

The Refractor

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

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 April 2006

April 2006 talk:

New Horizons Mission to Pluto and Beyond

Saturday, April 8, 2006, 7:30 pm

Speaker: Dr. Dale Cruikshank of NASA/Ames

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

Our Speaker for the Saturday, April 08, 2006 meeting will be Dr. Dale Cruikshank of NASA/Ames. He will tell us about the exiting first mission to Pluto, and the exploration of the Kuiper Belt, beyond. The spacecraft was launched this January 19, traveling at the fastest spacecraft speed yet: 36,000 miles per hour (it's already past Mars orbit!) It will get to Jupiter in an amazing ONE YEAR; five times faster than any previous probe. At Jupiter, it will get an additional gravitational slingshot boost to 50,000 MPH, hurtling it onto the second leg of its nine year long voyage to Pluto, arriving July 2015. The New Horizons mission will then proceed on to explore the Kuiper belt of Icy Objects like Quowar, Sedna, and Xena. Some of the objects (planets? planetoids?) are larger than Pluto. Many of the objects it will explore are yet to be discovered!

The spacecraft is about the size and shape of a baby grand piano, weighing about 1,000 pounds and about 8 feet across. It has seven science instruments, including infrared and ultraviolet spectrometers for determining composition, plasma instruments, and a high resolution telescope that will finally reveal what mysterious Pluto and its moon Charon really look like. The encounter with the Plutonian system will last about a day. The spacecraft will whizz by Pluto at a speed of 27,000 mph and at a distance of only 6,000 miles and by Charon at 17,000 miles. The best pictures of Pluto will reveal features as small as 200 feet. The composition of Pluto and Charon's atmosphere and surface will be studied, and we hope to discover whether Pluto has rings or not! It will also study the two new moons of Pluto that have just been discovered! Most touchingly, New Horizons carries some of the ashes of Pluto's discoverer, Clyde Tombaugh, who spoke to EAS at our Annual Dinner in 1989. So you see, our speakers are not only out of this world, one of them will soon enough be out of this solar system!

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The New Horizons probe aboard an Atlas 5 rocket, lifts off from Kennedy Space Center in Florida on January 19, 2006 at 2pm EST

DINNER WITH THE SPEAKER

5:30 pm
 Saturday, April 8
HUNAN YUAN
 4100 Redwood Rd., #11
 (next to Safeway)
 Oakland
 (510) 531-1415
 No need to confirm—just show up!

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Planets in Strange Places

By Trudy E. Bell

Red star, blue star, big star, small star—planets may form around virtually any type or size of star throughout the universe, not just around mid-sized middle-aged yellow stars like the Sun. That’s the surprising implication of two recent discoveries from the 0.85-meter-diameter Spitzer Space Telescope, which is exploring the universe from orbit at infrared (heat) wavelengths blocked by the Earth’s atmosphere.

At one extreme are two blazing, blue “hypergiant” stars 180,000 light-years away in the Large Magellanic Cloud, one of the two companion galaxies to our Milky Way. The stars, called R 66 and R 126, are respectively 30 and 70 times the mass of the Sun, “about as massive as stars can get,” said Joel Kastner, professor of imaging science at the Rochester Institute of Technology in New York. R 126 is so luminous that if it were placed 10 parsecs (32.6 light-years) away—a distance at which the Sun would be one of the dimmest stars visible in the sky—the hypergiant would be as bright as the full moon, “definitely a daytime object,” Kastner remarked.

Such hot stars have fierce solar winds, so Kastner and his team are mystified why any dust in the neighborhood hasn’t long since been blown away. But there it is: an unmistakable spectral signature that both hypergiants are surrounded by mammoth disks of what might be planet-forming dust and even sand.

