

The Refractor

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

Volume 79
 Number 6
 February 2003

In memoriam – February 1, 2003



Commander Rick Husband, 45, Air Force colonel, Amarillo, TX
 Pilot William "Willie" McCool, 41, astronaut, Lubbock, TX
 Payload Commander Michael Anderson, 43, astronaut, Spokane, WA
 Mission Specialist Kalpana Chawla, 41, astronaut, immigrant from India
 Mission Specialist David Brown, doctor and pilot, Virginia
 Mission Specialist Lauren Clark, 41, naval flight surgeon, Racine, WI
 Payload Specialist Ilan Ramon, 48, first Israeli astronaut, Tel Aviv, Israel

What Your Astronomy Book Won't Tell you *by Norm Sperling*

Saturday, February 15, 2003, 7:30 pm
 Physics Lab, 2nd Floor, Spees Bldg
 Chabot Space & Science Center, Oakland

Norm Sperling has taught thousands of introductory astronomy students what their textbooks won't tell them. Some didn't get it. He's carefully probed the reasons why, and puts the best, student-proven ways to master astronomy into his new book, *What Your Astronomy Textbook Won't Tell You*.

❖ Outdated viewpoints? Reset your mindset to the latest issues. The debate about whether Pluto is a planet isn't about Pluto; experts no longer agree on what "planet" means.
 ❖ Too sure of things? Learn which Unknowns still stump astronomers. What's inside stars? What's a magnetic field?
 ❖ Do you like a good detective story? Find out how the Northern Lights confounded evidence for the



Loch Ness Monster. ❖ Want fresh ideas and new angles? Find out why galaxies pictured in textbooks and magazines are NOT typical. And enter a contest to make selections fairer. ❖ Want to dodge a scam? Find out why you should beware of buying a star. ❖ Too serious? Chortle at student boners...which point out mistakes to wisely avoid. Norm Sperling was Science Editor at AltaVista.com, an editor of Sky & Telescope, and a planetarium director. He will sell copies of his book for \$24.95 + tax = \$27. Autographing: free. ★

DINNER WITH THE SPEAKER

5:30 pm
 Saturday, Feb 15, 2003
HUNAN YUAN
 4100 Redwood Rd., #11
 (next to Safeway)
 Oakland
 (510) 531-1415
 Please call Betty Neall at 510/533-2394 by Friday, February 14th to confirm your place.

Inside This Issue:

Gerard Kuiper	2
Awards Dinner Form	3
John Glenn Dinner	4
Marcy Auction	4
Editors News 'n Views	5
Spare Shots	6
Notices	6
Membership Form	7

Gerard Kuiper

by Ellis Myers

Gerard Kuiper was an outstanding student in his formative years in Holland, which led him to try for a career as a primary school teacher.

Entering Leiden University in 1925, Kuiper and fellow student Bart Bok learned from Jan Oort, among other professors. Having completed his B.Sc. degree in 1927, Kuiper was pursuing graduate studies when he went to Sumatra with the Dutch total solar eclipse expedition. During eight months in Sumatra, he learned Malay and studied the local customs, painting village and beach scenes. On the eve of the eclipse he discovered that someone had wrongly oriented the spectrographic slit on one of the cameras. He was able to correct this error in time for a successful experiment the next day.

Having received his Ph.D. in 1933, he came to Lick Observatory as a Kellogg Fellow, working on binary stars. After two years Kuiper left to spend two years at Harvard College Observatory; then he moved to the University of Chicago's Yerkes Observatory under Otto Struve. In 1939, having contributed in the planning of a new 82-inch telescope for the University of Texas McDonald Observatory, Kuiper began using that telescope, second largest in existence at the time, to acquire data on faint stars. Then there was World War II, and he joined Harvard's Radio Research Laboratory and was involved in

radar countermeasures. In 1945, according to Dale Cruikshank's biography, "Kuiper accomplished a rather daring rescue of Max Planck, who he learned was in the eastern zone of Germany in dire circumstances and in danger of being captured by Soviet troops. He took a vehicle and driver and raced across the countryside to Planck's location, arriving only hours ahead of the Soviets. Planck and his wife were taken to the western zone and then on to Göttingen and to the care of friends and relatives."

