



The Refractor

The Bulletin of the Eastbay Astronomical Society

Founded in 1924 at Chabot Observatory, Oakland, California

Volume 76
Number 6
February 2000

Full Moon: Apollo Mission Photographs of the Lunar Landscape

Saturday, 19 February 2000

- General Meeting – 7:31 pm
- Lecture – 8:20 pm

Chabot Observatory

4917 Mountain Boulevard, Oakland

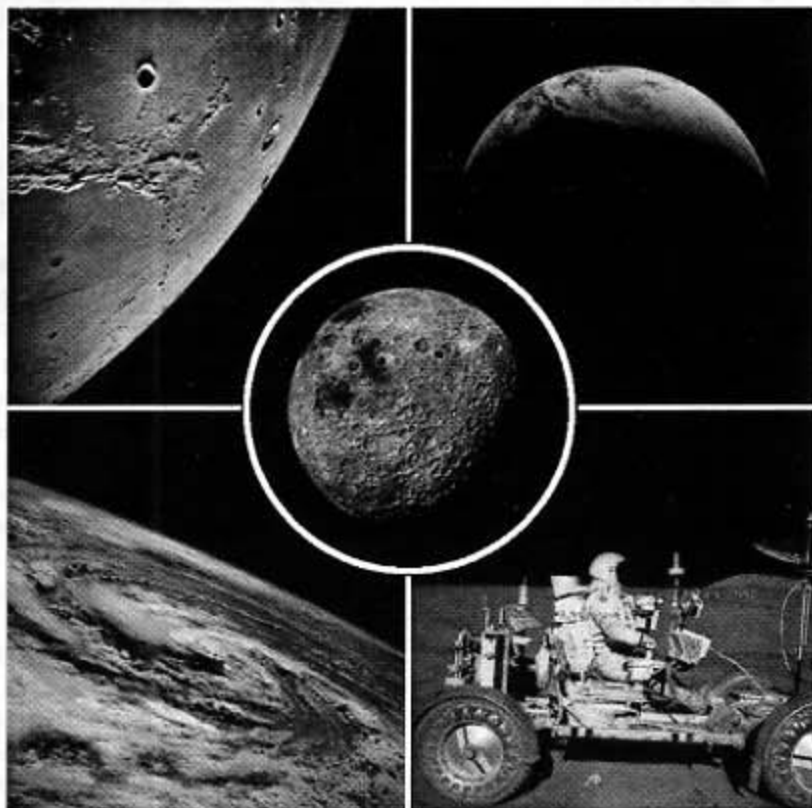
Michael Light

Michael Light Studio, San Francisco

For the last four years, Michael Light has worked with the NASA Apollo photographic archive to create the definitive visual survey of the manned lunar explorations, a project titled *Full Moon*. Random House International published his artist's book of the same title in June 1999 to global acclaim, with American (Alfred A. Knopf), British (Jonathan Cape), French, German, Italian, Spanish, Swedish and Japanese editions released. The San Francisco Museum of Modern Art opened Light's exhibition *Full Moon: Apollo Mission Photographs of the Lunar Landscape* on August 20th, where it ran until January 2000. *Full Moon* will be the inaugural temporary show at the American Museum of Natural History's new Rose Center for Earth and Space in New York, opening March 2000 and running through September. A European version of *Full Moon: Apollo Mission Photographs of the Lunar Landscape* was exhibited to public and critical praise from July to September at London's Hayward Gallery. Other European *Full Moon* venues have been Madrid's Circulo de Bellas Artes in October 1999, and Amsterdam's Huis Marseille/Foundation for Photography from December 1999 to March 2000. The show will travel to the Museum of Contemporary Art in Sydney, Australia in the Fall of this year.

Light's talk will be about the project, the images, the implications and meanings of Apollo, and the meanings of the Moon as a landscape and a place in its own right.

Born in 1963, Michael Light received a Bachelor of Arts in American Studies, Summa Cum Laude from Amherst College in 1986. Before receiving a Master of Fine Arts in Photography from the San Francisco Art Institute in 1993, he worked as an environmental lobbyist for the Sierra Club. A photographic artist and bookmaker concerned for the last decade with how cultures relate to the land and the environment, his cinematic



A selection of Apollo Program photos from the Full Moon exhibit. Others can be found at www.projectfullmoon.com. All images are Copyright, Michael Light.

photo-novel *Ranch* was published by Twin Palms Publishers/Twelve Trees Press in 1993, and he has had solo photographic shows at The Chrysler Museum, Norfolk, Virginia, and the Robert Koch Gallery, San Francisco. His work is in the collections of the San Francisco Museum of Modern Art, The Center for Creative Photography, and the Mead Museum.