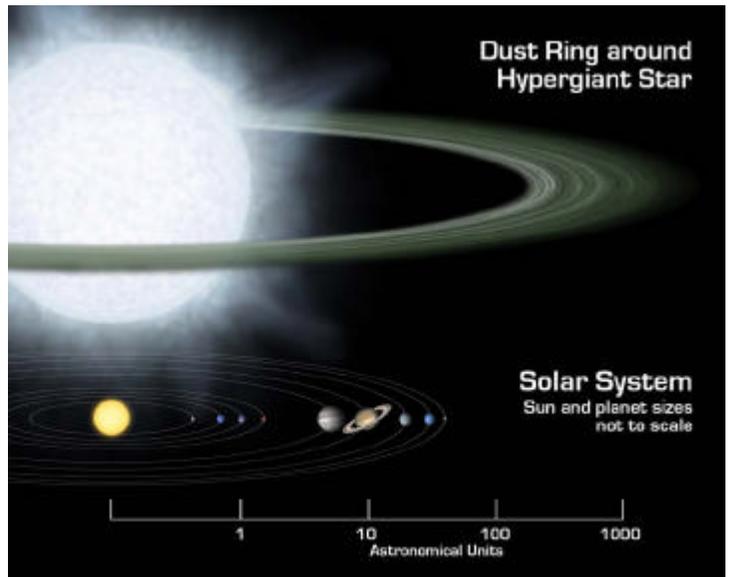
At the other extreme is a tiny brown dwarf star called Cha 110913-773444, relatively nearby (500 light-years) in the Milky Way. One of the smallest brown dwarfs known, it has less than 1 percent the mass of the Sun. It’s not even massive enough to kindle thermonuclear reactions for fusing hydrogen into helium. Yet this miniature “failed star,” as brown dwarfs are often called, is also surrounded by a flat disk of dust that may eventually clump into planets. (Note: This brown dwarf discovery was made by a group led by Kevin Luhman of Pennsylvania State University.)

Although actual planets have not been detected (in part because of the stars’ great distances), the spectra of the hypergiants show that their dust is composed of forsterite, olivine, aromatic hydrocarbons, and other geological substances found on Earth.

These newfound disks represent “extremes of the environments in which planets might form,” Kastner said. “Not what you’d expect if you think our solar system is the rule.”

Hypergiants and dwarfs? The Milky Way could be crowded with worlds circling every kind of star imaginable—very strange, indeed.

Keep up with the latest findings from the Spitzer at www.spitzer.caltech.edu/. For kids, the Infrared Photo Album at The Space Place (spaceplace.nasa.gov/en/kids/sirtf1/sirtf_action.shtml) introduces the electromagnetic spectrum and compares the appearance of common scenes in visible versus infrared light.



Artist’s rendering compares size of a hypothetical hypergiant star and its surrounding dusty disk to that of our solar system.

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

New Horizons Mission to Pluto and Beyond
Continued from front page

The spacecraft will then go on into the cold and lonely distant realms of the far solar system where it will fly by at least one and maybe more Kuiper objects that are in the 30 to 60 mile diameter range. It will try to determine their composition to see if they are similar or different from the wide variety of icy bodies in the deep Solar System.

Dr. Cruikshank is a Principal Investigator in the New Horizons mission, and one of the world’s leading experts (perhaps the leading expert) on the subject of the weird and wonderful icy objects that populate our Solar System. He is a co-discoverer of the very recently announced water geysers on Saturn’s moon, Enceladus. He has also been a leading scientist on a variety of planetary missions through the Solar System. He is now on the International Astronomical Union’s committee to resolve the highly contentious issue as to what is really a planet and to determine and redefine them in the context of the new Kuiper belt discoveries (lots of luck!). Most appropriately he is a former student of Dr. Gerard Kuiper, the discoverer of the Kuiper Belt. ★



NASA scientist, Dr. Dale Cruikshank

Where are YOU going in 2006?

