



The Refractor

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

Volume 79
 Number 11
 July 2003

This month's talk:

A Solar Observatory: Construction tips and stories

Saturday, July 12, 7:30 pm
 Chabot Space & Science Center
 Physics Lab, Spees Building

Speaker: Mike Rushford

The 10 yr. old (<http://www.eyes-on-the-skies.org>) Solar Observatory building is a role off roof construction. I will share with you the sequence of events that came together to inspire its shed like construction. Many solar events are recorded as movies to be shown with VCR on TV. This observatory provides realtime browser viewing of the sun as seen through an H-alpha filtered 3 inch telescope. Adjourn for discussion about your observatory ideas or the future UPS mobilized, cell phone controlled observatory.

This year the theme at Riverside Telescope Makers Conference was making your own observatory. The leadoff speaker was the Eastbay's own Mike Rushford. Mike is one of the most remarkable amateur astronomers your program director has ever met. He got his start as a young man going to Stellafane. He now works as a technician at Lawrence Livermore Lab. He is a wonderful example of what happens to young people when they are exposed to telescope making. I am convinced that he could come out of a junkyard with all the equipment needed to build a full-fledged research observatory!

At this meeting Mike will tell us how he built his own solar robotic observatory and how you can use his experience and suggestions to build your own observatory, robotic or not. He will also tell us how we can log on the net and control his observatory by remote control to see images of the sun in hydrogen-alpha light. He'll show us some beautiful video of some of his results. If you're interested I urge you to check out Mike's website at eyes-on-the-skies.org

A physicist at LLNL for 26 years, Mike holds a patent for the 4-Optic-System, has appeared in numerous publications,

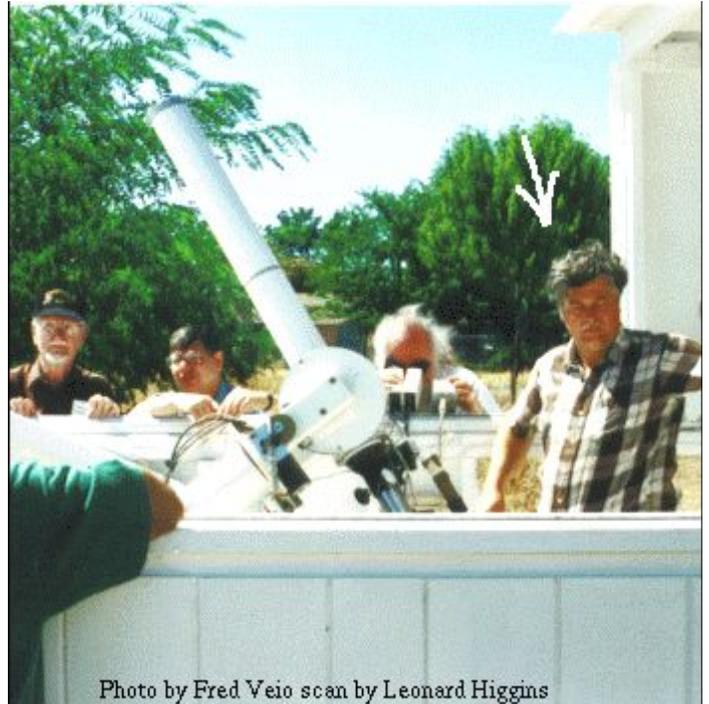


Photo by Fred Veio scan by Leonard Higgins

Mike Rushford (arrow) manually operating the robotic solar telescope at Mt. Wilson in southern California

made a spectroheliograph at the age of 15, owns 8-telescopes, one of which is robotic, built an observatory, is a design/electronics/computer network/programmer/Linux-guru, and pioneered web-accessible, remote control solar observatories back in the mid-90's. ★

DINNER WITH THE SPEAKER

5:30 pm
 Saturday, July 12, 2003
HUNAN YUAN
 4100 Redwood Rd., #11
 (next to Safeway)
 Oakland
 (510) 531-1415
 Contact Dave Rodrigues
 at 510/483-9191 or
 daverod@aol.com by Fri-
 day, July 11th to confirm

