

PRIMEFOCUS

Tri-Valley Stargazers

May 2007



Meeting Info:

What

Searching for ET Life in the Solar System

Who

Dr. Margaret Race

When

May 18, 2007
Doors open 7:00 p.m.
Lecture at 7:30 p.m.

Where

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

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May Meeting

Dr. Margaret Race

Searching for ET Life in the Solar System: Astrobiology, Planetary Protection and Mars Missions

Get an unusual behind the scenes view of Astrobiology, space mission planning and Mars exploration. Policies under the Outer Space Treaty require that NASA consider Planetary Protection on every mission to Mars—with surprising requirements and impacts on the spacecraft, equipment—and someday even humans when they venture onto the Red Planet. It takes more than rocket scientists and planetary scientists to do it right!

Dr. Margaret Race is an ecologist currently working with NASA through the SETI Institute in Mountain View, CA. Her current work focuses on planetary protection, legal and societal issues, risk communication and education related to solar system exploration, astrobiology and the search for extraterrestrial life. Over the past decade, she has served on numerous NASA and National Research Council (NRC) studies of forward and back contamination associated with missions to Mars and other celestial bodies. She was an organizer and editor of a series of international workshops on containment and testing protocols for Mars sample return missions and was involved in several recent studies of planetary protection for human missions to Mars. Dr. Race is also actively involved in science education and public outreach about astrobiology through schools, museums, and presentations for general audiences.

Dr. Race received her BA degree (Biology) and MS degree (Energy Management and Policy) from the University of Pennsylvania, and her Ph.D. in Ecology from the University of California at Berkeley. Her past positions include teaching and research at Stanford University (Human Biology Program), Assistant Dean at UC Berkeley (College of Natural Resources), and Senior Science Policy Analyst at University of California Office of the President. She was also a Postdoctoral Fellow in Marine Policy and Ocean Management at Woods Hole Oceanographic Institution, a Public Information Specialist with the US EPA, and AAAS Mass Media Fellow at KQED-TV in San Francisco.

She works behind the scenes with NASA on planetary protection—how to plan space missions in ways that ensure environmental protection while exploring on Earth and in the solar system.

During the past decade, she has been involved in numerous national and international studies analyzing planetary protection issues for both robotic and human missions to Mars.

She's been an East Bay resident since the mid-1970's, and has been active in science enrichment as a volunteer in many local and regional schools and programs

News & Notes

2007 TVS Meeting Dates

The following lists the TVS meeting dates for the next few months. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month's issue (e.g., the June 3rd deadline is for the June issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
May 18	May 21	May 6
June 15	June 18	June 3
July 20	July 23	July 8

Money Matters

Treasurer **David Feindel** reports the TVS account balances (as of April 20, 2007):

Checking	\$4,031.77
CD #1	\$3,605.29
CD #2	\$2,548.14

matures 05/17/07
matures 05/27/07

Correction

In last month's issue of Prime Focus (and on the web site for a while), the first TVS Open House was mistakenly listed as Saturday, June 8th. It should have read Saturday, June 9th.

Club Star Party Trips

As mentioned in last month's newsletter (and corrected above), we have the dates for the various club star parties.

The H2O Open House nights are on Saturday, June 9th and Saturday, July 7. We'll meeting at the corner of Mines and Tesla to caravan down to the site (an hour's drive away). Check the TVS web site for meeting times.

Next up is the Yosemite Star Party at Glacier Point. We'll be there Labor Day weekend (August 31st through September 2nd). In exchange for putting on a public star party for park visitors at Glacier Point, members get free park entrance, camping at the Bridalveil Campground, and continued observing at Glacier Point.

The White Mountain/Barcroft trip follows right after, from September 4th through the 15th, with a final departure date of the 16th. Barcroft is a high altitude research station located at 12,400' elevation with good food and dark skies. The cost is \$63 per person per day (must be over age 16, due to the altitude), which includes room and board. Attendees can choose how many days they would like to stay at Barcroft.