Summer vacation is a good time to get out and do something different; to see something you haven't seen before (or at least don't get to see often). Some people go fishing, while others take the family to a theme park. If you're into baseball, you can tour famous and historic baseball stadiums. If you're into aviation, you can visit the Smithsonian Air and Space Museum in Washington DC. But, what do you do if you're interested in seeing the wonders of the universe? There is, of course, our annual club-sponsored trip to Barcroft in the White Mountains, but where can you go if you want to go further out, and see even more than just fantastic skies filled with deep-sky objects?

The answer: Leave the country! When asked for their recommendations, veteran globe-trotters Dr. Mike Reynolds and Carter Roberts voiced their preferences:

Southern Skies Astronomical Tours

I am quite familiar with Jen and Vic Winter and Astronomical Tours (as is Carter) who has run the Southern Skies Star Party for something like 11 years. About 40-50 people attend this incredible week on Lake Titicaca in Bolivia at an altitude of something like 12,000 feet. (Sounds a lot like Barcroft...)

You fly into La Paz, then transfer to the Inca Utama Hotel from there (about 45 minutes). The Hotel puts red filters on all exterior lights the week of the Star Party. The restaurant, right off of the observing area, has hot drinks and cookies out for observers.

In 2004, David Levy, Vic Winter and I were amazed to see the Milky Way easily cast a shadow, and in the still of the night we observed naked eye reflections of deep sky objects in Lake Titicaca! During the daytime we found, naked eye, Venus, Saturn and Mercury!! There were several of us -- including David -- who found these planets. We went through right around 90 Southern Hemisphere deep sky objects using a Meade 10-inch LX200. What a week! Plus I got in some simple astrophotography, binocular viewing, and occasionally some sleep.

I have had the pleasure of observing all over the world. And I am telling you -- no hype -- this is one of the premier sites! A week is not enough...

In addition the area is spectacular. And there are lots of optional field trips and things to do. Trust me on this one: you have got to put the SSSP on the top of your "to do" list.

The hotel basically turns itself over to the Star Party for the week. The cost is not too bad (about \$1,700 includes airfare from Miami, transfers, lodging and breakfast/dinner!) and I would highly, highly recommend it. See their website: www.sssp.org. (NOTE: The deadline to register for this year's trip ends on April 15th, 2006! It goes from July 22-29—Ed.)

*Keep Looking Up,
Mike*

Mike D. Reynolds, Ph.D.

Travel Quest

I have also gone on three eclipse trips (Turkey in 1999, southern Africa in 2001, and Australia in 2002) with TravelQuest (www.tq-international.com) and will be going to Libya with them for the eclipse next March. I can highly recommend them.

*Clear Skies,
Carter*

So, there you have it. If you go with either of these companies, or if you know of any others, let us know how it went. We'll spread the word. (Now, if I could just save my pennies to the tune of \$3,000, I'll have it made!) ★



Let's toot our own horn!

EAS Board Member Bruce Skelly came up with a pretty cool idea: gather up a "brag" list of anyone who received a major award, degree, title, had a minor planet

named after them, are some kind of celebrity, professional, etc., and post it on the club website. What a great idea! Such a list would help promote the club to the public, and give us a sense of our own history and worth.

Do you know any EAS member (past or present) whose name should go on such a list? If so, send an email, postcard, letter, call, or mention a name to any EAS club officer, and include the reason why you picked that person's name. If the person received an award from the EAS, you won't need to mention them for that (we've already got it), but if they've also received an award from any other astronomical or science-oriented organization, we could add that to the accolades for that person, too. And if you've received an award or are a famous or "astronomically" important EAS member, don't be modest—send in your own name! We don't care where the info comes from, we just want it!



Poked his head in

Note: we won't be interested in relatively small, or non-astronomical or scientific awards, such as "best tomatoes at the county fair," or even "Messier Marathon Completion" awards. But a G. Bruce Blair Award recipient would definitely count. Also, if the person is a pretty big celebrity, such as Albert Einstein (who popped his head into an EAS meeting, once) (does anyone have the specifics on this?), or Tom Hanks, who used to hang out at Chabot; they would count, too.