DINNER WITH THE SPEAKER

5:27 PM, Saturday, 19 February 2000

PEARL OF SIAM

5498 College Avenue, Oakland (510) 420-8600

Please call Betty Neall at 510/533-2394 by Friday, 18 February to confirm your place. Note the time has been advanced to allow everyone to be able to get to the meeting promptly at 7:31 PM.



Welcome New Members

Please welcome these new members of the Eastbay Astronomical Society.

Leo Deegan	Oakland
Carl Ohlson	Oakland
Elizabeth Royster	Berkeley
Debbie and Phillip Scherrer	Castro Valley
Masaaki Yamato	Berkeley

Canis Major and Canis Minor

are customarily associated with the great hunter, Orion, as his hunting dogs, following him obediently across the sky. Each of the constellations has but a single notably bright star: Sirius, the Dog Star, is well known as the brightest star of all (3½ times as bright as Arcturus, second ranked among northern hemisphere stars); and Procyon, the Before-Dog star, is well known, too, because it rises above the horizon just before Sirius does. Both stars are binary double stars, each with a white dwarf companion. Both are relatively close, 8.7 light years for Sirius, and 11 light years for Procyon. In fact, the only stars closer to the Sun than Sirius can be seen only from southern skies. Sirius has a diameter twice that of the Sun, while its companion Sirius B is tiny, only about three Earth-diameters in size, but nearly as massive as the Sun, many thousands of times as dense as either Sirius or the Sun. As the companion of the Dog Star, this star is sometimes called the Pup. It was discovered in the year 1862 by the renowned telescope maker Alvan Clark while he was testing a new 18-inch refractor pointed at Sirius. It had previously been predicted that Sirius had a binary partner after the discovery in 1834 of a strange irregularity in its position. Although Sirius B is a respectable 8.4 magnitude star, its closeness to the brilliant Sirius makes it nearly impossible to detect with a telescope of less than 10 inches of aperture. The white dwarf neutron star companion to Procyon is even more dense than is Sirius B. It was first seen at the Lick Observatory in 1896.

Sirius and Procyon are two of the stars that comprise the Winter Oval asterism. Some refer to this group of first magnitude stars as the Winter Hexagon, counting Pollux and Castor as a single corner of the shape. For those who may be unacquainted with this idea, the other stars, clockwise from Sirius and Procyon, are Pollux and Castor in Gemini, Capella in Auriga, Aldebaran in Taurus, and Rigel in Orion. Sometimes Bellatrix and Betelgeuse are added to this group, but omitting Aldebaran, to form a giant figure 6 signaling a right ascension of 6 hours.

In the mythology of ancient Egypt, Osiris and Isis descended to the earth to bless the inhabitants. Isis showed them how to grow wheat and barley, and Osiris taught agriculture and also gave men laws and promoted the worship of the gods. He made

the valley of the Nile a happy country, then he left his wife Isis in control of the government and set out to continue his good works in other lands. He conquered nations everywhere with music and eloquence, not with weapons. His brother Typhon became envious and plotted to kill Osiris through a malicious conspiracy. When Isis heard of the cruel murder she wept such tears that the Nile rose and overflowed its banks. From that time forward the annual rising of the Nile brought the life-giving renewal of fertility to the valley. Above, the star Sothis was identified with Isis, and this brilliant star (Sirius) was welcomed each year to herald the Nile flood. The day when it first was visible before dawn marked New Year's Day, the most important day of the year. Temples erected to Isis were oriented to the exact spot where Sothis would rise. Sothis was the leader of 36 stars, called the Deccans, that followed each other at intervals of ten days throughout the year. By the heliacal rising of these stars, the Egyptians kept track of their calendar, adding five days to complete the year.

This part of the Chinese mythological sky also features canines. Sirius was the symbol of T'ien-lang, the Wolf of the East, who hid among the tall crops as he lay in ambush for pheasant and quail. After dark, he would prowl the farmyards to raid and feast on chickens and ducks. The ancient kings of China organized hunting parties to bring down the wolves. They loosed their dogs, T'ien-kaou, represented by other nearby stars, who chased T'ien-lang toward the hunters waiting with their bows and arrows, also seen in the sky as the stars south of Sirius.