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Globular Clusters Dominate the Summer Skies

“They’re all the same, and each one is different”

By Jim Scala



M13

In 1948, M13, the globular cluster in Hercules was the first deep sky object I ever saw in my homemade 3 inch telescope, and it was just a hazy round smudge. Since then, I have seen M13 more times and through more telescopes than I can recall, but since that night in 1948 it will always be the King of Summer skies. Summer skies are rich with easily resolved globular clusters which at star parties always elicit a “Wow” from visitors young, old and jaded by experience. What’s really nice is that most are easily resolved in a five inch telescope. Globular clusters exemplify the Japanese saying about maple leaves: “Maple leaves are all the same and each one is different.” The seven images of summertime globular clusters clearly illustrate that saying, and can also be applied to globular clusters. Each image is a 15' by 15' field of view, and they are all beautiful while being all at once the same and yet different.

M13, the undisputed *King of Summer Skies* is often the star party showpiece because it’s so easily and clearly resolved and its high declination puts it above most of the bay area haze. However, M14, M12 and M107 all low in declination are easily resolved making similarly beautiful showpieces. In contrast to the others M107 is seldom observed and appears quite different, which makes it a nice comparison cluster.

An interesting exercise in stellar distances can be accomplished by comparing M53 and M13 using imaging technology. They are similar clusters (Concentration V; Spectral Type F6), but M53 is 60 ly distant and M13 is 21 ly away. So,

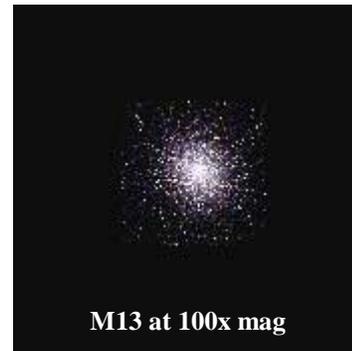
magnify M13 about 100 times to get good resolution and then show M53 at 300 times to provide a comparison as if seeing both from the same distance. I have done this comparison with the M13 CCD image which you can compare to the M53 image and see how they might appear if they were at approx the same distance.

Clusters usually are generally considered “old” as stars go since they formed early in our galaxy’s history. The abun-

dance of blue stars suggests they are generally “metal poor” and don’t exhibit an extensive periodic table of elements. In 1993, astronomers reported that new globular clusters form in dust-rich colliding galaxies. It seems to me that these newly formed globular clusters should be populated by metal rich stars. Will some contain stars like our sun? Imagine living on a planet where stellar distances are measured in light days and weeks rather than light years like our nearest stars. Imagine that you could see other solar systems with large telescopes. What an incentive for space travel. ★

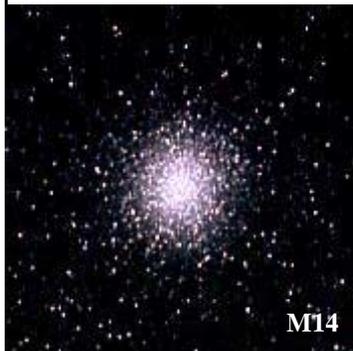


M53 at 300x mag

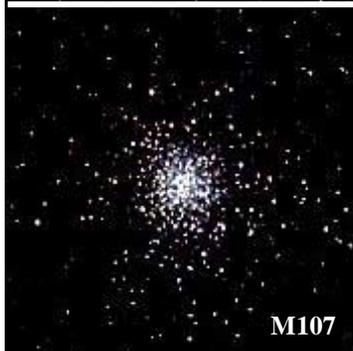


M13 at 100x mag

A side-by-side comparison of M53 and M13, corrected for differences in distance to get a meaningful size comparison. Theoretically, because M13 is only 21 ly away, and M53 is roughly 3x as distant at 60 ly away, if you photograph M13 at only 100x magnification, and M53 at 300x, if they’re intrinsically the same size, they should appear the same size in the photographs.



M14



M107

Changes at Chabot

Effective July 1, 2003: General Admission is now \$11 adults, \$8 youth/seniors, and includes a planetarium ticket. MegaDome tickets and evening/special planetarium show tickets are \$6 adults, \$5 youth/seniors. Parking is now free.