Let's brag a little. (E.g., did you know the EAS is the oldest, continuously operating astronomy club in the world?) Look to the EAS website in the near future for the list. ★



Editor's News 'n Views

Howdy, Astro Fans! It's official: this has been a phenomenally stinky month for doing any kind of (local) stargazing at all. According to the National Weather Service, we beat the record for number of rain days in March since 1904; it was 23, now it's

24 – 24 days of rain in a single month! (Is it *The Day After Tomorrow*, yet?) (That's a joke, son; for those of you who don't know, *The Day After Tomorrow* is a movie about worldwide disasters caused by global warming.) (I never said it was a great joke.) Although I think we can safely proclaim this is as not being a drought year, it wasn't so good for a Messier marathon, either.

Well, it happened just like they said it would, and some of us even got to see it in person. The total solar eclipse of 2006; its path crossed the Atlantic, made landfall in Africa, sa-shayed through the Middle East, and ended up in central Asia. Several EAS members went to go see it in various locations; Carter (of course) went to Libya, and Debbie Dyke, and Ryan Turner (and probably a few others) went to Turkey to see it. Cool! For the event, Chabot linked-up with The Exploratorium to pipe a live feed in from Side, Turkey, and projected it up on the planetarium dome during the wee hours of the night. Here's an email message from Carter received the day of the eclipse:

Greetings from the middle of nowhere. We are about 100 km from anything yet the local telecom set up a free wireless hotspot at the eclipse camp. We saw a very beautiful eclipse with a very elongated corona. Clear



Totality from Libya - C. Roberts

Skies, Carter. And, Debbie Dyke reported: What a wonderful eclipse it was! Perfect weather, perfect everything. Took some pictures, but tried to mostly just gaze at it. Lovely streamers--it was a bow-tie effect of two on each side (at least two prominent ones on each side). We will no doubt cop a vicarious thrill or three from their pictures and stories in the not-too-distant future, so feel free to keenly anticipate; I know I will.



It was kind of a light month for outreach star party events, what with all the rotten weather, but between the downpours, we did manage to squeeze one nice, small one in at Roosevelt School in San Leandro. Dave As-

troWizard™ Rodrigues arranged and organized it, and Ray Wong, Bob Gross, and myself brought our scopes along for the fun, too. We wowed the kids with views of Saturn, the Orion Nebula, double-stars, satellites, constellations, and green laser pointers. It was fun.

Mark you calendars! Coming to a clear sky near you, Near Earth Object, Comet 73P/Schwassmann-Wachmann 3, will be in Cygnus and Pegasus on May 12 – 14 at 3rd or 4th magnitude (binoculars will be a big help). It has already broken up into 3 pieces, and is expected to continue doing so. It makes a fairly close pass to the Earth, about 6 million miles (roughly 24 times the distance between the Earth and the Moon), but the dust from it's debris trail will only make a minor meteor shower in 2022.

LBNL (Last But Not Least, not Lawrence Berkeley National Laboratory), our Annual Awards Dinner was a big success, with over 70 attendees, a great talk from an amazing man of science, and food so good, you had to have a will of steel to not completely stuff yourself. As such, there were a lot of stuffed people there, that night. If you missed Dr. Townes' talk on science and religion, we can arrange a secondary viewing of it, as it was videotaped (thanks Paul and Regg) for one of our members who wasn't able to attend that evening .



Nobel laureate, Dr. Charles Townes at the EAS Annual Awards Dinner, 2006
Photo by D. Saito

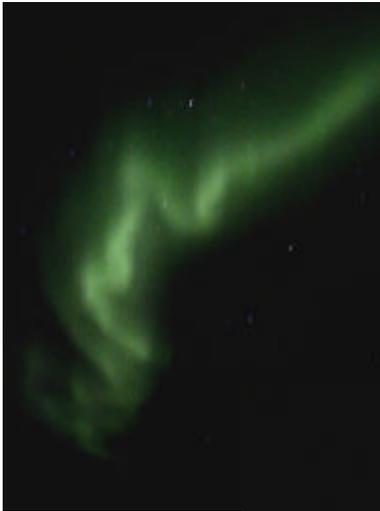
That's it for now. Dark skies! ★

Upcoming Events

For the outreach events, we can always use more volunteers to operate the scopes, run demos, hand out literature, answer questions, provide security (watch our stuff for bathroom breaks), and share in the fun! Contact any club officer for more information.