In a trip to McDonald Observatory in the winter of 1943–1944, taking a temporary leave from his war-related research, he had the opportunity to discover the methane atmosphere of Titan, the first detection of an atmosphere on any satellite. Later, in 1947, he was to discover the presence of carbon dioxide on Mars. His interest in planetary atmospheres continued. In the course of these studies, Kuiper discovered the fifth satellite of Uranus, naming it Miranda. A year later, he found the second moon of Neptune, Nereid.

Kuiper became director of McDonald and Yerkes observatories in 1947, succeeding his mentor Otto Struve, but left this post after two years, resuming it in 1957. His chief interest during these years was the origin of double stars. He made the assumption that double-star systems were nearly

universal, and that our Solar System was an "unsuccessful" double star, with the "companion mass spread out radially into a disk that in time developed the planets."

In 1960, Kuiper resigned his positions and moved to the University of Arizona in Tucson, where he established the Lunar and Planetary Laboratory, dedicated to a multidisciplinary approach to the study of the Solar System. This marked the beginnings of the Kitt Peak observatories. Kuiper was also instrumental in the development of other observing sites, including Cerro Tololo in Chile and Mauna Kea in Hawaii.

In the words of his student Dale Cruikshank, "As an individual who initiated physical studies of the solar system, Gerard Kuiper can truly be considered the father of modern planetary astronomy. At the same time, his contributions to stellar astronomy remain a fundamental part of the literature of double-star studies . . . and infrared stellar spectroscopy." Born December 7, 1905, Gerard Kuiper was on a trip to Mexico with his longtime friend and colleague, Fred Whipple, in search of premier observing sites when he died at age 68 in 1973.



Kuiper Belt Objects

Kenneth Edgeworth was the first to speculate on the existence of planetary material beyond the orbit of Pluto. Referring to the solar nebula, he wrote, in 1943, "It is not to be supposed that the cloud of scattered material which ultimately condensed to form the solar system was bounded by the present orbit of the planet Pluto; it is evident that it must have extended to much greater distances." He also suggested that the transPlutonian region was the source of the comets: "From time to time a member of this swarm of potential comets wanders from its own sphere and appears as an occasional visitor to the inner regions of the solar system."

Credit for this concept is given to Kuiper, who, in 1951, asserted that this was a more likely scenario than that comets formed near Jupiter and had a composition like that of the main-belt asteroids, as had been suggested by Jan Oort.

In the late 1980s, a number of researchers were attempting to observe the postulated Kuiper Belt Objects, but not until 1992 did David Jewitt and Jane Luu actually discover the first of these faint and distant asteroids, QB1. Immediately following their observation from Mauna Kea, a rapid rate of discovery took place, until there are currently more than 564 KBOs recorded (as of October 6), with 62 having been reported during 2002.

Kuiper Belt objects are best identified by their slow, retrograde (westward) motions when observed in the anti-solar direction. They are seldom found more than 20° from the

Continued page 7

Eastbay Astronomical Society

Seventy Ninth Anniversary Dinner

Sunday, March 16, 2003

Astronomy Hall of Chabot Space & Science Center

10000 Skyline Boulevard, Oakland

We will again be in the Dellums (west) building of CSSC. This is where the “Planetary Landscapes” exhibits are. We are on Sunday this year to avoid impacting CSSC’s schedules. We plan to open the doors by 6:00 p.m. and have **Dinner at 6:45 p.m.** Awards presentation, door prizes and lecture about 8:00 p.m.

