



The Refractor

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

Volume 78
Number 6
January 2002

The Great Pluto Debate

by Robert Naeye
Astronomical Society
of the Pacific

Saturday, January 5, 2002

Biology Lab, 1st Floor, Spees Bldg
Chabot Space & Science Center, Oakland

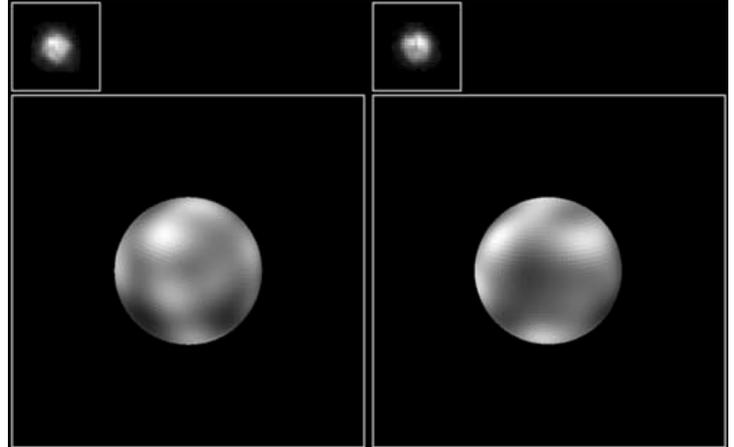
- Meeting – 7:30 pm
- Lecture – 8:00 pm

For a cold little planet on the outskirts of the solar system, Pluto raises a firestorm of controversy. Neither a rocky terrestrial planet nor a gas giant, Pluto was unable to find comfortable niche in the grand scheme of the solar system. But since 1992, astronomers have found more than 400 similar bodies orbiting the Sun beyond Neptune in the so-called Kuiper Belt. Some of the newly-discovered worlds have diameters half that of Pluto. Given these new discoveries, should Pluto still be called a “major planet,” or is it simply the largest known Kuiper Belt object? Robert’s talk will present both sides of the Pluto debate in a fair and balanced manner, and it will also present some of the latest findings of planets outside the solar system (which have sparked another debate about the upper end of the planet scale). Robert hopes that a spirited discussion will follow his talk.



Robert Naeye is the editor of Mercury magazine, which is published in San Francisco by the Astronomical Society of the Pacific. Robert previously worked as an editor for Astronomy magazine for more than 5 years. He has also worked on the editorial staffs of Sky & Telescope and Discover magazines. He is an amateur astronomer and the author of two books. His first book, Through the Eyes of Hubble: The Birth,

Life, and Violent Death of Stars was published in 1997. He will stay after his talk to answer questions and sign copies of his second book, Signals from Space: The Chandra X-ray Observatory, which was published in 2000 ★



Pluto Credit: Alan Stern (Southwest Research Institute), Marc Buie (Lowell Obsy), NASA and ESA Hubble Space Telescope

The surface of Pluto is resolved in these NASA HST photos, taken with the European Space Agency's (ESA) Faint Object Camera (FOC) aboard Hubble.

Discovered in 1930, Pluto has always appeared as nothing more than a dot of light in even the largest earth-based telescopes because Pluto's disk is much smaller than can be resolved from beneath the Earth's turbulent atmosphere. Pluto is 2/3 the size of Earth's Moon but 1,200 times farther away. Viewing surface detail is as difficult as trying to read the printing on a golf ball located thirty-three miles away!

