

# The Refractor

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

Volume 83  
 Number 7  
 May 2007

## May 2007 talk:

### *Destination Moon—The Apollo Missions in the Astronauts Own Words*

Saturday, May 5, 2007, 7:30 pm  
 Speaker: Rod Pyle, Author

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

It was a pretty big deal when in the 1400s Christopher Columbus traveled a few thousand miles to find the “New World,” but, it wasn’t really a new world. It was just another part of the same old world. Five hundred years later, Neil Armstrong, Edwin “Buzz” Aldrin, and Michael Collins traveled nearly a quarter million miles to *really* make a landing on a new world—the Moon. In his remarkable book, *Destination Moon—The Apollo Missions in the Astronauts Own Words*, author Rod Pyle conveys the story of the Apollo Space Project as told by the astronauts, themselves. In his talk to the Eastbay Astronomical Society, he’ll tell the story about what it was like to document the most ambitious endeavor in all of human history.



Rod Pyle is a producer, writer and director of documentary programming for The History Channel, Discovery Communications and PBS; as well as an author of non-fiction books. Recent work includes "Modern Marvels: Apollo 11" for Hearst Communications and "In Their Own Words: The Space Race" for First Person Audio.

Rod is a frequent contributor to other publications, including *Dreamwatch*, a UK-based science fiction magazine. He was also a science consultant to the new *Battlestar Galactica* TV series which premiered in 2004.

Rod spent two years as a visual effects consultant on *Star Trek: Deep Space Nine*, and was a visual effects producer for Joe Dante’s *Warlords: Battle for the Galaxy* for Paramount Studios.

Rod was formerly employed at the Griffith Observatory in Los Angeles, CA, where he served in various capacities for



Neil Armstrong can be seen reflected in Buzz Aldrin’s visor as he took this photograph. Photo Courtesy of NASA

over 10 years. During his tenure, he produced *Launchlink*, a public celebration of NASA’s Space Shuttle in conjunction with NASA and FOX-TV, as well as authoring numerous handbooks. He was also a liaison to the Jet Propulsion Laboratory for numerous unmanned planetary programs including *Voyager’s 1 and 2*.

His book "*Destination Moon*" was released on November 1, 2005 and goes into its second printing (softcover) in Jan. 07.

Rod lives in Pasadena, CA. with his wife and son. ★

#### DINNER WITH THE SPEAKER

5:30 pm

Saturday, May 5

HUNAN YUAN

4100 Redwood Rd., #11

(next to Safeway)

Oakland

(510) 531-1415

No need to confirm—just show up!

#### Inside This Issue:

<b>Clouds— Top to Bottom</b>	<b>2</b>
<b>RTMC?</b>	<b>2</b>
<b>News ‘n Views</b>	<b>3</b>
<b>Upcoming Events</b>	<b>3</b>
<b>Get away from it all</b>	<b>4</b>
<b>Spare Shots</b>	<b>5</b>
<b>Directions &amp; Schedule</b>	<b>6</b>

# Clouds from Top to Bottom

By Patrick L. Barry

**D**uring the summer and fall of 2006, U.S. Coast Guard planes flew over the North Pacific in search of illegal, unlicensed, and unregulated fishing boats. It was a tricky operation—in part because low clouds often block the pilots' view of anything floating on the ocean surface below.

To assist in these efforts, they got a little help from the stars.

Actually, it was a satellite—CloudSat, an experimental NASA mission to study Earth's clouds in an entirely new way. While ordinary weather satellites see only the tops of clouds, CloudSat's radar penetrates clouds from top to bottom, measuring their vertical structure and extent. By tapping into CloudSat data processed at the Naval Research Laboratory (NRL) in Monterey, CA, Coast Guard pilots were better able to contend with low-lying clouds that might have otherwise hindered their search for illegal fishing activity.

