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The Refractor

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

Volume 79
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This month's talk:

Mars: Up Close and Personal

Saturday, August 9, 7:00 pm
Chabot Space & Science Center
Ask Jeeves Planetarium*, Spees Building
Pick up complimentary ticket at Front Desk **first*

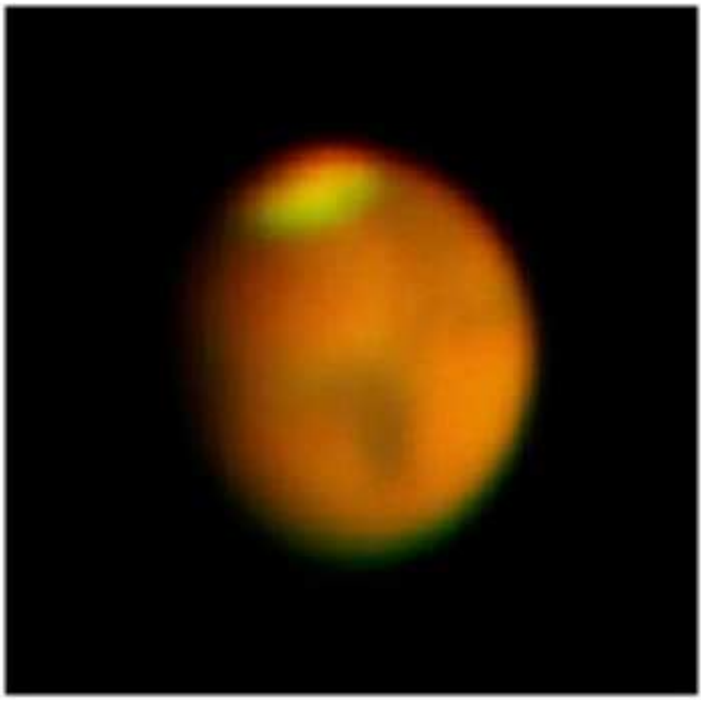
Speaker: Dr. Chris McKay

The close pass between Mars and the Earth this month has brought public interest in the "angry red planet" to an all-time high! Depending on who you heard it from, Mars hasn't been this close to us in either *thousands*, *tens of thousands*, or even *hundreds of thousands* of years. Suffice it to say, it hasn't been this close to us in a lo-oo-ong time. So far, the planet-wide, detail blotting dust storms that sometimes occur when we do pass close by, haven't happened, yet, and the views are getting more and more spectacular by the day. As the visible disk of the planet continues to grow, we will see it even better! In honor of this rather momentous occasion, our Programs Director, Dave Rodrigues, cannily invited NASA scientist, Chris McKay, to be this month's speaker. He will give us the up-to-the-minute info on current and upcoming NASA Mars missions, along with the latest thoughts about water and the possibility of life, there. This talk is expected to be *very* popular; so much so, that Chabot is letting us use the planetarium so that we can accommodate more attendees!

Please note that while the lecture is still free to EAS members, you must stop by the Front Desk, *first*, to pick up a complimentary ticket in order to get in to the talk.

Christopher McKay, Ph.D. Planetary Scientist with the Space Science Division of NASA Ames, received his Ph.D. in AstroGeophysics from the University of Colorado in 1982, and has been a research scientist with the NASA Ames Research Center since that time. His current research focuses on the evolution of the solar system and the origin of life. He is also actively involved in planning future Mars missions, including human settlements.

Chris has been involved with polar research since 1980, traveling to the Antarctic dry valleys and more recently to the Siberian and Canadian Arctic to conduct research in these Mars-like environments. ✯



Conrad Jung took this recent picture of Mars, and as good as it is, it does not show the fine degree of detail that is possible to see

DINNER WITH THE SPEAKER
5:00 pm
Saturday, August 9, 2003
HUNAN YUAN
4100 Redwood Rd., #11
(next to Safeway)
Oakland
(510) 531-1415
Contact Dave Rodrigues at 510/483-9191 or daverod@aol.com by Friday, Aug 8th to confirm

Inside This Issue:

Next stop: Mars

from NASA website:
http://liftoff.msfc.nasa.gov/news/2003/news-mars.asp

Artist's rendition of the Eagle *in flight over Mars*

What will the next Mars exploration vehicle look like? You may be thinking in terms of a futuristic nuclear-powered craft, but the first Mars airplane was recently tested--and it performed flawlessly. It's not the kind of airplane most people think of; it won't take off from an airport runway, for instance. The Mars airplane, the Aerial Regional-scale Environmental Survey of Mars, or ARES for short, is launched into space by a rocket, stored in a protective case called an aeroshell, and when it approaches the surface of the planet, it's released for its descent. The first planes won't carry people, but future plans do include human passengers.

ARES is proposed for the Mars Scout mission. When it is released from its rocket, instead of landing on the red planet, it will fly 2.5 kilometers (1.55 miles) above the surface and gather data about the geology, the atmosphere, and other important scientific concerns. That information will be relayed back to Earth, where scientists will receive and analyze the findings.