Hubble imaged nearly the entire surface of Pluto, as it rotated through its 6.4-day period, in late June and early July 1994. These images, which were made in blue light, show that Pluto is an unusually complex object. ★

DINNER WITH THE SPEAKER

5:30 PM

Saturday, Jan 5, 2002

PEARL OF SIAM RESTAURANT

5498 College Ave.

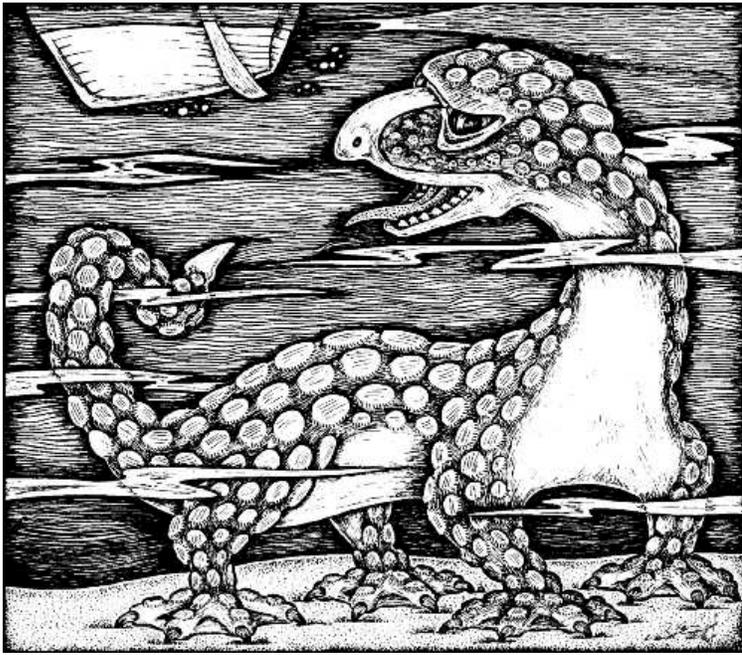
Oakland

(510) 420-8600

Please call Betty Neall at
(510) 533-2394 by Friday,
January 4, 2002 to
confirm your place

Inside This Issue:

Cetus and Mira	2
2001 Member List	3
Editor's News/Views	4
Upcoming at Chabot	4
New Comet Coming?	4
Fund Redirection	4
Save the Pendulum!	5



Cetus, the Sea Monster, and Mira, the Wonderful

By Ellis Myers

Ranging from Aquarius on the west to Taurus on the east and lying south of Pisces and Aries, the sea monster Cetus is one of the largest of the constellations.

There are no bright stars in Cetus. Menkar and Deneb Kaitos al Janubiyy are of second magnitude and there are just 20 other naked-eye stars down to magnitude 4.9. Of these the most interesting is certainly Mira, Omicron Ceti. This was the first star to be clearly recognized as a variable star, and it lends its name to an entire class of long-period variables. For about six months, this star shines at a magnitude of between 3 and 4; then it dims to the other side of visibility at magnitude 9. As it slowly pulsates in brightness, so it pulsates in temperature and thus in color. At its maximum the star is relatively cool and large, 400 times the diameter of the Sun. In 1779 Mira became a star of first magnitude, for a while rivaling Aldebaran in the winter sky. Its peak brightness is 3.4, on average, and it should next reach that peak on August 2, 2002, although it could reach that maximum somewhat before or after the predicted date, and may remain at that level for some time. Mira (which means “Wonder” or “Miracle” star) is 220 light-years away from Earth. Closer is Tau Ceti, less than 12 light-years away. Only Alpha Centauri, Sirius and Procyon are both closer and brighter than this 3.5 magnitude star.

In Greek mythology Cetus is the beast that was sent by the Sea Nymphs to ravage the coast of Ethiopia in vengeance for Queen Cassiopeia’s boast of her superior beauty. Often referred to as the Whale, this creature is usually depicted not as a whale at all, but as some beast more like a sea serpent. In the sky, his body resembles a dolphin, with a forked tail branching from Deneb (Eta) out to the stars Deneb Kaitos al Shamaliyy

(Iota) and Deneb Kaitos al Janubiyy (Beta), the Arabic “whale’s tail to the north” and “whale’s tail to the south”, respectively. But the contemporary author H. A. Rey draws a constellation diagram of Cetus that turns the classic conception around. He puts Menkar (Alpha), the Arabic nose, and the other “head” stars in the northeast of the constellation as the tail of his whale. The two Denebs make up the head of Rey’s design as the giant cetacean dives under Pisces and Pegasus.