Of objects for binocular viewing in Canis Major and Canis Minor there are few. M41 is a beautiful open star cluster containing about a hundred stars. It is just visible to the naked eye and is just south of Sirius by four degrees. Stars of several different colors including some very red stars are in the field. R Canis Majoris is a variable star with a very short period, doubling its brightness from magnitude 6.7 to 5.9 in 27 hours.



Planetary nebula IC 2165 is about five degrees north of Beta Canis Majoris. Conrad Jung used a CCD camera, combining 5 exposures of about 30 seconds each to produce this image. The seeing wasn't very good, so the nebula looks like a star.

There are also some pretty double stars including the orange and pale blue h3945. Mu-Canis Majoris is a white-blue quadruple star. The best time for viewing Sirius and the neighboring deep-sky objects is at the time it crosses the meridian, and that is about 10 PM during the first part of February.

A Friend Is Gone

My friend John Hewitt died as the 20th century came to a close. For many years, I noticed John at various astro events. We sat in the same section of the Morrison Planetarium during the Benjamin Dean lectures for 10 years. He was hard to miss. He wore Hawaiian print shirts. In the winter. He had long hair, at least it was long at the bottom end. A few strands swept over the top. Maybe four strands maximum! He wore sideburns in the mutton chop style. He wore horn-rimmed glasses, too. The reason I remembered him so vividly was that he always asked questions at the lectures we both attended. And they were good questions! Each speaker was challenged to answer a thoughtful and intelligent and polite question from a fellow astronomer. John was a universal astronomer. I learned a lot from the answers to his questions. Questions I might have liked to ask myself but didn't.

One day a few years ago I was at the Lawrence Hall of Science for a Project Astro workshop. As I walked to the room where we held our session I saw this same mutton-chop-sideburned-Hawaiian-shirt-clad person in the Physics lab. He was waving his arms. A room full of kids were watching him in rapture. "Aha! He works here!" I thought to myself. I still didn't know who he was though.

Shortly after that, my astronomy club, the San Francisco Amateur Astronomers, asked me to be the representative to the AANC. That's the Astronomical Association of Northern California, a collective of astronomy clubs, science centers and other astronomy resource places. I didn't really want to do it, but I said yes. When I attended my first meeting, there was this same guy, same sideburns and same Hawaiian shirt sitting at the table. We instantly became friends, astronomy friends, the best kind of friend. He had my same sense of humor, and same passion for promoting amateur astronomy. Soon I was the AANC President, but only because John was my Vice President. We were a marvelous team. A team I was proud to be part of.

We worked together on so many projects. We had a lot of the same passions. John wanted to reinstate a Fall Astronomy Day. So did I. Side by side, we became friends and side by side, we made Fall Astronomy Day happen again. Not a day went by for years that we didn't exchange e-mail on this project or that project. Astronomy Projects. Debates. He even asked me questions and made me answer them. He was one of the few people who could make me work! I called him and he called me. We made each other laugh. He inspired me so much. He was a true friend and soul mate.

John had a special knack for selecting the right words for everything. He wrote beautiful words and spoke beautiful words. He was a beautiful person. I sat in the LHS planetarium several times while he did shows there. He lit up the plan-

etarium with his description of the universe. He was captivating! He had a gentle way of making me reach farther and I already miss his presence.

I have a few favorite memories of John. He produced and directed the Comet Players in a production of the life of Maria Mitchell, woman comet discoverer (1818 - 1899). He created special effects to use the Morrison Planetarium as a canvas of Maria's universe. As a planetarian, he made the most of the equipment, and the audience was thrilled! It was a work of art! It was dramatic. It was fun! Art and Science blended together. He looked like a wild man, grabbing props, moving them around dramatically while the two young women actors presented the show to the SFAA. It was marvelous.

Another favorite memory of John is from the AANC conference in 1998 when we did a Science Fact or Fiction theatre segment. I brought a metal colander to demonstrate an astronomy activity I had developed. It was destined to be a radio telescope, in an activity about the discovery of pulsars with me as Jocelyn Bell. But John had other plans! He wore it on his head in a skit. I have that moment captured on a photograph.

Yet another is when John made a presentation to our SFAA club about his Hubble Telescope project. He was one of the first amateur astronomers to gain time on the Hubble, in an amateur project now cancelled. It was thrilling! John was going to give me the notes so I could write up his talk. We never got around to it.

