

The Refractor

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

Volume 81
 Number 10
 August 2005

August 2005 talk: *Members' Night*

Saturday, August 20, 2005, 7:30 pm
 Speaker: Carter Roberts, et al (and others)

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

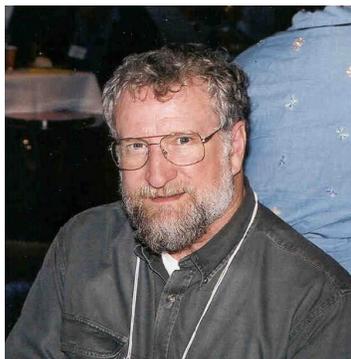
It's that time of the year when summer vacations have ended, the pictures have returned from the drug store, and the stories have been digested, summarized, and put into chronological order. In other words, it's time for this year's Members' Night! Bring your slides, videos, and regale us with tales of your adventures abroad.



For starters, our President, Carter Roberts, will give a slide presentation and talk about his trip earlier this year to the Galapagos Islands, where he witnessed the total solar eclipse in that corner of the world, and the many strange and beautiful animals of the Galapagos. Also, Bruce Skelly will demonstrate some of the software that is

available from the *Centre de Donnees Astronomiques de Strasbourg* (CDS), including *Simbad*, a search engine that can search 3,514,550 objects, 9,364,391 identifiers, 158,709 bibliographic references, and 4,794,126 citations of objects in papers. He will also demonstrate *Vizier*, which is a tool for retrieving portions of catalogs, and *Aladin*, which is a visualization tool for looking at data and images. The application CDs have over 6000 catalogs, of which over 5100 are available online, and over 4800 are available via *VizER*.

It's going to be a real cornucopia of interesting stuff from YOU, the members; it'll be a lot of fun, so BE THERE! ★



Third contact "diamond ring" effect, total solar eclipse, April 8, 2005, Galapagos Islands—photo by Carter Roberts

It's Renewal Time

Be sure to renew your Eastbay Astronomical Society membership before November 1st, 2005 to get uninterrupted newsletters and all the other benefits that membership conveys

DINNER WITH THE SPEAKER

5:30 pm
 Saturday, August 20
HUNAN YUAN
 4100 Redwood Rd., #11
 (next to Safeway)
 Oakland
 (510) 531-1415
 No need to confirm—just show up!

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Astro Jeopardy?

by Ellis Myers

Question:

This telescope atop Mt. Fowlkes is unique in that it is of alt-azimuth design, but fixed at 55° elevation. Its segmented mirror has an effective aperture of 9.2 meters.

Answer:

The Hobby-Eberly Telescope at McDonald Observatory, University of Texas

The Hobby-Eberly Telescope, or HET, is one of the world's largest optical telescopes, and is a joint project of The University of Texas, Penn State, Stanford University, and two German universities. Its location is atop Mount Fowlkes in the Davis Mountains of West Texas, a mile from the other McDonald Observatory telescopes on Mount Locke.

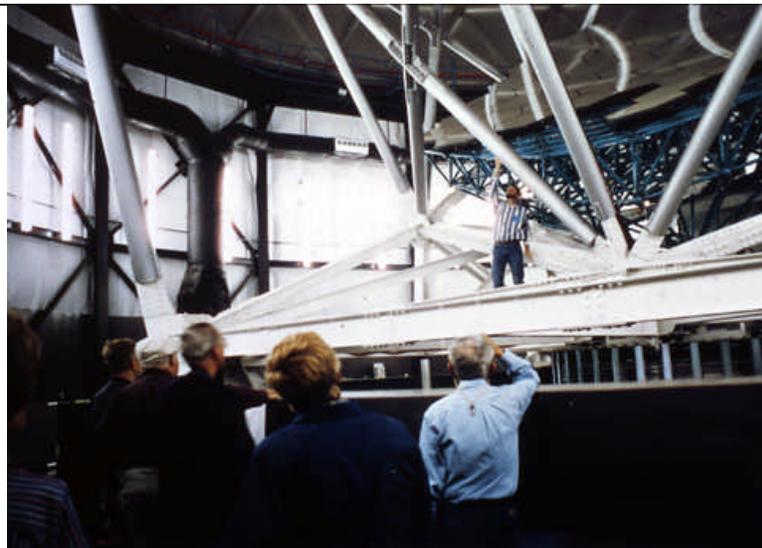
Designed specifically for spectroscopy, the HET's substantial light-gathering capability makes it ideal for studying distant galaxies, exploding stars, black holes, and for finding planets around other stars. Astronomers are currently obtaining measures of stellar radial velocities as accurate as 2–3 meters per second. They recently announced discovery of a fourth planet in orbit around the star Rho 1 Cancri. The smallest extra-solar planet yet identified, it has a mass about 18 times that of Earth.