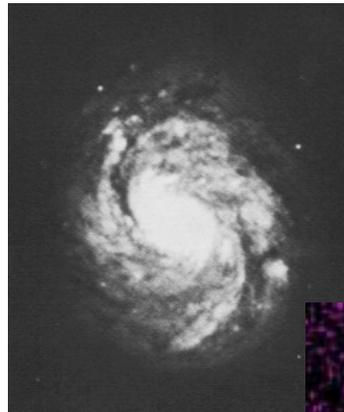
Of a number of double and multiple stars in the constellation, only one (other than Mira, which is a double with a faint optical triplet), Gamma Ceti, is brighter than magnitude 5. With enough magnification, this pair, 2.7 seconds apart, can be resolved with a small telescope. The colors are white and yellow for the 3.5 and 7.3 magnitude couple.

Midway between Mira and Menkar is M77, a Messier spiral galaxy about one degree southeast of Delta Ceti. This “Seyfert” galaxy has a nucleus brighter than normal. It is thought that there may be a black hole at the center and that a great amount of radiation is released as matter is torn apart as it joins the rapidly rotating accretion disk and is sucked into the black hole’s gravity well. M77, at 9th magnitude and occupying an area about 6' x 7' in size, should be visible with

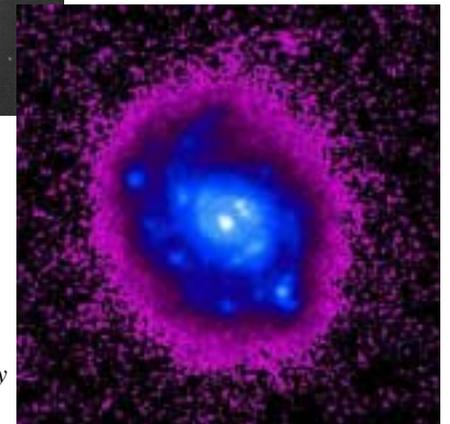
binoculars or a small telescope.

★

Discovered 1780 by Pierre Méchain. ~60M light years distant
This magnificent galaxy is one of the biggest galaxies in Messier's catalog, its bright part measuring about 120,000 light years, but its faint extensions go out to nearly



170,000 light years. Its appearance is that of a magnificent spiral with broad structured arms, which in the inner region show a quite young stellar population, but more away from the center, are dominated by a smooth yellowish older stellar population.



When photographed in the ultraviolet (UV), as shown above in false color, the galaxy sports an ultraviolet halo - shown as violet in the photograph. The blue spiral structure closer to the picture's center indicates normal ultraviolet emission from bright young stars that have recently formed there. Astronomers now hypothesize that the outer glow arises from UV light emitted from the galaxy's active center and reflected to us from clouds of gas and dust. These same gas and dust clouds obscure the active center of this Seyfert galaxy - where an ultramassive black hole is thought to live. (Excerpted from NASA [<http://apod.gsfc.nasa.gov/apod/ap960910.html>] and SEDS websites [<http://www.tlc.ousd.k12.ca.us/stream>])

