



The Refractor

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

Volume 81
 Number 4
 February 2005

February 2005 talk:

*How Lonely is our Planet?: New Results
 in the Quest for Alien Life*

Saturday, February 19, 2005, 7:30 pm

Speaker: Dr. David Grinspoon

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

In a talk illustrated with provocative and striking space imagery, astrobiologist David Grinspoon will discuss the intriguing new results from NASA's planetary exploration missions. In particular, he will describe the ongoing adventures of our robotic explorers on Mars, new ideas about life on Venus, the latest findings from Saturn's moon Titan, and how these discoveries inform our changing views about life elsewhere in the universe.

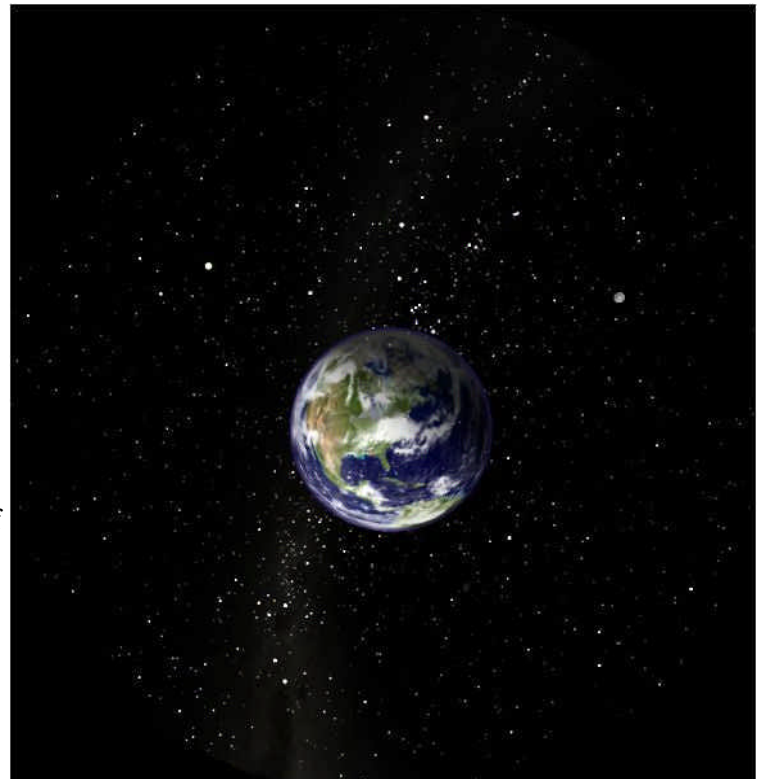
Award-winning writer David Grinspoon is an internationally known Planetary Scientist funded by NASA to study the evolution of Earthlike planets elsewhere in the universe. He is currently Principal Scientist in the Dept of Space Studies at the Southwest Research Institute in Boulder, CO, and Adjunct Prof of Astrophysical and Planetary Science at the University of Colorado. He also serves as an advisor to NASA on space exploration strategy, and has lectured and published widely.



His first book, *Venus Revealed*, was a Los Angeles Times Book Prize finalist. His latest book, *Lonely Planets: The Natural Philosophy of Alien Life* won the 2004 PEN literary award for nonfiction. His popular writing has appeared in Slate, Scientific American, Natural History, The Sciences, Astronomy, the Boston Globe, the New

York Times and the Los Angeles Times. His technical papers have been published in Nature, Science, and numerous other journals. Dr. Grinspoon has been featured on numerous television and radio shows, including PBS's "Life Beyond Earth," BBC's "The Planets," NPR's Science Fridays and Weekend Edition, and BBC World Service. He is also an award-winning musician who has played guitar and sung in several great bands destined for obscurity. Grinspoon lives in Denver.

After the lecture he will sign copies of the newly released paperback edition of *Lonely Planets*, which includes the amazing advances and discoveries made in the last year. ★



Next Month!

The Eastbay Astronomical Society 2005 Annual Awards Dinner

with special guest speaker

NASA Astrobiologist

- **Chris McKay** -

on the Cassini-Huygens

Space Probe Mission to Saturn

Sunday, March 13, 2005

Registration form inside

DINNER WITH THE SPEAKER

5:00 pm

Saturday, February 19

HUNAN YUAN

4100 Redwood Rd., #11

(next to Safeway)

Oakland

(510) 531-1415

No need to confirm—just
 show up!