Our speaker will be Dr. Harold Weaver, Professor Emeritus, UC Berkeley.
“Movies Made from Observational Data: A New Way to Study the Galaxy”

Harold has spoken to us many times since 1946, primarily at our Annual Dinner. In 1948 he told us about “The material between the stars,” and in 1976, “Explosive Events in the Gas of Our Local Spiral Arm.” For the last several years he has been devising a variety of novel ways to study the local interstellar medium in an effort to understand its large-scale structure. Local here means out to a distance of at most a kiloparsec. He will tell and show us what he has found.

Assuming no paperwork problems that delay her move to the United States, we will also hear from **Alexandra Barnett**, Chabot’s new Executive Director who begins work on March 1. She is coming to us from the National Space Science Center in Leicester UK. (See <http://news.bbc.co.uk/1/hi/sci/tech/1394524.stm> and <http://www.nssc.co.uk/>)

We will be presenting the **Helen Pillans Award** to **Ellis Myers** for his many years as Editor for EAS and the Mt Diablo Astronomical Society, and his wonderful constellation articles.

The dinner will again be catered by **Harry’s Hofbrau** and will feature Roast Beef, Turkey, Ham and Spinach Lasagna. This dinner received rave reviews the past seven years.

Cost per person will be \$30.00. Make checks payable to EAS and mail as soon as possible with the form below to Don Stone, 19047 Robinson Rd., Sonoma, CA 95476-5517, or bring it with you to the next meeting, or give it to Carter Roberts at CSSC some Friday evening. To guarantee a seat at the banquet get your reservation in soon. We must give the caterer a final count by March 10. Questions? Call Don at (707) 938-1667, or email ddcstone@earthlink.net More information next month.

EAS Banquet Reservation: March 16, 2003

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

Your name(s): _____

Phone: _____ Email: _____

Please make your check payable to the EAS and send it with this form to:

EAS Banquet
Don Stone
19047 Robinson Road
Sonoma, CA 95476-5517

An Evening with John Glenn at Chabot Space & Science Center

You are cordially invited to attend "An Evening With John Glenn" on Sunday, March 2 at 6 p.m. Tickets are \$100 each and benefit the Global Children's Organization (GCO). As a partner with GCO, Chabot will be hosting a Special Private Reception for 50 guests following Senator Glenn's speech. Tickets for both the program and the reception are \$300 (\$200 of this amount goes to Chabot as a fundraiser.) Please contact Development Associate Christine Whitfield to reserve your seats today by calling 510-336-7338 or email her at cwhitfield@chabotspace.org. Special thanks to MBT Architects and The Clorox Company for their generous sponsorship. Program highlights -- John Glenn will talk about his life as a NASA astronaut and narrate his 1998 Space Shuttle Mission video. He will also speak about his current service learning initiative through the John Glenn Institute, and a Q&A session will follow. The evening will also feature the Oakland Youth Chorus and an ice cream social, compliments of Fenton's Creamery. Immediately following the program, Chabot will host a Special Private Reception honoring Senator Glenn and his wife Annie, at which time reception guests will have the opportunity to meet them both. Tickets to the Private Reception also include reserved seating in the Planetarium. (The program/video will be simulcast to the Theater with Q&A sessions in both venues with John Glenn personally). ★



One way to raise money *fast*

23 January 2003

By Robert Sanders, Media Relations



BERKELEY - To astronomers, staying up all night scanning the sky via computer monitor becomes routine. But one amateur astronomer is paying \$16,000 to spend a night observing with UC Berkeley's stellar planet hunter, Geoffrey Marcy.

An anonymous buyer with the moniker `wc4600` emerged the winner when eBay bidding stopped Thursday morning, Jan. 23, on a Hawaiian getaway that includes a night with Marcy at the controls of the world's largest optical telescope. Proceeds go toward education efforts of the Astronomical Society of the Pacific (ASP).