Membership List as of December, 2001

Anderson, Bruce & Emma - Pleasant Hill, CA
 Anderson, Carlo - Kensington, CA
Anderson, David - Fremont, CA
 Arthur, Daniel - Oakland, CA
 Backer, Frederick - Oakland, CA
 Bailey, Paula - Fremont, CA
 Banchemo, Paul - Oakland, CA
 Barosso, Dave - Linden, CA
 Berger, Doug - San Leandro, CA
 Betancourt, Harry - Oakland, CA
 Blasier, Ralph - Ann Arbor, MI
Bosch, Warren, Jan, Brandon - Concord, CA
 Bransfield, Jay & Liz - Piedmont, CA
Brennan, Alan - Moss Beach, CA
Brennan, Anne & Andrew - Castro Vly, CA
Brockett, Tim - Los Angeles, CA
 Brugge, E. Homer - Oakland, CA
 Brylawski, Robert - Oakland, CA
Burrows, Celeste - Emeryville, CA
 Campbell, Richard - Walnut Creek, CA
Caskey, Rick - Oakland, CA
Chung, Glen - Alameda, CA
Clancy, John - Moraga, CA
 Click, Charles - Pleasant Hill, CA
Conhaim, Joe - Oakland, CA
Cox, Nancy - San Francisco, CA
 Crabbe, Phil - Oakland, CA
 Cummings, John - Sacramento, CA
 Dooley, Douglas - Castro Valley, CA
 Dyke, Debbie - Pleasanton, CA
 Edelson, Daniel & Barbara - Oakland, CA
Epstein, Lewis - San Francisco, CA
 Estill, Tom - Livermore, CA
Ewing, George - Orinda, CA
Falla, Danny - San Diego, CA
 Feder, Yale - Berkeley, CA
 Fehskens-Russ, David & Eileen - Moraga, CA
 Fields, Lucy - Berkeley, CA
Fisher, Alan - Oakland, CA
Freitas, Nancy - Hayward, CA
 Friday, John - El Cerrito, CA
 Frohardt, Allen - San Jose, CA
 Fung, Darlene - Oakland, CA
 Gaposchkin, Peter - Berkeley, CA
 Garfinkle, Robert - Union City, CA
 Gibson, James - Tujunga, CA
 Gies, John - Berkeley, CA
 Gingrich, Mark - San Leandro, CA
Goddard, Robert - Oakland, CA
 Gorringer, Richard - Hayward, CA
 Gorski, Alan - Long Beach, CA
Gottschalk, Gert - Fremont, CA
 Gould, Alan - Berkeley, CA
Grau, Kim - Berkeley, CA
 Gross, Robert - Oakland, CA
 Halberg, Maggie - Danville, CA
 Hanley, Michael - Berkeley, CA

Heppler, Winifred - Berkeley, CA
 Higgins, Leonard - Napa, CA
 Hoy, Paul - Oakland, CA
 Johnson, Rudin - Berkeley, CA
 Johnston, George - Hayward, CA
 Jones, Jane H. & Morris - San Rafael, CA
Jose, Edward - Lafayette, CA
 Jung, Conrad - Oakland, CA
Katler, Ernest - Kensington, CA
 Kiler, Walt - Castro Valley, CA
 Komatsu, Toshikazu - Berkeley, CA
Landon, Kenneth - El Cerrito, CA
Langren, Roberta - Alameda, CA
Lazzeretti, Larry - Richmond, CA
 Lazzeretti, Linda - San Leandro, CA
 Leahy, John - Danville, CA
 Leonard, Arthur - Blaine, WA
Liu, Joseph - Salinas, CA
 Lum, Ken - San Carlos, CA
 Mackin, Terrence - Pleasanton, CA
Maloon, Michael - Alamo, CA
 Mangrum, Howard - Oakland, CA
Marshall, Amelia - Oakland, CA
 Martin, Patrick - Albany, CA
Martin, Thomas - Placerville, CA
Martinez, Christopher - Oakland, CA
 Maski, Lilyan & Rollen - Alameda, CA
 Massie, Steven - Louisville, CO
 McKeegan, Gerald - Walnut Creek, CA
 Mehl, Carter - Albany, CA
Merriam, Marshal - Antioch, CA
 Meuris, Jean - Berkeley, CA
Morris, Tom - Sunol, CA
 Murray, David - Alameda, CA
 Myers, Ellis - Moraga, CA
 Nelson, Edwin - Alameda, CA
 Noriega, Leonard - Oakland, CA
Nowell, Mark - San Leandro, CA
Nye, Gary - Orinda, CA
 Oslund, Kenny - Castro Valley, CA
 Peck, Eileen - Kensington, CA
 Peterson, Donald - Oakland, CA
 Pinschmidt, Penny - Palo Alto, CA
Poulsen, Don - Brentwood, CA
 Predovic, Louise - Alameda, CA
Predovic, Mike - Alameda, CA
 Preston, Jeannie & Jack - Oakland, CA
 Prickett, Noreen & Bruce - Fremont, CA
 Qin, Josh & Jessie - Castro Valley, CA
Quartemont, Edward - Fairfield, CA
 Rasmussen, Maybelle - Hayward, CA
 Ray, Shela - Berkeley, CA
Reinfeld, Jay - Aventura, FL
 Renner, Richard - Alameda, CA
 Renslo, Adam - Oakland, CA
Ries, Harry - Oakland, CA
Ritter, Raymond - Oakland, CA
 Roberts, Carter - Berkeley, CA
 Robinson, Michael - San Lorenzo, CA
Roche, Alan - Oakland, CA
 Rodrigues, David - San Leandro, CA