Engineers check out the Eagle prototype

Previous missions to Mars have analyzed the planet's characteristics. The most memorable mission used the 1997 Sojourner rover. Its purpose was different, though. It traveled about 6 meters (20 feet) in each direction from its landing site and collected a great deal of information for researchers. Other missions have flown by the planet, orbited it, and recorded images of the planet. ARES does something in between. It doesn't collect data by landing on the planet, but it gets close enough to gather detailed information about the surface and crust of Mars. It records information covering hundreds of kilometers, rather than several dozen, in a region called the planet's Ancient Southern Highlands. The information returned will have higher resolution than that captured by orbiting satellites, and will contain direct measurement of water vapor and gas concentrations in the near-surface Mars atmosphere.

The next steps, of course, involve preparing ARES for a full trip to Mars, which is planned for about 2007. The important basics have been solved, however. The Mars airplane can be released from its aeroshell, can unfold its wings and tail sections, and can follow a preplanned route to recover information. Next stop: Mars.

A weather balloon carries the Eagle *aloft for flight testing*

The ARES prototype plane is called the Eagle, and in 2002, it completed its first flight in conditions similar to the atmosphere of Mars. How can it do that while on Earth? The Eagle was taken to a height of approximately 31,550 meters (103,500 feet), where the atmospheric pressure is lower and less dense. To attain those heights, a high-altitude research balloon lifted the Eagle. One of the biggest challenges for the Eagle was the size constraint of the balloon--which is similar to the size restrictions of spaceflight. To be more compact, the wings and tail sections were folded underneath the fuselage, and the entire craft was packed into the aeroshell protective case. As the Eagle was released from the shell, the wings unfolded, the tail straightened, the engine started, and the Eagle began its self-propelled, predetermined flight. When it landed, the mission was declared a full success. ✯

Mars Fast Facts:

Size: 4,220 miles
Number of Moons: 2– Phobos and Deimos (Fear and Panic)
Distance from Earth on August 27, 2003: 34,646,418 miles
Average distance from Sun: 142 million miles
Atmosphere: Carbon dioxide with some water vapor
Average Temperature: -81 degrees Farenheit (cold!)
Length of Day: 24 hours, 37 minutes
Length of Year: 687 Earth days
Why Mars is red: Iron oxide (rust) in its atmosphere and on the ground makes the entire planet reddish.
Mars has the tallest volcano in the Solar System: Olympus Mons, at about 15.5 miles high. Mt. Everest is only about 5.5 miles high.
Mars also has the largest valley in the Solar System: 6.2 miles at its deepest (6 or 7 times as deep as the Grand Canyon), and is as long as the entire United States is wide.
How rocks from Mars end up as meterorites on Earth: Large meteor impacts on Mars blew up debris of the collision fast enough to achieve escape velocity away from Mars' gravity. It then gets caught in Earth's gravity to fall as meteorites. ✯

Editor's News 'n Views

Howdy Astro Fans! The big news for this and next month is: the Mars Opposition. The EAS is running special viewing sessions up at Chabot on Saturday nights from July 19 through September 6, starting at 11pm and going until 2am using the 8" refractor, Leah. We're not using Rachel, as Mars doesn't get very high off the horizon, and that means the eyepiece end of Rachel will stay pretty high off the floor, and we are uncomfortable sending people too high into the air in the dark. As of this writing we're batting .500, with one cloudy night, and one perfect night; and the view (so far) is spectacular! Another big news item (well, for me, at least); I am now a fully accredited and licensed Operator for both Leah and Rachel <yay!> I remember the first time I saw Rachel in 1998 down at the old Mountain Blvd location, and found out that it was possible for someone as lowly as myself to learn to operate her. I knew then that I wanted to do just that. Five years later, my dream has come true, and I can now operate both Leah and Rachel - wow, what a privilege!

A perfect night at Nellie. That's Mike Reynolds at the eyepiece. The two to the right of Conrad Jung are Board members Doug Seiden and Dick Spees. Photo by Carter Roberts

Now, mind you, I'm still learning how to find objects with them; that's a trick-and-a-half in and of itself, let me tell you. Their polar alignments and setting circles still need some tweaking, before they can be used to find objects, spot-on, and Rachel can be a bi…, uh, can be *very difficult* to roll in right ascension for fine adjustment, when she's pointed north or south. Plus, it will be a long time before I'm half as good at finding things as *The Master* (Conrad), but I expect it will be an enjoyable journey to Master-dom, tough RA rolls notwithstanding. For anyone interested in becoming an Operator, too, let me warn you: it's not easy! You have to be willing to volunteer your time; you have to have a fair command of general astronomy (constellations, planets, stellar evolution, different telescope designs, sky mapping coordinate systems, etc.) some of which you can learn as you go, but experience with these things is a definite help. Plus, it just takes lots patience, and even a fair bit of physical strength (not a lot, but you can't be no wimp, neither). But if you think you can, let Conrad know; he is always on the lookout for more operators, to help ease the strain of public viewing. I can speak with *Authority*, when I say that operating these gorgeous, antique telescopes is tons o' fun, an incredible privilege, and for the good cause of public education, to boot.