In the past, Coast Guard pilots would fly out over the ocean not knowing what visibility to expect. Now they can find out quickly. Data from research satellites usually takes days to process into a usable form, but NASA makes CloudSat's data publicly available on its QuickLook website and to users such as NRL in only a matter of hours—making the data useful for practical applications.

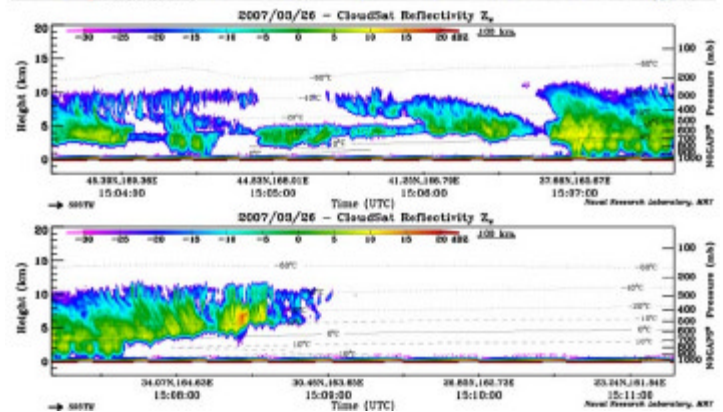
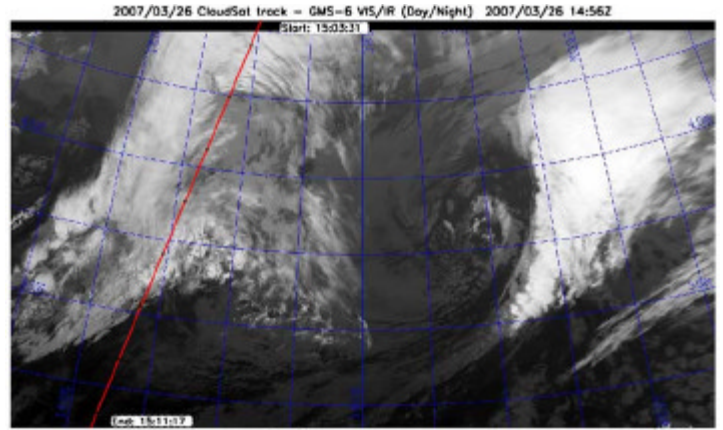
"Before CloudSat, there was no way to measure cloud base from space worldwide," says Deborah Vane, project manager for CloudSat at NASA's Jet Propulsion Laboratory.

CloudSat's primary purpose is to better understand the critical role that clouds play in Earth's climate. But knowledge about the structure of clouds is useful not only for scientific research, but also to operational users such as Coast Guard patrol aircraft and Navy and commercial ships at sea.

"Especially when it's dark, there's limited information about storms at sea," says Vane. "With CloudSat, we can sort out towering thunderclouds from blankets of calmer clouds. And we have the ability to distinguish between light rain and rain that is falling from severe storms." CloudSat's radar is much more sensitive to cloud structure than are radar systems operating at airports, and from its vantage point in space, CloudSat builds up a view of almost the entire planet, not just one local area. "That gives you weather information that you don't have in any other way."

There is an archive of all data collected since the start of the mission in May 2006 on the CloudSat QuickLook website at [cloudsat.atmos.colostate.edu](http://cloudsat.atmos.colostate.edu). And to introduce kids to the fun of observing the clouds, go to [spaceplace.nasa.gov/en/kids/cloudsat\\_puz.shtml](http://spaceplace.nasa.gov/en/kids/cloudsat_puz.shtml). ★

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



A CloudSat ground track appears as a diagonal line overlaid upon a GMS-6 (a Japanese weather satellite) infrared image. CloudSat is crossing the north-central Pacific Ocean on a descending orbit (from upper-right to lower-left) near a storm front. The radar data corresponding to this ground track (beginning in the center panel and continuing into the lower panel) is output in color and shows a vertical cloud profile far more complex than the two-dimensional GMS-6 imagery would suggest.