If you need more information, or want to sign up for the Yosemite and/or White Mountain trip, contact **Dave Rodrigues** at 510-483-9191.

School Star Party

We've been invited to participate at the third annual Space Night GATE social event at the Leo R. Croce Elementary School. The event takes place on Thursday, May 24th, from 6:30 to 8:30 p.m.

There will be exhibits, an indoor planetarium, a speaker from NASA Ames, and a number of space-related hands-on activities for students. A member of LUNAR will display his model rockets, and of course, we'll be there with scopes. The past two years have brought over 400 attendees, and so far 150 have RSVPd.

Leo Croce is located at 5650 Scenic Avenue in Livermore, just a couple blocks down (south) and to the west of the TVS lecture meeting location.

Although it will still be fairly light, we should be able to view the Sun, waxing gibbous Moon, Venus and Saturn.



Saturn as seen on March 22, 2007. Saturn's rings will appear edge on to us in the latter half of 2009. However, Saturn will be up during the day so we won't be able to see the rings edge on.

This image was taken with a digital camera in conjunction with a x2 barlow lens with an extension tube, and Rachel, the 20-inch refractor at the Chabot Space and Science Center in Oakland.

169 images were used to produce the image, each at 1/15 exposure at ISO 400. No filters were used. The multitude of images were stacked in Registax, and the final image processing was done in Photoshop. *Photo: Conrad Jung*

Newsletter header image: The Crater Copernicus.

Copernicus is one of the larger craters visible to us here on Earth. The crater is 60 miles in diameter, 2 miles deep, with 3,000 foot cliffs. The peaks near the center of the crater form a mountain range about 10 miles long and 2,000 feet high. The crater is estimated to be 800 million years old.

The picture was taken with Rachel, Chabot's 20-inch refractor, and a Canon 20D digital camera. The exposure was 1/15 second at ISO 200 and there were 292 frames stacked. The image is oriented so that North is to the right.

Photo: Conrad Jung

Calendar of Events

May 18, 8:00 - 11:00 p.m.

What: *Lunar Lounge Express*
Who: You
Where: Chabot Space & Science Center, Oakland
Cost: Lunar Lounge: \$15 Adult, \$10 Student, \$8 Member
Lunar Lounge + Mission: \$23 Adult, \$18 Student, \$16 Member.
Space is limited! Call the Box Office at 510-336-7373 for reservations.

Bring your friends and come party under the stars at Chabot's monthly nocturnal celebration—The Lunar Lounge Express!

The Lunar Lounge Express

Featuring live music, refreshments, activities and fun! The Lunar Lounge Express gives you full access to the Chabot Space & Science Center's interactive exhibits and includes the Planetarium program SonicVision (a new alternative music show), as well as telescope viewing at the Observatory Complex. Musical entertainment is Antioquia—art rock filled with world rhythms.

You can purchase food from the Celestial Café, and enjoy \$3 micro-brews from Buffalo Bill's Brewery and \$3 wine from the cash bar.

For an additional \$8 you can add a Space Mission!

Comet Collision

Don't miss your chance to embark on a daring exploration of comets aboard the C.L.C. Spacecraft! The mission's objective is to plot a course to rendezvous with a comet and launch a probe to collect scientific data. Drinks will be served during the mission briefing. To complete your mis-

sion, your team of astronauts must overcome any unforeseen challenges and unexpected emergencies. The Mission lasts for one hour.

May 19, 8:30 p.m.

What: *Stardust Mission*
Who: Dr. Scott Sandford (NASA Ames)
Where: Mt. Tam Mountain Theatre
Cost: Free

Dr. Sandford will give an overview of the Stardust Mission and an update on what has been learned from the comet sample it returned to Earth from Comet 81P/Wild2.

Weather permitting, the talk will be followed by observing in the Rock Springs Parking Lot, with the San Francisco Amateur Astronomers.