The Hobby-Eberly telescope consists of 91 hexagonal mirrors, each one meter across the flats, aligned exactly to form a spherical—not parabolic—reflecting surface. The shape of each mirror segment is fine-tuned by a laser-alignment system. The mirror segments form a reflecting surface that is 11 by 10 meters. However, the HET is known as a 9.2-meter telescope because that's how much of the mirror is actually in use at any given time. This makes the HET, scientifically speaking, the third largest telescope in the world.

Unlike most other telescopes, which tilt up and down in altitude, the HET's mirror is always tilted at 55 degrees above the horizon. The massive telescope rotates in azimuth on air bearings, like a hovercraft. A "tracker" mounted above the telescope moves in six directions and allows the HET to study 70 percent of the sky. Tracking of astronomical targets is achieved through moving the tracker optical package rather than the whole telescope. The tracker contains spherical aberration correction optics and instrument feeds. The light collected at the tracker is conveyed through fiber optics to one of three spectrographic instruments.

One interesting study involving the HET's special spectrographic efficacy is its search for a relationship between the Sun's 11-year magnetic cycle and the dynamics of solar granules. By aiming the telescope toward the sunset sky—but not directly at the Sun—McDonald Observatory astronomers can tell how bright the granules at the Sun's surface are, and how fast they're rising toward the surface.

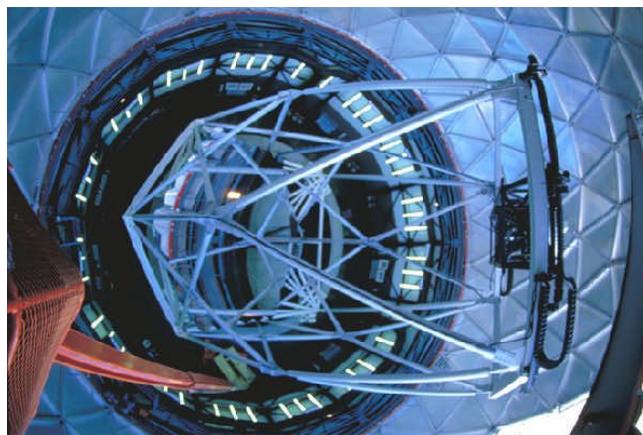
This telescope was built exclusively for spectrography, and a twin is being constructed in South Africa; together, they are opening exciting new vistas for astronomical research. ★



Astronomer Mark Shetrone points out the primary mirror within the dome of the Hobby-Eberly telescope. Notice the curved reflections of the struts on the mirror, which is missing a couple of hexagonal segments. This photo was taken in 1998, while the telescope was in shakedown mode. This first group given a tour of the facility included EAS members Marshal Merriam and Ellis Myers.



The mushroom outcrop on the dome houses the laser-alignment equipment that controls the precise shape of the 91 mirror segments which comprise the primary of the Hobby-Eberly telescope at the McDonald Observatory.



A wide-angle view from directly above

EASTBAY ASTRONOMICAL SOCIETY MEMBERSHIP APPLICATION FORM

New Membership Renewal of Existing Membership

NAME: _____
(please print)

ADDRESS: _____

CITY, STATE, ZIP _____

DAY PHONE: (____) _____

EVE PHONE: (____) _____

EMAIL ADDRESS: _____
(please print very legibly!)