- 4/30 (Sun evening)—April MOVN (Members Only View Night) at Chabot's Wightman Plaza. Call (510) 482-2913 after 5pm to confirm
- 6/5 (Sun evening)—June MOVN
- 6/28 (Wed evening)—EAS Astro outreach event for the American Assn of University Women, Tech Trek Camp, Mills College
- 8/26 & 27 (Sat/Sun daytime)—EAS/Chabot outreach event at Oakland's Chinatown Streetfest, 2006

Spare Shots ★



◀Greetings from London, Attached is an image taken over northern Canada. It is one of a bunch I took during a beautiful display that went off and on for almost three hours. This was especially bright so only required a 5 second exposure. Photo by Carter Roberts



▲Bill Drelling captures some ghostly writing at a club astrophoto session at Chabot.

▶Bill Drelling also captures the star trails of Orion above the Dellums Bldg at Chabot.

▶Ray Wong at the Roosevelt School in San Leandro shows the kids Saturn with his 5" Meade refracting telescope



◀Nobel laureate Charles Townes, speaker at the 2006 EAS Annual Awards Dinner.



◀Lucy Olsen ducks so Carter can hand off a 2006 Astronomical Calendar to door prize winner and event speaker Dr. Charles Townes.

▲Dave Rodrigues demonstrates the power of a telescope by pointing it down the street at the Roosevelt School star party.

▶Conrad uses the 20" refractor, Rachel, to capture an image of Saturn.



▶Carter gives Cheryl Schudel her Binocular Messier Award Certificate as issued by the Astronomical League. Way to go, Cheryl!

And that's it for now! ★





Eastbay Astronomical Society

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

April 2006
RETURN SERVICE REQUESTED

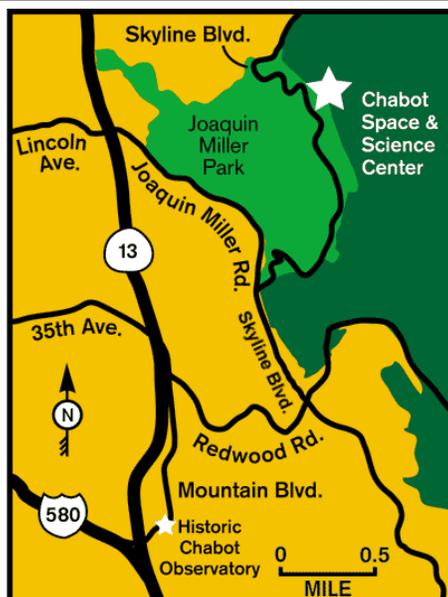
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Articles and photos for *The Refractor* are encouraged. Deadline for the May 2006 issue is April 22, 2006. Items may be submitted by mail to:
Editor - 3514 Randolph Avenue, Oakland, CA 94602-1228. Internet email address: donsaito@comcast.net Hm: (510) 482-2913.



FUTURE CONJUNCTIONS

- Apr 2 Members Only View Night @ Chabot*
 - 8 General Meeting, Chabot, Physics Lab, 7:30pm
 - 13 Board Meeting, Chabot, Soda Board Rm, 7:30pm
 - 30 Members Only View Night @ Chabot*
 - May 11 Board Meeting, Chabot, Soda Board Rm, 7:30pm
 - 13 General Meeting, Chabot, Physics Lab, 7:30pm
 - ?? Members Only View Night @ Chabot (to be announced)
- *Call 510 482-2913 after 5pm to confirm

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 Treasurer
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