The current figure for donations to buying a memorial chair plaque in the planetarium for our friend Betty Neall stands at $450, just $50 shy of the full amount. In a wonderful gesture by Chabot's Executive Director, Alexandra Barnett, CSSC will *also* donate a chair in the planetarium in Betty's memory, so she's likely to be the only person to have *two* chairs with her name on them. But, we still need $50 more for the EAS donation, so don't be shy! Give a little to remember EAS' most dedicated member of all time. Any extra funds we receive will go towards the other fund we've got going for the annual *Betty Neall Award of Excellence*.

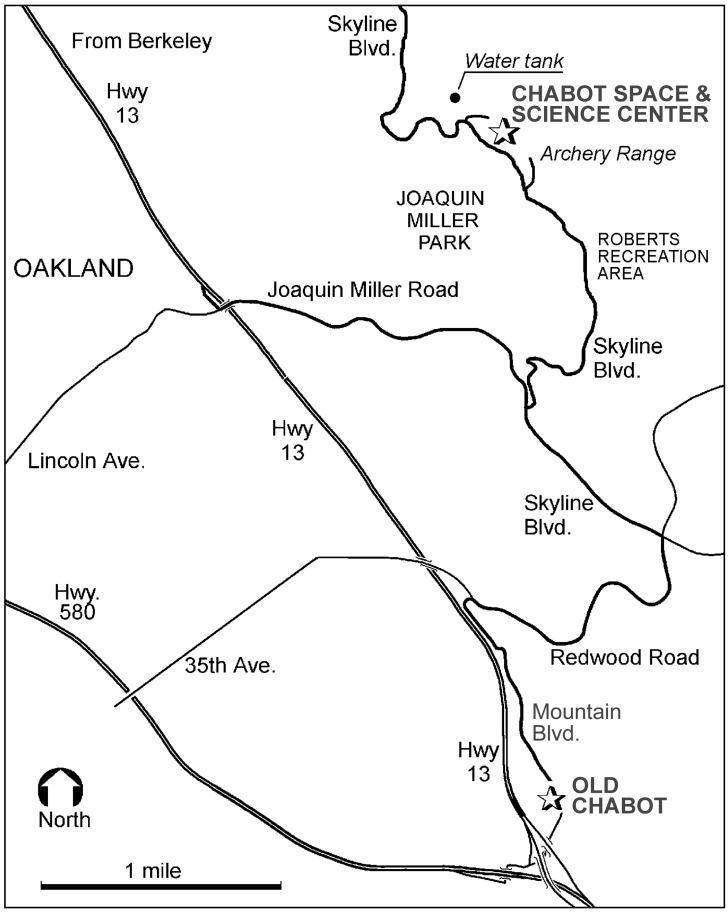
Our Treasurer, the redoubtable Don Stone, has a little bit of bad news for us: the cost of Sky & Telescope magazine is going up from $29.95 to $32.95, a hike of $3. Also, *Astronomy* magazine is implementing a somewhat odd new subscription policy. All new subscriptions start with the January issue, no matter what time of the year the subscription is submitted. So, for example, if you send in a new subscription during the month of March 2004, the first magazine you get will be the January 2005 issue(!)

This is a short issue (only four pages instead of the usual six) as, hopefully, all my usual article resources are out doing astronomical things so they can send in lots of future articles, because they seem to have all disappeared on me this month. And things being such, I'd like to take this opportunity to invite *you* to submit an article or three, too. Did you visit an observatory, or get a new piece of telescope gear, or find a new comet (or whatever)? Let's hear about it!

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

Eastbay Astronomical Society

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



FUTURE CONJUNCTIONS

Aug	2	10am – 4pm NCHLADA meeting at Chabot
	9	7:00pm EAS General Meeting at Chabot
	14	7:30pm EAS Board Meeting at Chabot
	23-24	Oakland Chinatown Streetfest from 10am – 5pm
Sep	11	7:30pm EAS Board Meeting at Chabot
	13	7:30pm EAS General Meeting at Chabot and Mars Viewing with EAS and SFAA
Oct	4	7:30pm EAS General Meeting at Chabot
	5	dusk Japanese Moon Festival at Garden Center, Lake Merritt
	9	7:30pm EAS Board Meeting at Chabot

Eastbay Astronomical Society

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Articles and photos for *The Refractor* are encouraged. Deadline for the September issue is August 23, 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.

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❑ Regular, $24/year
❑ Contributing, $40/year
❑ Sustaining, $60/year or more
❑ Family, $36/year
❑ Student, $15/year (digital newsletter, only)

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