When I heard that John had died, I was glad I had that photo of him wearing my colander on his head. I do have other photos of him, but that is my favorite. It sort of sums up my memories of John. The consummate astro actor. The question asker. The thinker. The star weaver! The storyteller! My brilliant friend! Damn it, John! How am I going to know all the answers to questions without you to ask them? I guess I'll have to ask them myself!

I don't know very much about John Hewitt's credentials or his life outside of astronomy. I wish I could thank his family for sharing him with me for just a little while. I do know that the AANC, of which I am the current president, awarded him the professional astronomer of the year a few years ago. I know that the kids in the after-school astronomy classes at the Lawrence Hall of Science got to make cool astro stuff with him. I know that every Saturday night he shared the universe with all of those who traveled to the Lawrence Hall of Science for a look into the past through John's time machines. I know that he inspired me and made me think and made me laugh. There is one less light in Berkeley, California tonight. John is not with us anymore. But there is one more light in the heavens above. I see John's inspiration sparkle when I look into the night sky.

Jane Houston, AANC President



Reynolds Wrap

By Mike Reynolds, Executive Director

As you might be aware, Chabot has (again) made a name change. In a major announcement during January's total lunar eclipse, the new name "Chabot Space & Science Center," along with a new logo, was unveiled. The press coverage of not only the name change but the eclipse was excellent and included a nice segment on CNN Headline News.

The name history of Chabot is interesting: Oakland Observatory, Chabot Observatory, Chabot Science Center, Chabot Observatory & Science Center (new Chabot), and now Chabot Space and Science Center. Don't worry: the observatories will always be known as the Chabot Observatory.

My sincere thanks to everyone who helped with the eclipse; a number of EAS members set up telescopes to augment Leah observations. And Carter Roberts braved the mud at the new site to photograph the eclipsed moon over the shoulder of the new 8-meter dome for Leah.

Zeiss Technicians arrived in January to begin installation of Chabot's new Zeiss Universarium Planetarium. Progress has been terrific and we've already seen some of the

results in the form of the planets, sun and moon.

Installation has also begun on other planetarium equipment, the introductory exhibit, lab furniture, and the 45-ft dome for Rachel! Richard Smith and I did the final inspection of the dome in Jackson, Mississippi last month at the ObservaDome factory. My first reaction: "this thing is BIG." We are very pleased with the quality and believe that Rachel will have a good home.

We received notification from the White House that Chabot has been selected as a White House Millennium Partner. The theme is "remembering the past—looking to the future," which well fits Chabot.

Keep looking up!



Points of Light

[The Refractor welcomes items about EAS members in the news, their published articles, their conference presentations, or word of their completed astronomical projects.]

Lewis Epstein will be the featured speaker at the February 22 meeting of the Mount Diablo Astronomical Society. His topic will be the title of one of several books Epstein has authored, "Relativity Visualized."

Mark Gingrich is the author of a letter in the March 2000 issue of *Sky & Telescope*. He posits that the true inventor of the telescope may have been Leonardo da Vinci.

Chabot Observatory was awash with media people on the night of the lunar eclipse, January 20. Several TV camera crews set up live remotes for the late-evening news, with EAS and Observatory folk prominently featured. Among those in the spotlight were **Jack Preston** and daughter **Julie Preston**, who, along with **Dr. Mike Reynolds**, were interviewed for KRON's *NewsCenter4*. (Jack, Julie, Mike and **José Olivarez** also were mentioned in the following day's *San Francisco Chronicle*, which had a front-page image of the eclipsed Moon being "eclipsed" by a jetliner, a photo captured from the Observatory's roof.)

Eclipse observing at Chabot likewise was the lead story in the next day's *Oakland Tribune*, where **Conrad Jung**, **José Olivarez**, and **Dr. Mike Reynolds** found themselves quoted.

Aside from the fun, there's always some "risk" involved when attending such an event, as **Franklyn Creese**, **Mark Gingrich**, **Conrad Jung**, and **Alan Roche** discovered. They were "coerced" into viewing the Moon through Conrad's telescope by the KNTV Channel 11 crew, who needed appropriate background scenery for their reporter's live feed from Chabot.

Roberts Rules

By Carter Roberts

Those of you who wish to make a memorial donation in remembrance of John Hewitt are encouraged to contribute toward the purchase of a telescope for use in the Saturday Night Stargazing Program at the Lawrence Hall of Science. You should make checks payable to the Regents of the University of California and send them to the John Hewitt Fund, c/o Louise Archie, Lawrence Hall of Science, 1 Centennial Drive, Room 215, Berkeley, California 94720-5200.