Rojas, Heraldo - San Bruno, CA
Ross, Tinka - San Rafael, CA
 Roush, George - Concord, CA
Rudloff, Dick - Alameda, CA
 Saito, Don - Oakland, CA
 Sarrica, Richard - Livermore, CA
 Sauve, Vincent - Oakland, CA
 Scala, James - Lafayette, CA
 Schalck, Robert - Geyserville, CA
Scherrer, Deborah & Philip - Castro Vly, CA
Schwartz, Guy - Moraga, CA
Seaborg, David - Walnut Creek, CA
Shaw, Lance - Pinole, CA
Sheridan, William - Oakland, CA
 Shryock, Howard - Oakland, CA
 Simmons, Rodney - Oakland, CA
Singman, William - Oakland, CA
 Skelly, Bruce & Harriet - Castro Valley, CA
Skelly, Sam - Oakland, CA
Smith, Billy - Hayward, CA
 Smith, Theodore - Concord, CA
 Solar, Jim - Alameda, CA
 Sperske, Dineane - Oxnard, CA
Stepka, William - San Francisco, CA
Stern, Al & Rita - San Francisco, CA
Stewart, John - El Cerrito, CA
 Stoddard, Paul - San Lorenzo, CA
Stone, Dean - Sonoma, CA
Stone, Don - Sonoma, CA
 Streitwieser, Andrew - Berkeley, CA
Swagerty, Ken - El Sobrante, CA
Tauber, Ronald - Berkeley, CA
 Thein, Mark - Union City, CA
Trafalchik, Sergei - Novato, CA
Travis, Julius - Berkeley, CA
Treganowen, David - Larkspur, CA
 Trost, Carl - San Francisco, CA
 Uribe, Dawn Yoshimura - Oakland, CA
Veio, Frederick - Clearlake Park, CA
Waidl, Joseph - San Jose, CA
 Wallace, Vernon - Santa Cruz, CA
 Walters, David - Castro Valley, CA
Wasiluk, Elizabeth - Martinsburg, WV
Weisser, Victor - Oakland, CA
 Werner, Paul - Richmond, CA
Westfall, Elizabeth & John - Antioch, CA
Wiesner, John - Castro Valley, CA
 Williams, Dorothy - Fremont, CA
 Zurakowski, Paul - Livermore, CA

Total Year Ending 2001:	166
Non-renewals:	- 68
Total Year Beginning 2002:	98

(Names in italic have not renewed as of this writing – 12/27/2001.)

(This is a “partial info” list – a list with addresses, phone numbers, and email addresses will be coming in a future issue.)

Editor's News 'n Views

Upcoming Events at Chabot

By Denni Medlock

Ho, ho, ho! Merry Solstice! Hope this holiday season is finding you happy, healthy, and that *somebody* has given you lots of toys for *whatever* reason! (I sometimes long for those non-PC days when you could just say 'Christmas,' or 'Santa,' or whatever. Sure, some people got their toes stepped on, but at least it didn't sound quite so, so *generic*. Oh, well; that's the way the big blue marble rolls these days, I reckon.) So? How *did* you fare? Any new zirconium-studded eyepieces, or computer-controlled tripod feet stabilizers? I'm dying to see one of those I³ image intensifier eyepieces. If you got one, or *anything* particularly cool, think about bringing it to a club meeting in the not-too-distant future and do a show-and-tell. It would be a fun thing to do, and that's a big part of what our club is supposed to be about: FUN.