MEMBERSHIP CATEGORIES:

- Regular \$24 Family \$36 Contributing \$40
 Sustaining \$60 or more \$ _____ Student \$10 (digital newsletter only)

Optional discounted 12-month magazine subscriptions:

- Sky & Telescope \$32.95 Astronomy \$34.00 (both magazines may only be ordered between the months of July and December)

Optional, tax deductible donation(s) to any of the projects of the Eastbay Astronomical Society:
Burns Library \$ _____ Betty Neall Youth Award Fund \$ _____ General
\$ _____ Other: _____

EAS Lapel Pin \$3.00 +\$1.00 per pin for shipping and handling. # of pins _____ Total Amount for # of pins
\$ _____

(Tip: If you buy them at a club meeting or event, you can avoid the S&H fee.)

Total Enclosed: \$ _____

Please mail this form and your check or money order payable to:

Eastbay Astronomical Society
19047 Robinson Road
Sonoma, CA 95476-5517

For more information, please contact Membership Chairman Don Stone at (707) 938-1667, ddcstone@earthlink.net, or write him at the address, above.

By default, (if you have an email address) you will be notified by email that the digital (.pdf) version of the club newsletter is ready to download off the club website. If you prefer to get the B&W hard copy, please check the box below:

I prefer the hard copy mailed to the address entered above.

And,

Are you interested in volunteering your time/equipment for public stargazing at Chabot?

Are you interested in doing other volunteer work for Chabot and/or the Eastbay Astronomical Society?

THANK YOU FOR JOINING US!

Membership has its privileges...

- **Monthly newsletter, *The Refractor***, with interesting articles on currently visible constellations, upcoming lectures, club events, stories, equipment reviews, local news, and more.
- **Monthly meetings** with featured guest speakers on all subjects from Astronauts to Zooming telescope eyepieces; from finding deep-sky objects, to planetary geology. Every and any thing having to do with astronomy, telescopes, and the space sciences. All that, and cookies and sodas, too!
- **Help and advice to new telescope owners.** Got a new telescope and don't know what to do with it? Bring it to a meeting; we'll be able to help you figure it out! If you're interested in getting a telescope, we can give you some good advice; be warned: there are a *lot* of bad telescopes out there!
- **Members-Only view nights at Chabot's large telescopes** to avoid the weekend crowds. We view galaxies, nebulae, star clusters, planets, the Moon, comets, double-stars, and whatever else is up!
- **Weekly star parties at Chabot.** Interested EAS members get trained to operate the big 'scopes (Leah, Rachel, and Nellie, the 8", 20", and 36" telescopes housed in three separate observatories) for Friday and Saturday night public viewing.
- **Yearly events:** Annual EAS Awards Dinner, star parties at nearby dark-sky sites, the Barcroft Station high-altitude star party in the White Mtns.
- **Telescope Makers' Workshop.** Friday evenings from 7–10 pm, hosted by Chabot, and operated by the EAS. For a small fee, plus the cost of the mirror and "tool," we will provide instruction and grinding/polishing supplies needed to make your own telescope mirror for less than half the cost of a store-bought one, that will likely be optically superior!
- **Advanced Astro-research Groups** using Chabot's large telescopes. Join a group to fit your particular astro-interest such as CCD or Film Astrophotography, Variable Stars, Solar, Seismological, Extra-Solar Planets, Occultations, Optical SETI, and more.

Access to Chabot's Science Library

Automatic membership in the

Astronomical League (a \$16 value)

***Astronomy and/or Sky & Telescope* subscription discounts (a \$10 value)**

+ Discounts on many items in the Sky and Telescope merchandise catalog



Join the Eastbay Astronomical Society, and begin expanding your knowledge of, and appreciation for, the night sky, our world, and the Universe!



Editor's News 'n Views

Howdy, Astro Fans! How's your summer coming along, so far? Have you gone to visit any cool astronomically-oriented places or events? If you did, write it up and send it in! Or, let me know, and I'll help you write it up. Digital or regular pictures would be

nice, too, but not essential.