The Membership Pgm pricing structure will also be revised, soon. Check their website for info when it becomes available.

The AC Transit bus line has converted to an “on-demand” system. Groups of 20 people or more may request service between 9:00 am and 3:30 pm by calling (510) 891-4966 at least 48 hrs in advance for pickup at the bus line’s regular fees. ★

EQUIPMENT FOR SALE

For Sale **MakNewt atop Losmandy GM-8**

I Have Intes Micro MN-56 with JMI-DX-1, 2 speed focuser & Hard Dew Shield, mounted w/ Parallax custom Rotating Rings (yowsa!). Sits atop Losmandy GM-8 w/polar scope ; upgraded motor housings ,knobs, Access. tray, ,2 universal plates. Have custom wheeled "thermadyne" transport case that fits assembled scope. GM-8 Head has separate Doskocil hard case. Original Owner of all gear. SWEET Rig. SF Bay Area preferred for Inspection and sale (ask \$3000); do check "new" prices for the package (\$3500 + tx & shipping). Member EAS. "Moving on Up" to L A R G E scope. **contact** harrysue@jps.net

Spare Shots

This month's collection as gathered from various contributors. Enjoy, enjoy!



◀ Bill Marriott, volunteer instructor at the Telescope Makers' Workshop, does a Ronchi test of his son's mirror.



◀ Even the accursed "Oakland Nebula" couldn't dampen the spirits of event-goers at Nellie's unveiling

▶ Bill's son at the other end of the Ronchi test bench



▶ CSSC members and volunteers got much luckier with the weather for their "Nellie Intro" events



◀ Paul Zurakowski showing the results of the Ronchi test on the Apple



◀ Mark Vandewettering got a great wide-angle shot of Wightman Plaza

▶ Contrary to popular belief, glass pushers don't necessarily have to have the arms of a wrestler and the temperment of a Buddah to get the job done



▶ Your EAS Board of Directors, hard at work



And that's all for now! ☆



Editor's News 'n Views

Greetings Astro Fans! This was a truly momentous month, with the opening of Chabot's first new major telescope in 88 years! As most of you will recall, back in the late 1800s, Anthony Chabot donated the funds to begin the Oakland Observ-

atory (which everyone called "Chabot Observatory," despite Chabot's request that the facility not be named for him). In 1883, the 8" refractor we now know as "Leah" was built by one of the finest telescope makers of its day - Alvin Clark & Sons of Cambridgeport, MA - and installed in the new observatory. Then, after years of lobbying by the Director of the observatory, Charles Burkhalter, the City of Oakland released the rest of Anthony Chabot's legacy funds to have

Lillian Martin, and the **US Air Force** and **City of Oakland**. Chabot Space & Science Center held a private unveiling in honor of the major donors to the project on Summer Solstice, Saturday, June 21, 2003. Unfortunately, the weather did not cooperate, and the fog got so thick at times, it was hard to see the guest speakers at the podium if you were too far in the back. Fortunately, on the 23rd, 24th and 25th (Monday, Tuesday, and Wednesday), more events were held to honor Chabot's volunteers, and the weather during those days were nice, clear, and on Wednesday, it even got *too* warm at night, for a change. On the following Friday and Saturday, the public were finally able to do their own (as usual) free public viewing through Nellie, and that marked the beginning of this fabulous telescope's true mission: to bring the wonders of the universe to the public; to educate, entertain, and enlighten all comers.

Besides that, we are coming down to the wire on getting the combined Chabot/EAS library project finished. Anne and Frank Creese still need all the help they can get, so if you've got Saturday afternoon on July 5th free, please do come to help out this extremely worthy cause. It may not be as big or showy as a new telescope, but the Library is another mighty tool to be used in developing future astronomers, astronauts, and space scientists, whose contributions to the world may well echo down through the coming ages. Contact the Creeses at (510) 638-1702 for more information about this truly worthy project! (Did I already say that?)