This a FREE program, sponsored by Mt Tamalpais State Park, open to the general public. Student and youth groups are encouraged to attend.

Dress warmly, bring a flashlight and car pool if possible. More information and directions are at www.mttam.net. If the weather is questionable that day call the hotline 415-455-5370 after 3:00 p.m. for an update.

May 19, evening

What: *International Sidewalk Astronomy Night*
Who: Everyone
Where: A sidewalk near you
Cost: Free

Engage the public by taking telescopes to the sidewalk, honoring John Dobson. More info and to announce your location: <http://home.earthlink.net/~sidewalkastronomynight>.

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Lecture Meeting:

Unitarian Universalist Church
1893 N. Vasco Road, Livermore

Board & Discussion Meetings:

Round Table Pizza
1024 E. Stanley Blvd., Livermore

Web & E-mail

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Eyes on the Skies

Eyes on the Skies is a robotic solar telescope run by Mike Rushford (rushford@eyes-on-the-skies.org). You may access it by visiting www.eyes-on-the-skies.org.

TVS E-Group

So how do you join the TVS e-group you ask? Just send an e-mail message to the TVS e-mail address (tvs@trivalleystargazers.org) asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.

Astro Events



NGC 4486 (M87) and the center of the Virgo Galaxy Cluster.

The image was taken with a 200mm f/4 telephoto lens with an ST10XME CCD camera, and is about 105 minutes of exposure time. For a larger view, visit http://www.trivalleystargazers.org/gert/CCD_Gallery/ngc4486_st10xme_200mm.html. *Photo: Gert Gottschalk.*



Jupiter. This picture is a combination of 103 images. The image was taken in February 2006 using the 20" refractor, Rachel. *Photo: Conrad Jung*

Jupiter Transits

The following are a few listings of transit times for various Jupiter related objects. The abbreviations are fairly straight forward: G=Ganymede, C=Callisto, I=Io, E=Europa, GRS=Great Red Spot, and if you see a 's' next to one of the moons, it means its shadow (e.g., Cs=Callisto's shadow); na means Jupiter is below the horizon or it is daylight at that time.

May

Fri 11	GRS	na	10:30p	12:30a
Sun 13	GRS	2:30a	4:30a	6:15a
Fri 18	Is	na	na	10:45p
	I	na	10:06p	11:12p
	GRS	na	11:17p	1:17a
Sun 20	GRS	11:17p	12:55a	2:40a
Fri 25	GRS	10:10p	11:35p	12:40a
	Is	10:30p	11:48p	12:55a
	I	10:45p	12:00a	1:55a

June

Fri 1	Gs	na	10:07p	11:10p
	G	9:23p	10:20p	11:28p
	GRS	10:52p	12:47a	2:47a
Sat 2	Is	12:24a	1:30a	2:35a
	I	12:29a	1:34a	2:40a

Calendar of Events *continued*

May 22, 6:00 p.m.

What: *Searching for Life Beyond Our Solar System*

Who: Dr. Victoria Meadows (NASA)

Where: A teleconference from the comfort of your own home

Cost: Free

Dr. Victoria Meadows is currently the lead scientist at NASA's Virtual Planetary Laboratory and will share her research on how we are trying to detect life outside our solar system. Join us on May 22nd for this fascinating teleconference!

Whether the universe harbors other worlds that can support even simple life is a question that has been pondered, yet has remained unanswered, for over two thousand years. Over the next two decades, NASA will launch a series of spaceborne telescopes that will search for Earth-sized planets around other stars and examine those planets for signs of life. But which observations should we make? And what should we look for?

This talk will explain how we will search for and identify planets that might support life around other stars, and describes results from the new science of astrobiology that will help us recognize signs of life on these distant worlds.