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Antarctica, The South Pole, and Meteorites

I have just returned from Antarctica and thought some might enjoy a quick expedition overview. In the words of Apollo 11 astronaut Buzz Aldrin (in describing the moon): *Magnificent Desolation*...and I have images to prove it too!

After being outfitted in Punta Arenas, Chile (the South American base for both Antarctic Logistics Expeditions (ALE) and some of the other Antarctic expeditions), I decided to make things more complicated by spraining my right ankle. After a day (and the Emergencia Clinica Magellanas) I was almost good to go. A little slow but ready.

The weather in Antarctica is as challenging as everyone reports, even in the summer when I went on my expedition. (Remember it is the Southern Hemisphere and our winter is their summer). You do not forecast the weather—you nowcast. Imagine looking at a satellite photo and seeing white. Is it clouds or snow and ice? And the weather changes so quickly there; we found ourselves weather-delayed four different times, and six days late in returning home.

An Ilyushin IL-76 (Russian) cargo jet was used to transport us and supplies like aviation fuel into the Patriot Hills Station, which is located at approximately 80 degrees S latitude and 81 degrees W longitude. This can be the most dangerous part of the expedition, because of brutal crosswinds and the fact that the Ilyushin is landing on blue ice. We were told that the last thing you want, either on landing or takeoff, is to become weathercocked (when the crosswinds are too strong and simply spins the IL-76 around, with possibly catastrophic results). But the arrival weather was actually nice:



Dr. Mike Reynolds standing at the southernmost spot on the planet; the "bottom," so to speak. (It makes one dizzy just thinking about it!)

only minus 7 degrees F and no wind. So we retired to our camp, two people to a tent. And yes, I did say tent...

We began to acclimate to this new environment, checking out our gear, planning and rehearsing meteorite search techniques, learning to keep hydrated (due to the extremely low humidity—Antarctica is the driest place on Earth) and the proper way to use the bathroom facilities (a whole lecture in itself), and adjusting to 24 hours a day of daylight. Cameras seemed to work fine; we used different techniques to keep the batteries warm.

Other things we often take for granted are fogging up glasses and cameras (they ice up, not fog), protecting the skin not only from cold but the sunlight reflecting off of the snow and ice, and simply learning to be patient.

It didn't take long for this continent to show just a little of its brute force, for Katabatic winds of 40 miles per hour with gusts up to 80 miles per hour kicked in during a practice gear and meteorite hunt on the blue ice at Patriot Hills. This cold wind reminded me of beach sand blasting my face during hurricanes Frances and Jeanne, as the snow and ice impacted my face. And there is nothing you can do but be patient and wait it out; even the well-seasoned Canadian Twin Otter plane pilots try not to fly in such harsh conditions. But it gave my ankle a little longer to heal.

After the Katabatics died down, we were on our way south. We stopped to refuel the Twin Otter at the Thiel Mountains (an area at approximately 85 degrees S latitude ALE uses as a fuel cache and as a base camp for our activities) and then flew to the South Pole Station, where the temperature was a balmy -29 degrees F. There is a ceremonial pole as well as the actual geographic South Pole at 90 degrees S latitude. The National Science Foundation has a large permanent facil-



Dr. Mike outside his tent, which kept the sub-teen temperatures from nipping at his toes at night

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Eastbay Astronomical Society