And now for some sad news: at age 96, our oldest and longest-term member, **Harriet E. "Betty" Neall**, died peacefully on June 7, 2003. I don't have enough room here to list her many achievements in life, and her contributions to the EAS, but they are the stuff of legend. If you get a chance, visit the EAS' website, where we memorialized her in a much more worthy manner. Please note that there are two funds going that we encourage you to participate in; one is the **Betty Neall Youth Award of Merit**, which recognizes and rewards outstanding young amateur astronomers at each Annual EAS Awards Dinner event; the other is a fund to "buy a chair" in Chabot's planetarium, where a small brass plaque with Betty's name will be set for her, in memoriam. Please send all donations in check or money order form to our Treasurer, Don Stone, at his address listed on the back page.

And that's it for now! Hope to be seeing you sometime, **IN THE FUTURE!** ☆



Clockwise from r: Dwayne Osland, Lillian Martin, Nellie, Merrill Martin, and Alexandra Barnett at ribbon-cutting ceremony. Photo by Carter Roberts

Warner & Swazey of Cleveland, Ohio, build a 20" refractor, the one we now know as "Rachel." At the same time, the observatory fled its increasingly light-polluted downtown location to its Mountain Boulevard location; the "progress" of electric street lamps to blame. *Fast forward 86 years:* Chabot Observatory moved again in 2001 to its latest location atop the Oakland hills on Skyline Blvd, and changed its name to Chabot Space & Science Center. It almost seemed to be a tradition that when Chabot Observatory moves, it gets a new and bigger telescope, so this time around, a 36" classic Cassegrain, was originally conceived by, of all people, our Treasurer, **Don Stone!** I'll try to get more details on how this all got started, but that's what I've got, for now. It was designed and built by renowned telescope maker **Kevin Medlock**, and majorly funded by private donors **Merrill and**





Chabot Space &
Science Center
Presents:
"SUMMER OF
MARS"
lecture series

With Mars approaching its
best view from Earth in over
10,000 years leading scientists

in the field of Martian exploration will take us on journeys to the
Red Planet through the latest in research.

Thursday, July 10, 2003 7:30 pm
Taylor Perron of UC Berkeley
Water & the Martian Landscape

The quest for locating water on Mars is the key to understanding its
past, interpreting its present and humanizing its future.

Thursday, July 24, 2003 7:30 pm
Nathalie Cabrol of SETI & NASA
The MERS: Mars Exploration Rovers

Dr. Cabrol is a Planetary Geologist and a Principle Scientist with
NASA's Mars Exploration Rovers. She'll provide an update with the
latest on the Mars Explorations Rover Missions.

Saturday, August 9, 7:00 PM
(sponsored by the Eastbay Astronomical Society)
Dr. Chris McKay of NASA

Mars: the Search for Life on the Red Planet
Dr. McKay is part of the team that announced the possibility that
fossilized microbes exist inside Martian Meteorite ALH84001. He
will tell us about the experience and what it means to our under-
standing of the history of the solar system.

Thursday, August 21, 2003 7:30 pm
Dr. Margaret Race of SETI

Mars, Astrobiology and Planetary Protection
Hear one of the most renowned experts in planetary protection, the
discipline of keeping Earth microbes from contaminating other bod-
ies we visit. Dr. Race will tell us why such protocols are important
in our plans to explore our nearest neighbors in the quest to find life.

Thursday, August 28, 2003 7:30 pm
Drs. Tim McCoy & Cari Corrigan from the Smithsonian Institution
Martian Meteorites: What They Tell Us About Mars & Life

Take a look through the eyes of a geo-biologist and a meteorite ex-
pert at what rocks from Mars can tell us about the formation of our
solar system and the life that may have existed in those early forma-
tive periods. View Martian Meteorite ALH84001 during special
public workshops Aug. 26, 27 & 28 free of charge

Saturday, August 30, 6:30 pm
William Hartman
Travelers Guide to Mars

Internationally known astronomer and artist William Hartman takes
us on travelogue to Red Planet in this look at what a tourist to Mars
would discover. ☆



MEMBERSHIP APPLICATION FORM

(Please print clearly)

Name: _____

Address: _____

City: _____

State/Zip: _____

Email: _____

Day Phone: _____

Eve Phone: _____

Do not print address in Membership Directory listing

MEMBERSHIP CATEGORIES:

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

Optional discounted magazine subscription:

- Sky & Telescope \$32.95
- Astronomy \$29.00

Optional tax deductible donations:

- Burns Library \$ _____
- General Fund \$ _____

Total Enclosed: \$ _____

To help save the club money, I prefer to receive the
newsletter in digital format.