Speaking of which: our club membership is a little bit down, right now. One thing I'll bet we could do to boost the numbers some – offer free classes on how to operate those \$100 computer-controlled Meades, which have been selling like hotcakes from Costco. Oooh! I just had an idea: we could arrange with Costco to handle support for their inevitable customer telescope questions in exchange for advertising. It *sounds* like a good idea. Of course, we would have to have volunteers who were knowledgeable with those Meades, plus, telescopes in general, and the sky. Oops! Sorry about that. I said the "V" word, didn't I? The curse of many (but not *all*) clubs throughout the land – not enough volunteers. I suppose before we go reaching for the stars, we need to get more of our member's off their lazy...ahh, that is to say, we need to *motivate* our members to become *more involved* with the club's activities. Yeah, that's the ticket. I was going to say "lazy butts," but thought better of it. ;-)

And speaking of fun club activities, we had a lot of educational fun at our holiday potluck club meeting; munching on some great dishes and pounding down nog after nog. Carter showed his slides of his and my trip to Australia (to see the 2001 Leonid meteor storm); Carl Trost showed TWO slides – a nice, recent one of Rachel, and another of a Blue Moon (a picture of the moon with a blue filter on it); David Seaborg gave an interesting talk about the trip he and his wife took to Australia to see the Leonids, and also about some of the animal life they encountered there; and I showed my vacation video of Carter's and my trip to Australia; and finally, Lew Epstein gave a talk about the San Francisco Academy of Science' renovation plans which *don't* include keeping the Foucault (pronounced foo-coe) pendulum. Look for the writeup on the next page for more info on it, and what you can do to help save the pendulum from the (trash) pit.

And that's about it from my end of things. As always, if you've got an opinion or announcement you'd like to make, feel free to let me know; I'm always looking for material to put in this, *your* newsletter.

And I can still say unabashedly: Have a Happy (and *safe*) New Year!!!!!!!!!!!!!! ☆

Nancy E. Clanton, from the International Dark Sky Association & the International Association of Lighting Designers will be our guest speaker on Jan 17, 2002 at 7:30 pm in the Tien MegaDome Theater as part of the Distinguished Lecturer Series.

"Assessing California's Outdoor Lighting: Star Quality & Ample Quantity" will take a look at current lighting regulations & design in California & how they affect both the quality of our lives & the level of light pollution. If you are interested in what is being done to enhance the dark sky environment crucial to the pursuit of astronomy, please join us!

Tickets are \$5 & can be purchased at TicketWeb.com, or by calling 510-336-7373. Tickets can also be purchased the night of the lecture.

Second:

Chabot Space & Science Center is offering a six-week Astronomy Class designed especially for adults who are curious about the universe surrounding them & want to learn more! The class will run February 5 - March 12, 2002, 7:30pm - 9:30 pm. on Tuesday evenings.

This non-mathematical class will cover constellations, the Solar System, Stars, Galaxies & the Universe. Historical conceptions & modern research will also be discussed. This course will utilize the Ask Jeeves Planetarium & Observatories.

\$55 members, \$65 non-members. Registration can be done by mailing a check to CSSC, c/o D. Medlock, 10000 Skyline Blvd. Oakland, CA 94619 or by credit card by calling 510-336-7368. Space is limited! ☆

Yo, Astro folk:

A message (recently) posted on Usenet's sci.astro.amateur newsgroup reports that Comet 2001 Q4 NEAT, discovered a few months ago by one of the automated solar-system "debris sweepers," may be a whopper: The preliminary orbit shows it approaching within 30 million miles from Earth in May 2004. And, if it behaves like a "normal" comet, is predicted to be magnitude *zero*!

More info should be forthcoming soon.

Okay, folks, you've got 2+ years to get your photo/video gear ready....