Last October we told you of the goal of procuring a telescope for use in the missionary field in Haiti. Chabot Executive Director Mike Reynolds would like to realize this quest, and would welcome donations of money for this use. Why not put a few dollars of your year 2000 charity budget in an envelope and send it to Mike at Chabot Space and Science Center, 10902 Skyline Boulevard, Oakland, California 94619!

Another appeal for help from EAS members is on behalf of our Treasurer, Don Stone. Don is in great need of assistance in finding a job and housing. If you know of an opening for an able bookkeeper or accounting clerk (or almost any other type of job), or if you can steer him to affordable housing, please contact Don immediately by phone at (510) 336-3680 or by e-mail at ddcstone@earthlink.net. Don has been a hard worker for EAS and for Chabot for many years and merits your helping hand.

Join the Eastbay Astronomical Society

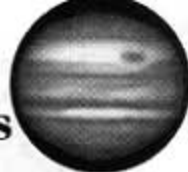
Membership per year:

- | | |
|---|---|
| <input type="checkbox"/> Regular, \$24 | <input type="checkbox"/> Family, \$36 |
| <input type="checkbox"/> Contributing, \$40 | <input type="checkbox"/> Sustaining, \$60 or more |

Contact: Don Stone, EAS Membership Registrar

Telephone: (510) 336-3680 E-mail: ddcstone@earthlink.net

José's Observations



by José Olivarez

Three Buried Treasures of the Greater Dog

The first buried treasure of the Greater Dog (Canis Major) is Sirius with its famous companion, Sirius B, is the brightest star in the sky (magnitude -1.4); and its companion, Sirius B, is a famous white dwarf star. The magnitude of Sirius B is 8.65, but its visibility is now masked by the brilliant light of Sirius. However, Sirius B is now moving away from Sirius as it continues its 50-year orbit around the star and should again be visible in amateur telescopes of excellent quality by 2008. I last saw Sirius B with a 10-inch reflector of excellent quality back in 1984 when it was eight seconds of arc distant from Sirius. Sirius B will again be eight seconds of arc away from Sirius in 2008 but you do not really have to wait until then to see a white dwarf star through your telescope. In fact, February is the perfect month to see the white dwarf companion of Omicron-2 in Eridanus. Omicron-2 (also shown on star charts as 40 Eridanus) is a triple star system with both a white dwarf and a red dwarf for companions! The white dwarf (Omicron-2 "B") lies 82.8 seconds distant from Omicron-2 and has a red dwarf companion (Omicron-2 "C") only nine seconds away. This triple star system can be observed well in apertures as small as four inches.

M41 is the second buried treasure of the Greater Dog. It is located at R.A. 06h49m, Dec. $-20^{\circ}42'$. It is Canis Major's best known open cluster because it can be seen with the naked-eye under ideal dark-sky conditions. It had also been called "the little beehive" because it looks like a smaller and fainter version of the "Beehive" (M44) visible further north in Cancer. M41 contains about 100 stars of magnitude 7 to 13 and is resolvable in 10 \times binoculars and finder scopes. Its true diameter is 20 light-years and its distance is given as 2350 light years. One of the faintest objects recorded in classical history—it was seen by Aristotle—M41 shines at magnitude 4.5 and fills an area of sky 30 percent larger than the full Moon. Its stars are believed to be 100 million years old.

The third treasure of the Greater Dog is a deeply buried (and often overlooked) gem of a star cluster. This is the Tau Canis Majoris Cluster also marked on star charts as NGC 2362. The star "Tau" is a fourth magnitude star (30 Canis Majoris) located inside the cluster. (The location of NGC 2362 is R.A. 07h10m, Dec. $-24^{\circ}52'$). This little cluster is a very attractive grouping of about 60 stars whose magnitudes range from 7.5 to 13. The distance is given as 4600 light years and is one of the youngest star clusters known, being about one million years old. But NGC 2362 is not the youngest cluster of stars in our February evening sky. For a look at an even younger group of stars (only a quarter of a million years old) look at the "Trapezium" cluster inside the Orion Nebula! One of the best views of NGC 2362 that I have ever seen was with a 5-inch Astro-Physics f/10 refractor used with a 20-mm wide-angle eyepiece. The cluster looked simple gorgeous! Finally, there is an excellent photo of this cluster in Burnham's *Celestial Handbook* (Volume One).