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

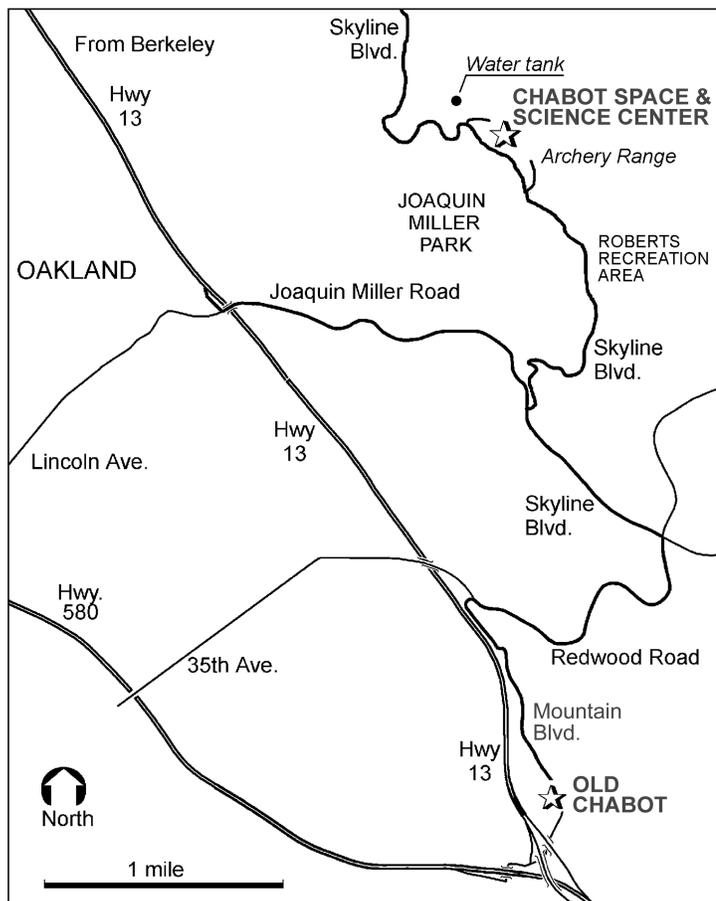
Eastbay Astronomical Society
19047 Robinson Road
Sonoma, CA 95476-5517

For more information, contact Treasurer Don Stone at:
(707) 938-1667, or ddcstone@earthlink.net, or the address above.



Eastbay Astronomical Society

At Chabot Space & Science Center
 10000 Skyline Boulevard ● Oakland, CA 94619
 July 2003
 RETURN SERVICE REQUESTED



FUTURE CONJUNCTIONS

- July 5 2:00 – 5:00pm Library Work Party (last one B4 opening!)
- 10 7:30pm EAS Board Meeting at Chabot
- 12 7:30pm EAS General Meeting at Chabot
- 24 – 30, Annual Barcroft High Altitude Star Party
- Aug 9 7:00pm EAS General Meeting at Chabot
- 14 7:30pm EAS Board Meeting at 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 issue is July 19, 2003. Items may be submitted by mail to the editor, Don Saito, 3514 Randolph Avenue, Oakland, CA 94602-1228. Internet email address: donsaito@pacbell.net Hm: (510) 482-2913.

Join the Eastbay Astronomical Society

- Regular, \$24/year
 - Family, \$36/year
 - Contributing, \$40/year
 - Student, \$15/year (digital)
 - Sustaining, \$60/year or more newsletter, only
- Contact: Don Stone, EAS Membership Registrar
 Telephone: (707) 938-1667 Email: ddcstone@earthlink.net
 Mail: 19047 Robinson Road, Sonoma, CA 95476-5517