If this is your first Teleconference, here is how it works. After May 15th, you will be able to download or view a PowerPoint presentation on the Night Sky Network website. On May 22nd, members across the country call the number below and listen as Dr. Meadows gives her talk. (This teleconference is offered for member clubs in the Night Sky Network, not the general public.) She will guide us through the slides in the PowerPoint as she goes. Participants are then encouraged to ask Dr. Meadows questions. This will be recorded and posted on the Night Sky Network website. It can then be downloaded for future use.

To join the Teleconference *Searching for Life Beyond our Solar System* by Dr. Victoria Meadows, call in on Tuesday, May 22nd, to the toll-free conference call line: 1-800-779-8164. Call anytime after 5:45 p.m. on the evening of the telecon. An operator will answer and:

You will be asked for the passcode:

NIGHT SKY NETWORK

You might be asked for the call leader:

MICHAEL GREENE

You will be asked to give your NAME and the CLUB you belong to, and number of people listening with you.

If you have any questions or are having any difficulties logging into the Night Sky Network (<http://nightsky.jpl.nasa.gov>), send an email to nightskyinfo ~at~ astrosociety ~dot~ org.

May 23, 7:00 p.m.

What: *A Ringside Seat to the Birth of Planets*

Who: Dana Backman (SETI Institute)

Where: Smithwick Theater

Cost: Free (parking is \$2 in quarters)

Astronomer Dana Backman of the SETI Institute will give a non-technical, illustrated talk on *A Ringside Seat to the Birth of Planets* as part of the Silicon Valley Astronomy Lectures in the Smithwick Theater, Foothill College, El Monte Road and Freeway 280, in Los Altos Hills, CA.

No background in science will be required for this talk. Call the series hot-line at 650-949-7888 for more information and driving directions.

Astronomers have discovered dusty "doughnuts" of cosmic raw material around many younger stars. In some cases, astronomers can see tantalizing hints in the rings that planets may be forming or may already have formed from this material.

Dr. Backman will explain how new kinds of telescopes and observations are thus making it possible for us to detect the birth process of planets around nearby stars. He'll discuss how some of these structures remind us of the asteroid belt in our own solar system and the rings of icy chunks beyond Neptune that we call the Kuiper Belt.

Dr. Backman will conclude by previewing future observations of these intriguing dusty rings with new telescopes, particularly the SOFIA (Stratospheric Observatory for Infrared Astronomy) Project in which NASA has outfitted a 747 plane with a special telescope that can observe heat-rays from distant objects. The talk will be illustrated with images of and by some of the most advanced telescopes in the world.

Dr. Backman has been both a research astronomer (specializing in infrared observations) and a widely praised teacher of astronomy. He is the manager of education and outreach for the SOFIA Project and is much in demand as a public speaker on topics on the frontiers of astronomy.

The lecture is co-sponsored by the NASA Ames Research Center, Foothill College Astronomy Program, SETI Institute, and the Astronomical Society of the Pacific.

June 4, 7:30 p.m.

What: *Cosmic Jackpot*

Who: Dr. Paul Davies (Arizona State University)

Where: Jewish Community Center, San Francisco

Cost: \$4.00 at the door or by mail

Scientists have long known that the universe is so well suited for life it looks like a fix. How can we explain this? Are we winners in a cosmic lottery of co-existing universes? Using recent scientific discoveries and radical thought

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What's Up *by Debbie Dyke*

All times Pacific Daylight Time.