Now, to the news! Part of the EAS' job is to provide Chabot's telescopes with maintenance and repair. Since the move from the old site, the 20" telescope's RA setting circle was "disabled" with the intention of getting it back into working order after the drive to get it refurbished and reinstalled at the new site. It took a while, but Rachel's RA setting circle is now functional, again! Everyone who uses Rachel is most appreciative. **Ken Swagerty**, EAS Director of Instruments, and **Terry Galloway**, adjusted the gearing alignment to eliminate the "variable inaccuracy" (wobble, or backlash) the telescope had developed. As part of this adjustment, they were also able to make other adjustments to restore the telescope's fine setting circle accuracy. Ken and **Carter Roberts** also reset the Dec circle pointer and it is almost exactly on now.

With these improvements and "tweaks," finding those faint fuzzies with Rachel's setting circles will be *much* easier.

A big thanks to **Ken Swagerty**, **Terry Galloway**, **Carter Roberts**, and **Kevin Medlock** (who re-polished the solid brass setting circle after some brain-dead worker used it, *face down*, as a door-stop!), and for the beautiful job of re-making the dial indicator.

Upcoming Events This Month:

Bort Meadows—Sat, Aug 13, 7pm—10pm (or later); we've just gotten back into doing this close-to-home annual star party. If you're interested in attending or helping out, just show up! It's very informal. Dress for all types of temperatures—you never know what you're going to get. The map to the right shows just how close it really is ▶▶▶

Chinatown StreetFest—Sat/Sun Aug 27 - 28, 10am 5pm; we work with CSSC by providing solar telescope viewing for the public. We'll have a couple of scopes there, already—what we really need are *bodies* to help with watching the scopes. It's fun, easy, and, when you're not manning the scopes, you get to wander around, see the sights; it's cool.

AANC Conference—Sat Aug 27, Hosted by SFAA, the SF Sidewalk Astronomers, and sponsored by the AANC, the Western Amateur Astronomers and the San Jose Amateur Astronomers. This year's theme is "Celebrating Bay Area Astronomy" and has an impressive lineup of speakers and activities. We will also be celebrating John Dobson's 90th birthday! Our speakers include Timothy Ferris, Lynette Cook, Steve Gottlieb and Richard Crisp; with additional presentations by Bob Schalk and Marni Berendsen, of the Astronomical Society of the Pacific. That evening, we'll have a star party at the Randall and deliver our 2005 AANC Awards.

For more information, visit the conference web site at http://www.planitarium.net/aanc/aanc-con2005/program_guide/

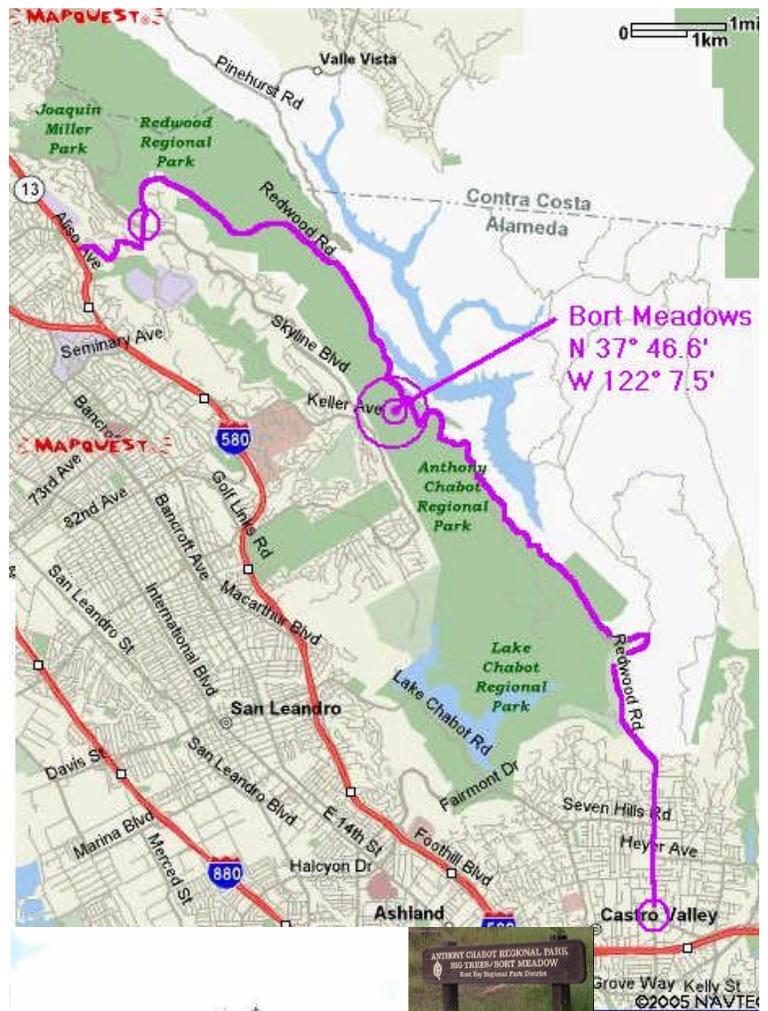
The \$25 registration fee includes admission to all speakers and workshop, as well as a boxed lunch. We appreciate pre-registration, as it helps us plan the number of meals needed. Register for the event either online via PayPal or send your \$25 check payable to: "AANC-CON 2005" c/o Don Stone, AANC Treasurer, 19047 Robinson Rd., Sonoma, CA 95476-5517