This image may be downloaded from:

[http://spaceplace.nasa.gov/news\\_images/cloudsat\\_pass.jpg](http://spaceplace.nasa.gov/news_images/cloudsat_pass.jpg)

## Are you going to RTMC this year?

Memorial Day Weekend: Friday, May 25—Sunday May 27

Each year, on Memorial Day Weekend at an altitude of 7,600' above sea level, the Riverside Telescope Makers' Conference occurs at Camp Oakes, near Big Bear City in southern California, about 50 miles SE of Riverside in the San Bernardino Mountains. Our club president, Carter Roberts, will receive his G. Bruce Blair Award. Alex Filipenko is the keynote speaker. There will be contests for home made telescopes, vendors from major optics manufacturers will be



there, demonstrating, selling, and promoting their wares. And, there will be hundreds of other amateur astronomers with their families. For all the details, go to their website at: <http://www.rtmcastronomyexpo.org/>. ★

◀ Main telescope field at RTMC



## Editor's News 'n Views

**Howdy, Astro Fans!** What's up? Well, as usual, all kinds of things. We've been looking at beautiful Saturn (see Conrad's picture of it on the next page). Remarkably, in just about 1.5 years, the rings will go edge-on, yet even now, we can

still easily make out the Cassini Division. In fact, looking at Saturn using the computer program, *Starry Night*, at 3am on December 31, 2008, high enough up above the eastern horizon for a good view, is about the best time to see Saturn *very close* to edge-on. Saturn will go *totally* edge-on later, on September 3, 2009, but it will be too close to the Sun to witness the event from Earth (on the ground, that is). It would be cool if they put the Hubble Space Telescope on it at that time. I hope they do.



As they do every year, the Chabot Space and Science Center held their **Volunteer Appreciation Night** to thank all the people who give of themselves and their time to help keep Chabot the world-class science center that it is. The event was catered, and the dinner and dessert was wonderful. We then broke up into groups to see and hear about the different areas where

Chabot uses volunteers to help teach and promote such things as solar observation, robotics, biology, recycling, alternative energy resources, and of course, astronomy. After that, we all attended a special presentation introducing us to CSSC's new Executive Director, **Alexander Zwissler**, who thanked the volunteers, personally, for their work. Mr. Zwissler is a Fairfax resident who was born in Germany, but grew up in Oakland, and fondly recalls looking at Saturn through Rachel's eyepiece when the observatory was still on Mountain Blvd. By remarkable coincidence, he attended the University of Leicester, England, which is where Chabot's previous director, **Alexandra Barnett**, also came from! Two Alexes in a row, from Leicester, England to become Director of the Chabot Space and Science Center. What're the odds of that?? To end of the evening with a flair, EAS member and CSSC staff member **Ryan Turner** treated the crowd to a remark-

able and entertaining planetarium show, specially made for the event—a one-time-only showing with music, humor, and eye-popping special effects produced in one of the world's most advanced and sophisticated planetariums. How nice!



Ken, Terry, & Paul reflecting on Maya's mirror

Astronomy Day this year was kind of a bust—it started out cloudy, and got worse from there. We had to end early because it began to rain. Well, we got *some* good promotion of astronomy, the EAS, and Chabot done in the short time we had. Better luck next year.

Nellie's and Maya's newly recoated mirrors are back from UC Santa Cruz' optics shop, and they look *pristine*, - quite a change from their previous, messed-up, state. *Thanks UCSC!!!*

**And that's it for now. Dark skies! ★**

### FUTURE CONJUNCTIONS—2007

NOTE: Please note there are TWO meetings in June. We are switching from having our General Meetings from the early to the later part of the month, and it was thought that it would be too much time between the June 3 and July 28 meetings.