Eighty-first Anniversary Dinner

Sunday, March 13, 2005

Astronomy Hall of Chabot Space & Science Center

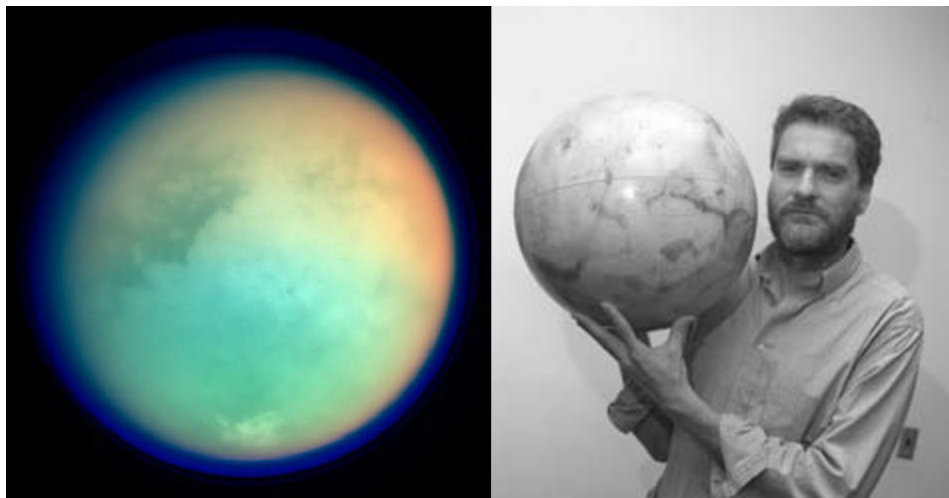
10000 Skyline Boulevard, Oakland

The doors will open at 5:45 pm, with Dinner at 6:45 pm.

Awards presentation, door prizes and lecture about 8:00 p.m.

Exploring Titan!

Dr. Chris McKay



NASA's *Cassini-Huygens* probe entered Saturn's orbit in June of 2004 after a long seven year voyage, which included four gravity-assists. Since then, it has been studying and transmitting data and images about the famous ringed gas giant and its thirty moons to us, and we have learned many new and amazing things from the encounter. By the time we hold our Annual Awards Dinner, the Huygens-half of the Cassini-Huygens probe will have been sent to, and landed on, Saturn's largest moon, Titan—the second largest moon in the solar system (Jupiter's Gany-mede is the largest). NASA Astrobiologist, Chris McKay, will be among the first to analyze the data, and he will tell us the very latest of what has been learned from this historic mission.

Titan is the largest moon of the planet Saturn, and is the only moon in the solar system with a substantial atmosphere. It is mostly made of nitrogen and has a pressure one and a half times greater than that of the Earth at sea level. In these respects, Titan's atmosphere makes it the Earth's closest twin.

When Dr. McKay was in school, he studied physics, and from physics gravitated toward astrophysics. In 1976 he became a first year graduate student in the department of Astrogeophysics at the University of Colorado, Boulder. That same year Viking landed on Mars. The results were most mysterious to Dr. McKay. *Here was a planet with all the elements needed to support life (CO₂, H₂O, N₂) present in its atmosphere, with evidence of liquid water in the past and yet there was no sign of life. It seems like Mars had 'the lights on but nobody home.'* He slowly became more and more interested in life and how it originates, survives and changes a planet. In 1980 Dr. McKay applied to be a NASA graduate student Planetary Biology Summer Intern. He was accepted and sent to NASA Ames working with Jim Pollack. While at Ames he met Imre Friedmann of Florida State University and became involved in microbiological work in the dry valleys of Antarctica. *I became more and more interested in life and planets and continue to this day to conduct research in this area with a special focus on Mars and with many trips to the Antarctic.*



Dinner will be catered by **Jessica Lasky** featuring tuscan style crispy golden chicken roasted in the under bricks, warm farfalle pasta with caramelized onions, walnuts, and arugula, caramelized vegetables with feta and oregano dressing, organic spinach salad with grilled apples, warm brie, and sherry vinaigrette, fresh fruit salad and cookies, crusty breads and rolls.

Cost per person is \$33.00. Mail your checks or money orders, payable to the EAS, as soon as possible with the form below, or bring it with you to the next meeting, or give it to any club officer at Chabot some Friday or Saturday evening. Get your reservation in soon to guarantee a seat. *We must give the caterer a final count by March 7th.*

Questions?
Contact EAS Treasurer Don Stone at
(707) 938-1667
or email him at
ddcstone@earthlink.net

Eastbay Astronomical Society Annual Awards Dinner
Sunday, March 13, 2005
Registration Form

Number of Attendees: _____

Name(s): _____

Address: _____

City, State, Zip: _____

Phone: (____) _____ Email: _____

Total Amount (\$33 per attendee): _____

Please send this form with your check or money order (no cash, please) to:

EAS Treasurer
19047 Robinson Road
Sonoma, California 95476-5517

Editor's News 'n Views



Howdy, Astro Fans! Wow! Have you seen the new *Mirror Mirror* exhibit at Chabot, yet? I just saw it, and it's very cool, indeed. Especially: <cue reverb> THE INFINITIY CUBE CUBE CUBE CUBE....