The auction winner gets a trip for two to the Big Island of Hawaii, a behind-the-scenes tour of the W. M. Keck Observatories near the 13,796-foot summit of the dormant Mauna Kea volcano, dinner with Geoffrey Marcy, and the unique experience of observing from the Keck I control room at the base of the volcano in Waimea. ★

Editor's News 'n Views

Whoa. Two recent disasters have delivered space science the world over a double kick in the gut: The Mt. Stromlo Observatory in Australia was destroyed in a fire, and the Space Shuttle *Columbia* exploded during re-entry on Saturday morning, February 1st, killing its entire crew.



Dr. Mike Reynolds being interviewed by media about the space shuttle disaster. He was once a candidate for the Teacher in Space program; the one where Christy McAuliffe died in the 1986 space shuttle disaster.



Before and after photos submitted by Carter Roberts (Nov 2002 and Jan 2003)

Columbia: Knowing the clouds would prevent any view of the shuttle fly-by on the morning of Saturday, February 1, I was asleep when Alan Roche called me up with the bad news: the shuttle blew up. I was hoping I hadn't heard him right when I replied, "what??" As of this writing, no one knows why it happened or what caused the explosion; they're still trying to gather up as much information as possible. This was *such* a bitter loss; when NASA sends people up into space, they are the best of the best, the tops of their classes, and as fit as Olympians. They knew the risks, and yet dared to continue on in order to improve the world and further humanity's knowledge and understanding of the universe. This is as noble as undertakings get, and we shall remember and honor them for that.

Stromlo: David Higgins from the Hunters Hill Observatory, Canberra, Australia, forwards the following note from Mike Sidonio: A sad day for Australian astronomy - it appears Mt Stromlo has been destroyed by bushfire - just received the following report: "Sadly I have just

seen the aerial pictures of Mt Stromlo observatory and spoken with Vince Ford, an astronomer on Mt Stromlo and our worst fears have been realized:

- Laser ranger facility - gone
- 9" Oddie refractor - gone
- 26" Yale Columbia refractor - gone
- 50" Great Melbourne Telescope - gone
- 30" - might be ok?
- 18" Upsala dome (Canberra Astronomical Societies dome) - gone
- 74" - damaged but true extent of damage unclear.

(The) original administration building including two small domes housing old refractor and solar scope - gone. Workshops - gone. Main admin building - at least water damaged but may be worse!

A sad day for southern hemisphere astronomy.

In spite of the pain we feel from our losses, we're still here, and while we are, we'll still keep plugging onward and upward, continuing our quest for enlightenment into the uncertain future, just as we always have, no matter what the cost.

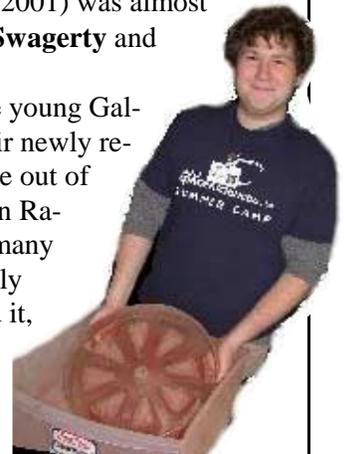
On a more local level, Chabot Space & Science Center's search for a new executive director is over: **Alexandra "Alex" Barnett** from England takes the reins on the first of March, and both Carter and Terry are mighty impressed with her; full of energy and enthusiasm, she also seems to have a keen sense of what is needed and what is right for our favorite science center. She'll introduce herself to the EAS at this year's Awards Banquet (details on this event elsewhere in this issue).



Alexandra Barnett signs her contract as the new Executive Director of the Chabot Space & Science Center as Chairman of the Board Glen Dahlbacka looks on. She begins full time work on 1 March.

The adjustable chair broke recently on the antique rolling Observation Platform (which was also refurbished by the Leah restoration team back in 2001) was almost immediately fixed again by **Ken Swagerty** and **Carter Roberts**. Thanks, guys!