- |     |       |   |
|-----|-------|---|
| May | 5     | General Meeting, Chabot, Physics Lab, 7:30pm        |
|     | 10    | Board Meeting, Chabot, Soda Board Rm, 7:30pm        |
|     | 20    | MOVN @ Chabot, Wightman Plaza*                      |
| Jun | 2     | <b>General Meeting, Chabot, Physics Lab, 7:30pm</b> |
|     | 14    | Board Meeting, Chabot, Soda Board Rm, 7:30pm        |
|     | 17    | MOVN @ Chabot, Wightman Plaza*                      |
|     | 30    | <b>General Meeting, Chabot, Physics Lab, 7:30pm</b> |
| Jul | 12    | Board Meeting, Chabot, Soda Board Rm, 7:30pm        |
|     | 22    | MOVN @ Chabot, Wightman Plaza*                      |
|     | 28    | General Meeting, Chabot Physics Lab, 7:30pm         |
| Aug | 9     | Board Meeting, Chabot, Soda Board Rm, 7:30pm        |
|     | 25    | General Meeting, Chabot, Physics Lab, 7:30pm        |
|     | (tba) | MOVN @ Chabot, Wightman Plaza*                      |
| Sep | 4-15  | Approx dates for Barcroft High-Altitude Star Party  |
|     | 13    | Board Meeting, Chabot, Soda Board Rm, 7:30pm        |
|     | 22    | General Meeting, Chabot, Physics Lab, 7:30pm        |
|     | (tba) | MOVN @ Chabot, Wightman Plaza*                      |
| Oct | 11    | Board Meeting, Chabot, Soda Board Rm, 7:30pm        |
|     | 27    | General Meeting, Chabot, Physics Lab, 7:30pm        |
|     | (tba) | MOVN @ Chabot, Wightman Plaza*                      |
| Nov | 15    | Board Meeting, Chabot, Soda Board Rm, 7:30pm        |
|     | 24    | General Meeting, Chabot, Physics Lab, 7:30pm        |
|     | (tba) | MOVN @ Chabot, Wightman Plaza*                      |

\*Members Only View Night:

Always call 510 482-2913 after 5pm to confirm

NOTE: Dates and times may change. We will provide as much advance warning as possible.

# Where to get away from it all

Story and photos by Gerald McKeegan

It takes less than nine minutes for the Space Shuttle to reach orbit from Kennedy Space Center in Florida. But if you are planning to visit Kennedy Space Center, you should plan on spending at least 12 hours there, spread over two days.

My family and I found this out in early April, when we went there expecting to do it all in one day. Fortunately, our plans were flexible enough to allow us to return the next day.

Kennedy Space Center (KSC) is located on 140,000 acres of wildlife refuge, within the Canaveral Natural Seashore. You don't appreciate this when you see news coverage of Shuttle launches, but when you look at aerial photos you realize that

KSC consists of half-a-dozen major work complexes separated by miles of wetlands and waterways.

The first stop on our visit was the KSC Visitor Center, 70 acres of museums, indoor and outdoor exhibits, simulations, and two gift shops.



*A real Saturn V rocket on display*

This is home to the outdoor rocket park, two Imax theaters, a shuttle mock-up, an astronaut memorial, and the boarding areas for the KSC and Cape Canaveral AFB bus tours.

For those who don't know, Kennedy Space Center is NASA's launch complex for human space missions -- Shuttle missions now, Apollo missions in the past, and, hopefully, Orion/Ares missions in the future. The adjacent Cape Canaveral Air Force Station is the launch complex for all unmanned commercial and government launches, and was the launch site

for early manned flights in the Mercury, Gemini and the beginning of the Apollo era.

You can choose between three bus tours. One is included with the regular admission, or you can pay extra for one of the two "up close" bus tours: one of KSC and one to Cape Canaveral.

We chose the KSC Up Close tour, which included a stop near Shuttle launch pad 39B and a stop at the Vehicle Assembly Building (VAB).