Regards, Mark (Gingrich)

EAS Board proposal to redirect funds

At the last Board meeting, the Board decided to propose to the club a redirection of funds, formerly targeted for a video projector (which we don't really need any more due to the plethora of such equipment at Chabot). Instead, we'd like to get an eyepiece for Rachel – a \$600 2-inch, 31mm Type 5 Nagler (nicknamed 'the Pineapple') from TeleVue. Yea, or nay?

SAVE THE MORRISON PLANETARIUM FOUCAULT PENDULUM

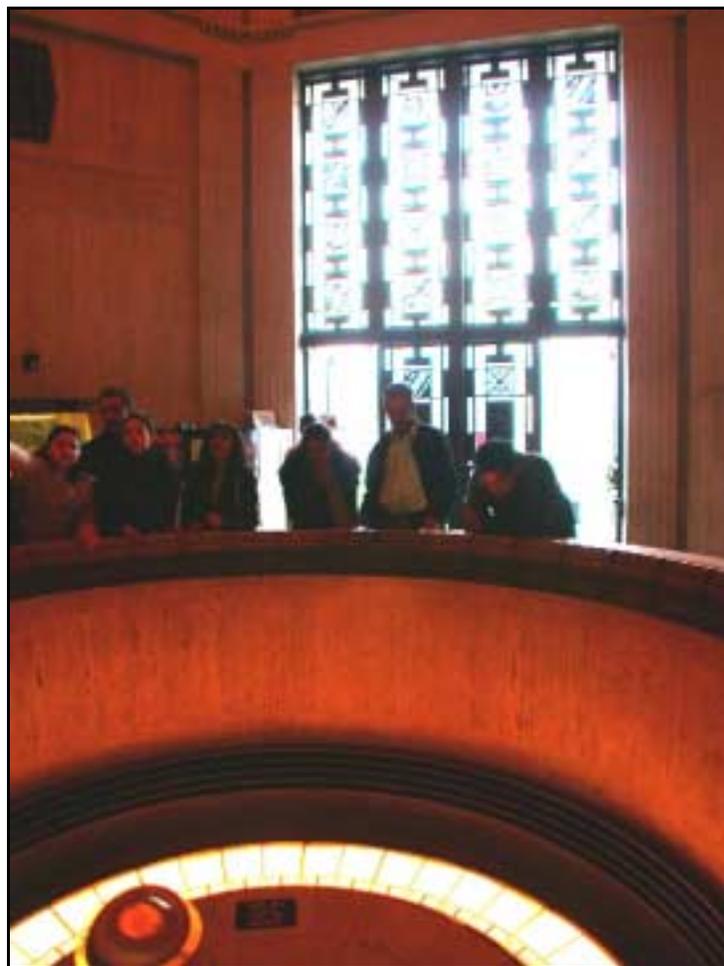
The California Academy of Sciences, in Golden Gate Park, intends to discard the Foucault Pendulum Exhibit for the following reasons:

1. The public does not understand what the Pendulum is intended to demonstrate.
2. The public does not understand how the Foucault Pendulum works.
3. The Pendulum does not connect to natural science. Natural science = life science.
4. The academy plans to focus its educational mission on life science, not physical science.
5. The Pendulum is only a “scientific curiosity.” It does not fit into anything

A point-by-point refutation of the Academy’s “reasoning”:

1. Yes they do. There’s a plaque on it that *says* what it’s supposed to demonstrate. The Pendulum demonstrates that the earth turns on its polar axis, but it’s much more than just that simple fact. It shows that through experimentation, alone, you can prove the Earth turns even if you couldn’t see the sky or go into space to watch it.
2. Exactly how the Pendulum works is not an easy thing to teach. But then again, neither is the exact biochemical reactions that make leafy greens from sunlight. It can be explained to any half-serious high school student. It’s a mystery, a puzzle that intrigues the curious mind; and isn’t that a big part of what science museums are supposed to do?
3. In fact, that the Earth’s spin on its axis is essential to the existing biological systems over the entire globe, affecting everything from the changing seasons, wind, weather and ocean currents and tides, to the average air temperature and the sleep patterns of different animals.
4. Why? What’s wrong with the physical sciences? Does that mean there’s going to be nothing on astronomy at all? After all: what do the stars have to do with plants and animals?
5. The Pendulum demonstrates the Earth’s rotation, which has a lot to do with practically every aspect of life here on Earth.