Paying at the door? If possible, please notify us in advance by emailing aancregistration@pacbell.net.

The AANC acts as a forum for communication to the Astronomy Community, funds public outreach events, gives seed money for educational programs, and holds conferences and rewards excellence in astronomy with annual awards.

VOLUNTEERS...we need 'em! Contact Stacy Jo McDermott at aanc2005volunteers@hotmail.com.

That's it for this month! Dark skies!!! ☆



◀ The entry to Bort Mdws as it looks when heading from the south to the north along Redwood Rd.



Eastbay Astronomical Society

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

August 2005
RETURN SERVICE REQUESTED

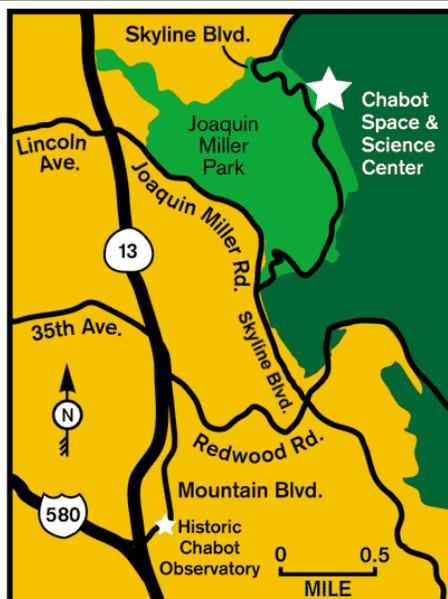
Eastbay Astronomical Society

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cwroberts@earthlink.net
ddcstone@earthlink.net

Vice President: Phil Crabbe II (510) 655-4772
Membership Reg: Bruce Skelly bjskelly@yahoo.com
Events Coord: Dave Rodrigues (510) 483-9191

Articles and photos for *The Refractor* are encouraged. Deadline for the August 2005 issue is August 31, 2005. Items may be submitted by mail to:
Editor - 3514 Randolph Avenue, Oakland, CA 94602-1228. Internet email address: donsaito@comcast.net Hm: (510) 482-2913.



FUTURE CONJUNCTIONS

- Aug 12 EAS Board Meeting, Chabot, Soda Board Room, 7:30pm
- 13 Bort Meadows star party
- 20 EAS General Meeting, Chabot, Physics Lab, 7:30pm
- 27 AANC Annual Convention,
- 27-28 Chinatown StreetFest public solar viewing
- Sep 8 EAS Board Meeting, Chabot, Soda Board Room, 7:30pm
- 17 EAS General Meeting, Chabot, Physics Lab, 7:30pm

Join the Eastbay Astronomical Society

- Regular, \$24/year Family, \$36/year
- Contributing, \$40/year Student, \$15/year (digital news-
- Sustaining, \$60/year or more letter, only)

Contact: Don Stone, EAS Membership Registrar
Telephone: (707) 938-1667 Email: ddcstone@earthlink.net
Mail: 19047 Robinson Road, Sonoma, CA 95476-5517

Sign up online at <http://www.eastbayastro.org/>