Even when you are standing right in front

of it, it's hard to grasp the truly massive size of the VAB. To help us get a sense of its size, the bus driver pointed to the large American flag painted at the top of the building and said, "Each of the stripes on that flag



is wide enough for me to drive this bus down it." Inside the VAB the Space Shuttle components -- the orbiter, the external tank, and the two solid rocket boosters -- are stacked and connected together prior to roll-out to the launch pad.

Before stacking in the VAB, the Shuttle orbiters are serviced and assembled in the Orbiter Processing Facility, a hangar size building with a specially cut door to fit the vertical tail of the orbiter. There are three OPF hangars adjacent to the VAB, but they seem like insignificant out-buildings compared to the size of the VAB.

This tour ends at the Apollo/Saturn V Center. This relatively new facility houses a full size Saturn V (refurbished and moved indoors from its old outdoor spot next to the VAB). It also is home to a fully functional reproduction of the original

Apollo Launch Control room, as well as a theater that replays the tense moments of the Apollo 11 landing on the moon, ending with a full size Lunar Excursion Module landing on the stage.



*Rocket Garden*

From the Apollo/Saturn V Center, we hopped onto another

bus and rode to the Int'l Space Station Processing Facility. Here we had a chance to walk through mock-ups of the Space Station modules (one of which looked like the one we had at Chabot back in 2000 and 2001). We also saw several real Space Station modules, and the European Columbus module.

The tour ended late in the afternoon at the Visitors Center, too late for us to do justice to the gift shops, so we had to go back the next day to stock up on souvenirs, and catch another IMAX movie.

I mentioned that the KSC was located in the middle of a wildlife refuge. During our tour, our bus driver would frequently stop or slow the bus to point out one of the special "guards" that augment the security force: alligators roaming freely in the ditches and bushes alongside the road. Even in this high-tech center of America's space program, Mother Nature reminds us who's in charge. ★