Strangely enough, the Academy of Sciences website even has a web page devoted to the Foucault Pendulum that explains all of these things and more(!) <http://www.calacademy.org/products/pendulum/>



A beautiful and elegant demonstration of science, this is the Foucault Pendulum at Griffith Observatory in Los Angeles, which has attracted and intrigued millions of visitors both young and old for decades.

What you can do to save the Foucault Pendulum

Write a letter in your own words answering the objections raised against the presence of the Pendulum exhibit. Describe how it has affected you, and how it’s affected others you’ve seen watching it. Be specific about who you’ve seen; whether they were little kids, students, adults, senior citizens, amateur astronomers, biologists, etc. Send your letters to:

Dr. Terry Gosliner, Provost
and
Dr. Patrick Kocioler, Director
The California Academy of Sciences
Golden Gate Park
San Francisco, CA 94118

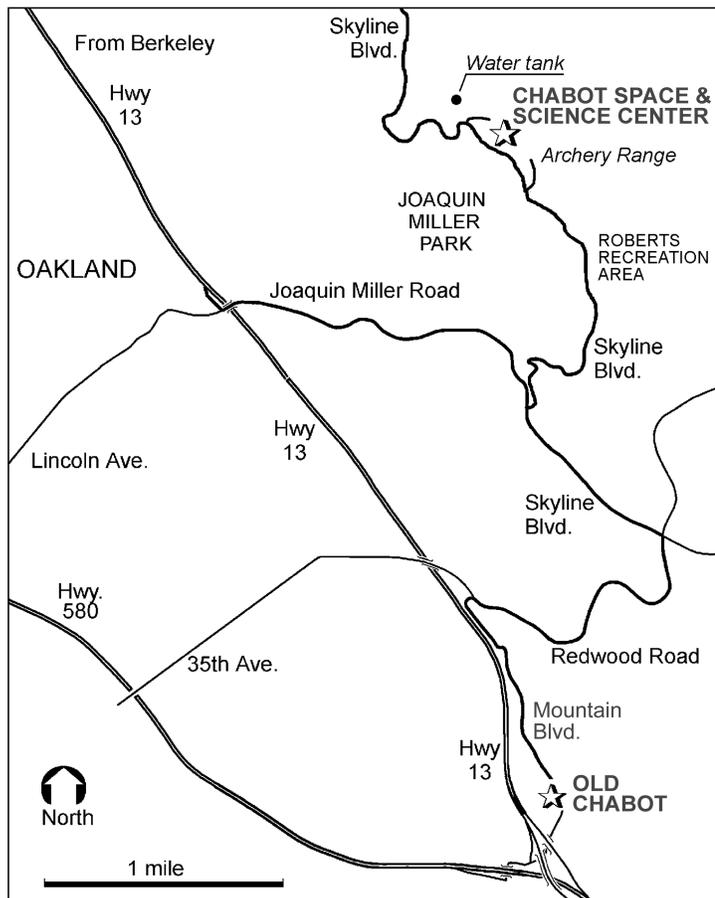
Please also cc: Lew Epstein, 614 Vermont St., SF CA 94107-2636. ★



Eastbay Astronomical Society

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

January 2002
RETURN SERVICE REQUESTED



FUTURE CONJUNCTIONS

January 2002

- 5 7:30pm EAS General Meeting, Chabot
- 10 7:30pm EAS Board Meeting, Chabot

February 2002

- 2 7:30pm EAS General Meeting, Chabot
- 14 7:30pm EAS Board 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 January issue is December 15, 2001. 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

<input type="checkbox"/> Regular, \$24/year	<input type="checkbox"/> Family, \$36/year
<input type="checkbox"/> Contributing, \$40/year	<input type="checkbox"/> 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