Warning: if you look into it, it will look into <cue reverb> YOU YOU

YOU YOU... Anyways, the whole exhibit is highly interactive, with lots of strings to pull, balls to roll, knobs to turn, and even a camera to act like a goofball in front of (you won't be able to stop yourself—you'll see). It's a great replacement for *Dragon Skies*, which has gone on to tour the rest of the nation (Chabot developed it, so, of course, we got to see it first—how nice!)

In other news: please notice the full page ad in this newsletter for our **EAS Annual Awards Dinner**—sorry we're announcing it quite so late, but there was a problem getting our usual caterer which we could not anticipate, so, we couldn't really advertise the event until we had that settled. We've got one, now, but we're in a bit of a time crunch, so if you could get your reservations in ASAP, we organizers would be most grateful. This year, you can do it instantly from our club's website at www.eastbayastro.org. We need at least 50 paying attendees to keep from losing \$\$ on the deal, and we could actually pull that off this year, thanks to the magnetic star-power of our highly popular NASA speaker, **Dr. Chris McKay**—astrobiologist extraordinaire, who will speak on the hottest topic on the (our) planet right now: the *Cassini-Huygens* mission to Saturn and Saturn's moon, Titan!!! Good job, Dave! (**Dave Rodrigues**, our intrepid Events Coordinator, pulled us in one of the really big fish this year.)

We now know the *exact* location of the Chabot Space & Science Center here on Earth, probably better than most other locations on the entire planet (right down to a couple of *millimeters*, thanks to the uncompromising skill and enthusiastic dedication of professional surveyor **Fred Johnson**, who donated his time over a period of two years, going round and round the entire Bay Area region, from Mt Tam to Mt. Diablo, and many other locations, to help super-verify this spot. You'll remember the new compass rose, installed in Wightman Plaza by **Terry Galloway** a few months ago? Well, with Fred's direction, Terry installed at the very center of the rose, a beautiful bronze plaque that reads:

Chabot Space & Science Center
WIGHTMAN
LAT. N.37° 49' 09"3277
LONG. W.122° 10'54"1379
NAD83 △ CORS96
470.39 Meters
1543.3 Feet
Above Mean
Sea Level
2004



(see photo). Fred used to be with the USGS, but is now working for National Geographic. Assisting Fred in this task was **Carter Roberts** and **Terry Galloway**. Thanks guys!

Let's see, what else is happening? Oh yes—here's a few items that are just now popping up on the radar screen:

1) The time's a comin' for this year's **March Messier Marathon**. The best nights to try are from Tuesday March 8—Saturday, March 12, with Thursday March 10th (new moon) as *the* best night to try for all 110 Messier Catalog objects. A good book on how to make a go of it is Don Machholz' *The Observing Guide to the Messier Marathon: A Handbook and Atlas* (available from Amazon.com for \$19.80)

2) Also, **Astronomy Day on Saturday, April 16**. A handful of the more active amongst us are planning to grab our daytime astro gear to show the public at the Oakland Zoo and (hopefully) Jack London Square what a great hobby astronomy makes. I'm telling' ya, it's a fun, easy, and worthwhile activity—give it a try this year! We can always use an extra hand or two—whether you've got your own equipment or not. Also, remember: you can use the volunteer work as an excuse to actually get more and better equipment: “But honey, I just *have* to get this Coronado SolarMax 70 (with optional Sol Ranger sun finder) so the *children* will be able to see prominences on the Sun!” Yeah, *right*.

Our former *Refractor* editor, **Ellis Myers** sent in this note: *EAS member Jim Scala was included in [the] Feb. 5 Contra Costa Times' feature section Where We Live: Lafayette. There is a large color picture of him in his observatory. Very cool—thanks, Ellis!*

And finally, here's a note from **Bob McGown & Miles Paul**, authors of *Galaxy Groups and Clusters Observing Guide*.