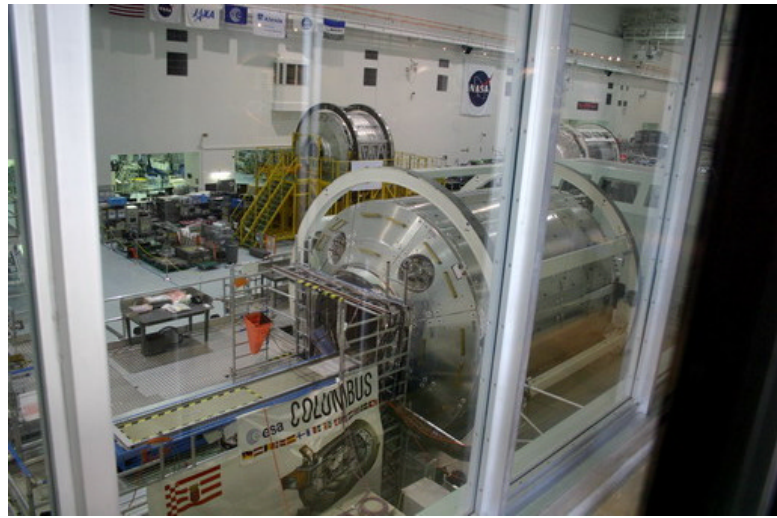


*Shuttle launch pad 39B*

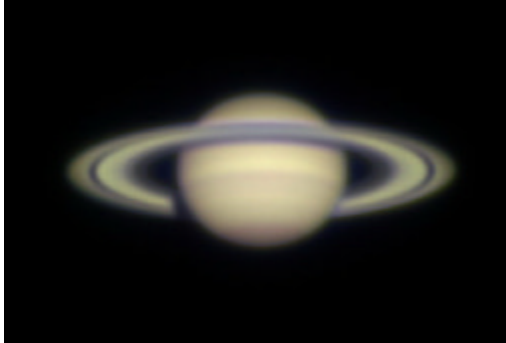
# Spare Shots



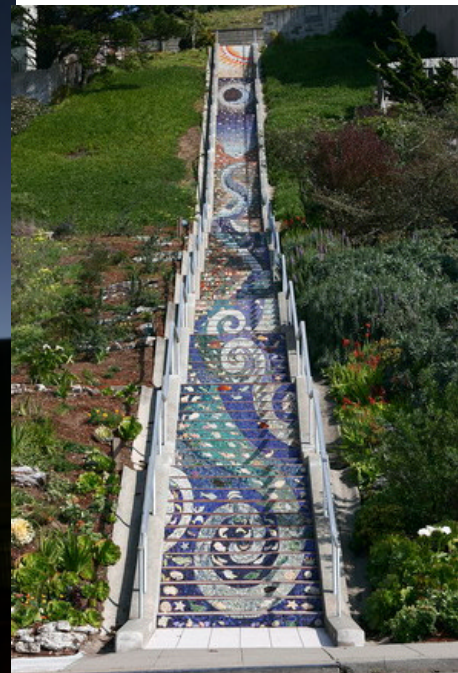
◀ *Firing Room, Launch Control recreated at the Kennedy Space Center in Florida. Photo by Gerald McKeegan*



▲ *The European Space Agency's Columbus space research module, to be added to the Int'l Space Station.*



▲ *Saturn, April 2007, by Conrad Jung*  
 ▼ *Carter doing a Chabot-to-Go outreach event at Stanley Middle School, Lafayette*



▲ *Carter noticed this urban artwork in S.F. at Moraga between 15th & 16th*




▲ *Carter catches a view of Venus above the crescent Moon from Wightman Plaza. Photo by P. Hoy*

◀ *Paul Hoy and Conrad Jung ▶*

*also at Wagner Ranch Elementary for a Chabot-to-Go Outreach Event.*

*And that's it for now! ★*





# Eastbay Astronomical Society

Post Office Box 18635 • Oakland, CA 94619-0635

**May 2007**  
RETURN SERVICE REQUESTED

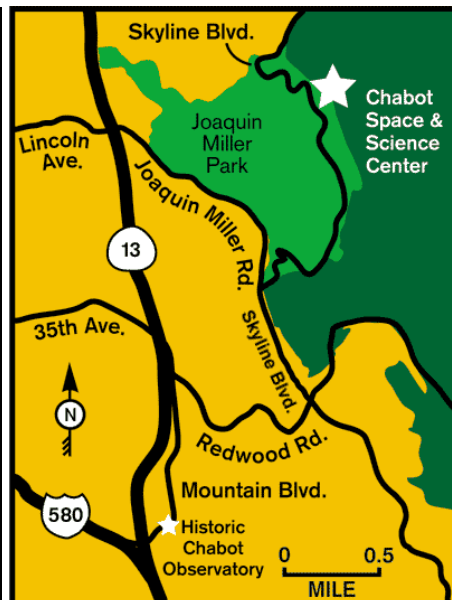
## Eastbay Astronomical Society

President: Carter Roberts (510) 524-2146  
Treas: G.McKeegan (925) 926-0853  
Secretary: Linda Lazzaretti (510) 633-2488

cwroberts@earthlink.net  
geraldspace@earthlink.net

Vice President: Paul Hoy (510) 531-6305 ahoy@aol.com  
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 June 2007 issue is May 15, 2007. 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.



### Join the Eastbay Astronomical Society

- Regular, \$24/year
  - Family, \$36/year
  - Contributing, \$40/year
  - Student, \$15/year (digital news-letter, only)
  - Sustaining, \$60/year or more
- Discounted Magazine Subscriptions:
- Sky & Telescope \$32.95 (order between July & December)
  - Astronomy \$34 (order between July & December)

#### Contact:

EAS Treasurer  
Post Office Box 18635  
Oakland, CA 94619-0635  
Telephone: (925) 926-0853  
Email: geraldspace@earthlink.net

**Sign up online at <http://www.eastbayastro.org/> (click on the Membership link for PayPal purchasing options)**