And finally, **Jake Siegel** of the young Galaxy Explorers, proudly shows their newly refigured 16-inch mirror which came out of the Dublin telescope (on display in Rachel's dome). It took their group many months of labor to fix the originally flawed configuration, but they did it, and it's on its way right now to Lick Obsy, to get coated along with Nellie's 36-inch mirror. ★



Spare Shots



◀The projector at Morrison Planetarium in San Francisco's California Academy of Sciences. They'll be getting a new "all-sky" video projection system in the not-too-distant future.

▶A closeup shot of the 16" Dublin Telescope mirror, recently refigured and repolished by the Galaxy Explorers in the Telescope Makers' Workshop



◀Carter was killed and eaten soon after taking this picture of these fearsome and ravenous denizens of the night. (Not really.) (Ken Swagerty's grandkids Lacy, Zack, and Trouble, ah, that is, Travis.

▶Your tax dollars at work! EAS Board Members meet once a month to discuss plans and schedules for upcoming events.



◀Dave Rodrigues, aka the Astro Wizard™ shows the sky to kids and parents at Family Science Night, Grass Valley Elementary School in Oakland.

Notice about Members' Only view night

The next one is **tentatively** scheduled for Sunday evening, March 2. Call Don Saito – (510) 482-2913 – a few hours before heading up to find out if we are good to go. There may be an event happening at that time, which may preclude a view night on that date.

Also, these Members' Only view nights have not yet been very well attended, with only a handful of members showing up each time we have them. This is "okay," as it means more viewing for the rest of us, but you should be aware that we're having an awful lot of fun doing these little events, and this last one (Sunday, February 2) was almost magical. The skies were clear, stable, and the temperature was almost pleasant. Considering we're still in the throes of Winter, that was a rare and beautiful thing! Member Josh Qin brought his family and a computerized telescope that he'd had for a few years (but could never figure out how to set up), and we showed him how to set it up and operate it.

One last thing: Daylight savings time kicks in on April 6th this year. After that, it doesn't get dark until 9:00 p.m., which might just kill off these "view night" events until the return of Standard Daylight Time.

Just FYI.

New Planetarium Show at Chabot!

The new planetarium show, "Sky Quest," narrated by Roxanna Dawson (B'Elanna Torres of Star Trek: Voyager) begins on January 25 and tells the story of a young woman on her personal quest to find a special place in the night sky, all the way to her becoming an astronomer and building a mountain observatory. Purchase advance tickets online through TicketWeb, or call their box office at (510) 336-7373. (Please note: Triple Venue tickets are not available through TicketWeb.)

National Dark Sky Week

National Dark Sky Week occurs from April 12th to April 19th from 10-12 pm (Eastern and Mountain Times) and 9-11 pm (Central and Pacific times). National Dark Sky Week (NDSW) gives people a chance to see the sky as our ancestors saw it hundreds of years ago. The sky has long since been forgotten by many and it is my wish that every person in America will be awed by the splendor of the universe.

To participate in this event, spread the word, turn out your lights, and see the greatest show the universe has to offer! Jennifer E. Barlow – Director and Founder of NDSW astronomer107@comcast.net

Kuiper (cont'd from page 3)

ecliptic, so they must be in the form of a ring, rather than as the spherical Oort cloud. They lie at distances of from 30–50 Astronomical Units.

KBOs fall into three distinct subgroups: those with near-circular orbits beyond 42 AU; “Resonant” KBOs with orbit periods that have a simple numerical ratio to that of Neptune; and a few “Scattered” KBOs, with large, highly eccentric (noncircular) and highly inclined orbits. Those with resonance of 3:2 are the most numerous, and indeed include Pluto, which is now coming to be known as the largest and brightest of the Kuiper Belt (or TransNeptunian) Objects. Pluto’s period of revolution about the Sun is 246.7 years; Neptune’s is two-thirds of that, 163.9 years.

Any theory to explain the origin and evolution of the Kuiper Belt is still nebulous today, although astronomers are making steady progress. The study of these interesting Solar System members is of much value in the study of other fields of astronomy, such as to shed light on how stars form.