Dear Amateurs,

To those of you who have partially finished the Galaxy Groups and Clusters observing program (sponsored by the Astronomical League) and have completed at least one of the four categories - Hickson, Abell, Galaxy Trios, and Galaxy Groups - we are now giving out certificates in each of the four categories. You will be recognized at your club meeting and your name will go on the website as award winner in the category you have completed. This is a challenging program and we feel it is important to recognize those who have completed any of the compact galaxy group categories. However, to get the GGC pin you still have to complete the required 120 (total) in all four categories. Happy Viewing!

That's it for now. See you – IN THE FUTURE! ☆

Spare Shots



▲ Carter's picture of the moon over Lick Observatory, Mt. Hamilton

▶ Ever see that first Superman movie, where the criminals from the planet Krypton are banished to the Phantom Zone?

▼ The inside of the Infinity Cube (C. Roberts)



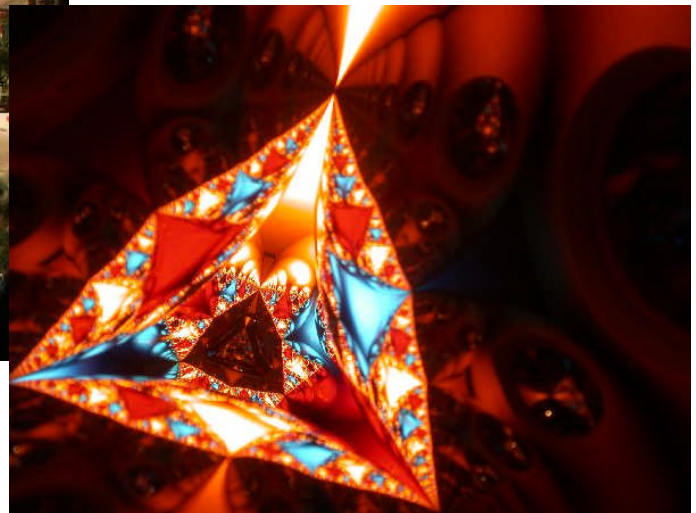
▼ Movable mirrors make amazing, interactive sculpture of light patterns



▼ An infinite series of reflections of reflections using spheres
That's it for this month! ☆



▶ Big slug on sidewalk to Wightman Plaza



Antarctica

Continued from Page 2

ity there and we were greeted by the South Pole Station's lead scientist and the station manager who gave us a tour and overview. What a mental rush to put your body at the Earth's South Pole! The Ceremonial Pole looks like a Barber Pole with a highly-reflective sphere at the top of the pole. The Ceremonial Pole is surrounded with the flags of the nations which are a part of the Antarctic Treaty.

Back aboard the Twin Otter, we flew back to our meteorite base camp at the Thiel Mountains. The plan was to fly out to Brazitis Nunatak, part of the Patuxent Range, the following day to spend the day on the Nunatak's blue ice to search for Antarctic meteorites. But yet weather dealt us another nasty turn: total overcast, blowing snow and a white out. Remember this is during Antarctica's warm winter months. Now we were provided the opportunity to spend time learning the fine art of camping in such conditions, ice toilets, and starting to plan food rationing. I then recalled that some of the early Antarctic explorers ate their horses...

Finally the weather broke and we flew off to Brazitis Nunatak, with my ankle in tow. I was going to crawl across that blue if necessary. After landing our team fanned out and began a systematic search. One hour into the search, we were motioned over to the team member farthest from the Nunatak for a look at a potential specimen. I hobbled on up and my jaw just went slack. There was on the ice what looked like a very rare meteorite: a Diogenite or a SNC (Martian meteorite; *One of a small number of achondritic meteorites believed to have originated on Mars. The letters SNC [pronounced `snick'] stand for the three main classes: shergottites, nakhlites and chassignites – Ed.*). There appeared to be a leading edge of a greenish fusion crust on this approximately 30 mm by 25 mm by 5 mm specimen. The sample was carefully documented, including its location via GPS.

A little about these two classes of meteorites. Both are Stony meteorites (based on the basic classification of meteorites into irons, stones and stony irons).