The Space Shuttle Program

joins PCs, CDs and E.T. among the memorable icons of the 1980s that are honored on 15 new commemorative postage stamps issued by the U.S. Postal Service at the Kennedy Space Center.

The 1980s stamps were selected by the public during nationwide balloting in February 1999, as part of the Celebrate The Century stamp and education program.

The stamp subjects selected were: Video Games, which received the most votes, Fall of the Berlin Wall, Vietnam Veterans Memorial, "E.T. The Extra-Terrestrial," Hostages Come Home, "The Cosby Show" (Hit Comedy), "Cats" (Musical Smash), Hip-hop Culture, Figure Skating, San Francisco 49ers, Personal Computers, Compact Discs, Cable TV, Space Shuttle Program and Cabbage Patch Kids.

This descriptive text appears on the gummed side of the Space Shuttle Program stamp: Space shuttles have transformed U.S. space exploration. These reusable crafts can launch satellites and house labs for scientific experiments. Columbia, the first space shuttle, was launched April 12, 1981.

The Celebrate The Century program honors some of the most significant people, places, events and trends of each decade of the passing century. Over a two-year period the public was offered opportunities to vote for stamp subjects honoring the 1950s through the 1990s.

Among the public's fifteen selections made earlier to decide the 1950s stamp subjects were Drive-In Movies, "I Love Lucy" and Dr. Seuss' "The Cat in the Hat." Their choices for the '60s included Man Walks on the Moon, Super Bowl I and Peace Symbol. The subjects picked to represent the '70s included the Smiley Face (America Smiles), "Sesame Street" and Earth Day.

The Celebrate The Century series, presented in collectible 15-stamp panes honoring each decade from the 1900s through the 1980s, is now available at post offices across the country. The stamps are also available by calling toll-free 1 800 STAMP-24 or online at www.stampsonline.com.



Millennium Stamps

From the *Times* (London), December 20, 1999:

"The Isle of Man will issue a set of stamps for the new millennium in the last minute of 1999 and the first two minutes of 2000. The first will be a 50p stamp, depicting Mars descending into the sunset at the Calf Sound, the island's most westerly point; on the stroke of midnight, a £2 stamp will be released, showing an astronomically accurate depiction of the night sky over the Isle of Man; and at 00.01, a third stamp, featuring Venus rising in the dawn over Maughold Head, the island's most easterly point, will be issued. The island has a postal system independent of the Royal Mail."

Contributed by EAS member Marshal Merriam.

Eastbay



Astronomical Society

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DATELINE FEBRUARY

- 5 2000 New Moon, 05:04 PST = 13:04 UT
- 12 2000 First Quarter Moon, 15:21 PST = 23:21 UT
- 19 2000 Full Moon, 08:27 PST = 16:27 UT
- 26 2000 Last Quarter Moon, 19:55 PST
= 03:55 UT 27 February

Eastbay Astronomical Society

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Articles and photos for *The Refractor* are encouraged. Deadline for the March issue is February 25, 2000. Items may be submitted by mail to the editor, Ellis Myers, 215 Calle La Mesa, Moraga, CA 94556. Internet e-mail address: eas@silcon.com. For further information please call (925) 284-4103.

Internet: <http://silcon.com/~eas> • <http://chabot.cosc.org/~eas>

NCHALADA

The next meeting of the Northern California Historical Astronomy Luncheon and Discussion Association will be on Saturday, February 12, 2000 at Chabot Observatory. The morning session, chaired by Bruce Mehlman, will discuss the Copernican Challenge. Nancy Cox will chair a review of Famous Meteor Showers in the afternoon session.

FUTURE CONJUNCTIONS

February

- 12 7:30 PM NCHALADA, Chabot
- 17 7:30 PM EAS Board meeting, Chabot
- 19 7:31 PM EAS Meeting, Michael Light
Apollo Project Images

March

- 16 7:30 PM EAS Board meeting
- 18 7:31 PM EAS Meeting, Dr. Jeff Moore
Galileo Update

April

- 8 Astronomy Day
- 8 7:31 PM EAS Meeting

Chabot Observatory Programs • February

Planetarium programs at the Mountain Blvd. Observatory location are suspended pending the move to the new Chabot Space and Science Center.

However, through the end of March, our 8" telescope will continue to be available for free public viewing on Friday and Saturday evenings, 7 - 11 PM, weather permitting. EAS members will also have smaller telescopes set up at these times. No reservations are needed.