope and will produce some world-class images with our new telescope.

**RADIO ASTRONOMY:** Although our urban site does not permit conventional radio astronomy, there are special phenomena that can be monitored and displayed and heard for public audiences, such as Jupiter Noise Storms and many other interesting Atmospheric-phenomena. This group is associated with Prof. Harold Weaver, well know Radio-astronomer and founder of U.C. Hat Creek Radio-astronomical Observatory.

**EXTRA SOLAR PLANETS:** This is a special group that has been formed and headed by astrophysicist, Dr. Steve Matthews, at the urging of Prof. Geoff Marcy's group and his project leader Debra Fisher and project engineer, Matt Radovan. This involves the photometric monitoring of stars suspected or known to have orbiting planets partially occulting the surface brightness of the star. Advanced and very sensitive photon-counting equipment together with one of the most sensitive photomultiplier tubes, RCA 31034, will be used to produce the periodic photometric changes associated with orbiting extra-solar planets. ☆

*\*We may be able to arrange with Chabot the sale of images produced from these groups in the Starry Nights gift shop to help support them, financially.*

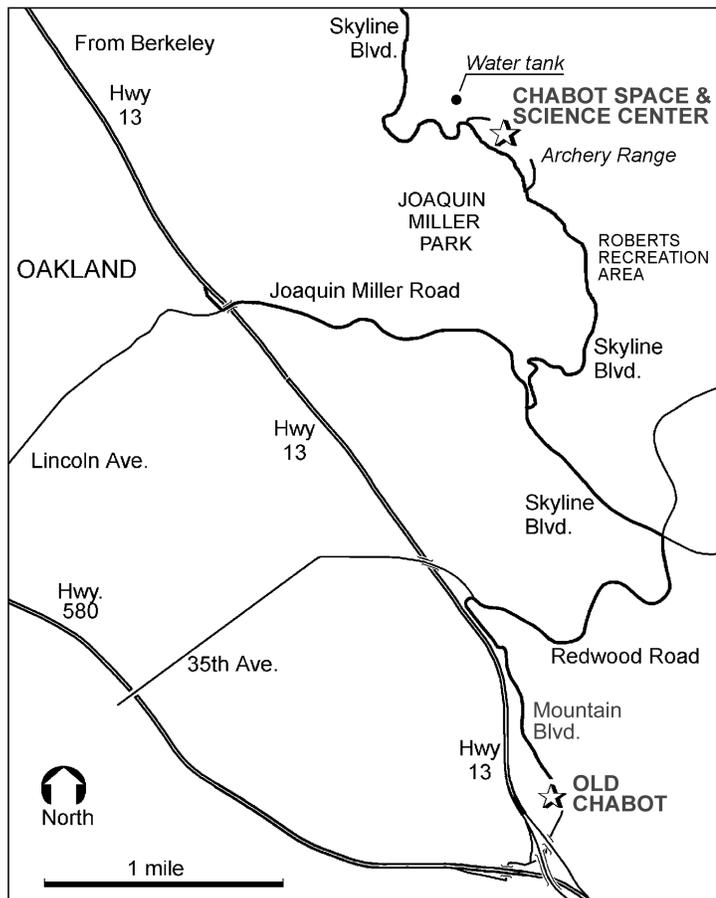




# Eastbay Astronomical Society

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

June 2002  
*RETURN SERVICE REQUESTED*



## FUTURE CONJUNCTIONS

June 2002

- 1 7:30 pm EAS General Meeting, Chabot
- 13 7:30 pm EAS Board Meeting, Chabot
- 16 Members Only Observing Night at Chabot

July 2002

- 10-14 Shingletown star party
- 11 7:30 pm EAS Board Meeting, Chabot
- 20 7:30 pm EAS General Meeting, Chabot

## Eastbay Astronomical Society

President:	Carter Roberts	(510) 524-2146 cwroberts@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 July-August issue is June 8, 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
- Student, \$10/year (digital newsletter delivery only)
- 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