Quaoar compared to the diameters of other Solar System bodies

KBO 2002 LM60 was discovered in June by Michael Brown and Chadwick Trujillo, with the 48" Palomar telescope. On October 7 they announced that they have followed the discovery using the Hubble Space Telescope to determine its size at 1300 km in diameter, more

than half that of Pluto. The astronomers have suggested the name Quaoar for the remote 18.5-magnitude object, after a creation god of the Tongva tribe, who were original inhabitants of the area where Caltech is located. Quaoar (kwa-o-wahr) descended from heaven, brought order from chaos, then created the animals, and then mankind. For the latest information on this discovery and an ephemeris, go to <http://www.gps.caltech.edu/~chad/quaoar/> ☆



MEMBERSHIP APPLICATION FORM

(Please print clearly)

Name: _____

Address: _____

City: _____

State/Zip: _____

Email: _____

Day Phone: _____

Even 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 \$29.95
- 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:

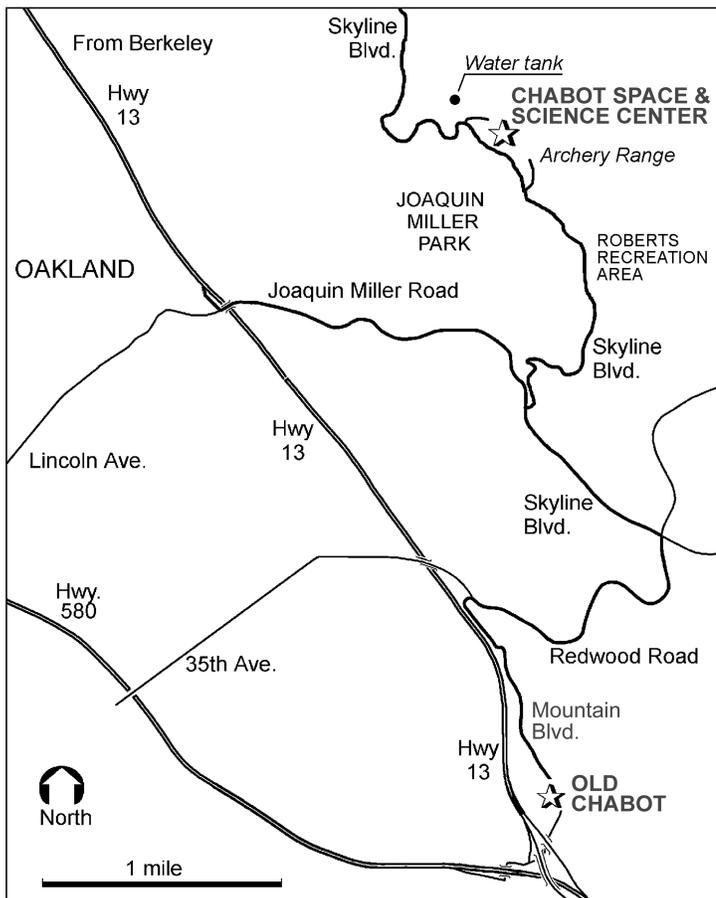
Eastbay Astronomical Society
19047 Robinson Road
Sonoma, CA 95476-5517

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

February 2003
RETURN SERVICE REQUESTED



FUTURE CONJUNCTIONS

Feb 13 7:30pm EAS Board Meeting at Chabot
 15 7:30pm EAS General Meeting at Chabot
 22 2-5pm EAS Library work party, Chabot
 Mar 2 7:00pm Members' Only Night (tentative*)
 13 7:30pm EAS Board Meeting at Chabot
 15 7:30pm EAS General Meeting at Chabot
 Apr 10 7:30pm EAS Board Meeting at Chabot
 19 7:30pm EAS General Meeting at Chabot

*Call Don Saito to confirm at 510 482-2913, Sunday, Mar 2

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 March issue is February 22, 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