Diogenites are a class of stone [achondrites](#) (HED; *howardite, eucrite, and diogenite – Ed.*) mostly composed of magnesium-rich [orthopyroxene](#), with minor amounts of [olivine](#) and [plagioclase](#). The pyroxene in most diogenites is usually quite coarse-grained, which suggests an origin for the diogenites in magma chambers within the deeper regions of asteroid crusts, specifically the asteroid Vesta. Diogenites are intrusive igneous rocks similar to terrestrial plutonic rocks, which cooled slowly allowing the pyroxene to form sizeable crystals.

Shergottites are a class of stone achondrites (SNC); Martian meteorites. The Martian meteorites, often referred to as SNCs (from the original three groups of Martian meteorites) are igneous in nature, and some are similar in appearance to the Diogenites. They resemble both the mineralogy and chemistry of terrestrial rocks form in a volatile-rich and oxidizing environment. Shergottites (one of the major Martian meteorite classifications and the "S" in SNC), especially a sample referred to as Los Angeles 001, can exhibit a greenish appearance.

After work on the suspect specimen, we looked at numerous terrestrial samples from the Nunatak moraine to compare with

the specimen. At this point, with our in-situ observations, I would guess it is 50-50 that it is a meteorite. More analysis will be required.

Our search was cut short due to the weather. We headed back to the Thiels to refuel, and then back to Patriot Hills where another Katabatic wind started to blow. The wind relented, the Ilyushin flew in and unloaded more fuel, and, as we were prepared to board to fly back to Punta Arenas, the wind picked back up again. So another 28 hour delay...

There are basics we all take for granted, like easily being able to go to the toilet at 3 AM, taking a shower, sunsets, or a cup of freshly brewed coffee (well, a basic for me!). But for me all-in-all this was truly one incredible and unforgettable adventure. And besides, how many people get the opportunity to use an ice toilet!

Still Looking Up!

Mike

Mike D. Reynolds, Ph.D.



This year's club officers

Here are the club officers for 2005. We have two new officers: **Celeste Burrows**, a staff CSSC member with a strong interest in observational astronomy, and **Gerald McKeegan**, a Telescope Operator trainee and amateur astronomer. Thanks to both of them for becoming involved! And, of course, thanks to the rest of the Board Members for their continued involvement. ★

President: Carter Roberts

Vice President: Phil Crabbe II

Secretary: Linda Lazzereti

Treasurer: Don Stone

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Eric Campbell

Alan R. Fisher

Terry R. Galloway

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Eastbay Astronomical Society

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

February 2005
RETURN SERVICE REQUESTED

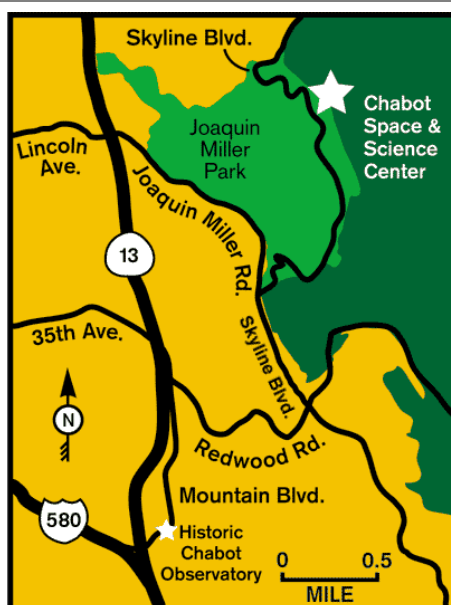
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President: Carter Roberts (510) 524-2146
Treasurer: Don Stone (707) 938-1667
Secretary: Linda Lazzaretti (510) 633-2488

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 March 2005 issue is February 16, 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

- Feb 10 EAS Board Meeting, Chabot, Soda Board Rm, 7:30pm
- 19 EAS General Meeting at Chabot, Soda Bd Rm, 7:30pm
- Mar 10 EAS Board Meeting, Chabot, Soda Board Rm, 7:30pm
- 13 EAS Annual Awards Dinner, Planetary Landscapes Hall, Dellums Building, doors open at 5:45pm details inside this issue.

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/>