May

- 9 Wed **Last Quarter Moon.** 9:27 p.m.
10 Thur 1969 Apollo 10 crew transmit the first color pictures of the Earth from space.
13 Sun Mother's Day.
15 Tue Moon at perigee (222,821 miles). 8:00 a.m.
Look for Mercury low in the west after sunset.
16 Wed **New Moon.** 12:27 p.m.
1969 Venera 5 impacts Venus.
17 Thur The 1.5 day old Moon is 2.5° north of Mercury in the evening twilight. 8:00 p.m.
1969 Venera 6 impacts Venus.
18 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,
1893 N. Vasco Road, Livermore.
1910 Earth passes safely through tail of Comet Halley.
19 Sat The thin crescent Moon is just 1.5° from Venus in the early evening sky.
20 Sun **Tri-Valley Stargazers discussion meeting.** 2:00 p.m. at the Round Table Pizza on 1024
E. Stanley Blvd., Livermore. Discuss astro stuff with your fellow members.
21 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza in Livermore.
First Quarter Moon. 2:03 p.m.
22 Tue The Moon is 5° south of Saturn in the evening.
23 Wed 1980 The Tri-Valley Stargazers become incorporated as a non-profit organization.
25 Fri Start of RTMC-Riverside Telescope Makers Conference.
27 Sun Moon at apogee (251,385 miles). 3:00 p.m.
The Moon is 2° from the bright star Spica. 10:00 p.m.
28 Mon Memorial Day.
1959 First primates in Space—Able and Baker.
29 Tue 1919 Einstein's theory of general relativity is tested for the first time during a total solar eclipse.
30 Wed 1966 Surveyor 1 makes the first soft landing on the Moon.
31 Thur **Full Moon.** 6:04 p.m.
The Moon is 6.5° south of Jupiter. 11:00 p.m.
1935 Robert Goddard's rocket reaches 7,500'.

June

- 1 Fri 1858 Lick Observatory dedicated
2 Sat 1858 G. Donati at Florence, Italy discovers one of the comets of the century, named Donati's Comet
in his honor.
3 Sun 1948 Dedication of the 200-inch Hale telescope at Palomar. Full time use of the scope doesn't take
place until the following January.
4 Mon 1965 Ed White becomes first American to walk in space. His walk lasted 22 minutes.
6 Wed The Moon 3.5° north of Neptune. 3:00 a.m.
8 Fri **Last Quarter Moon.** 4:43 p.m.
Uranus 1.5° south from the Moon. 4:00 a.m.
1625 Giovanni Cassini born.

Clouds from Top to Bottom

by Patrick L. Barry

During 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 weeks 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."

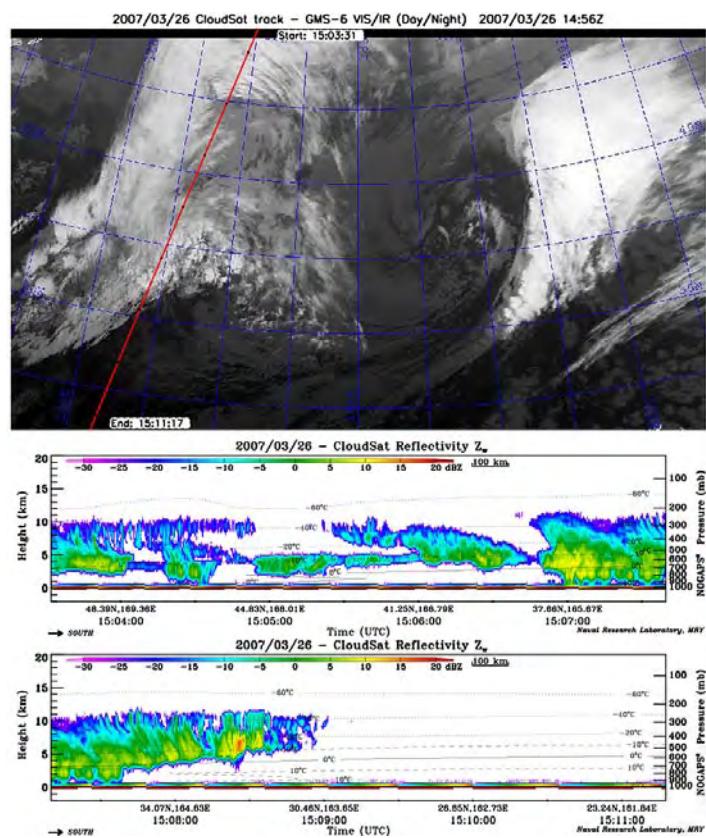
There is an archive of all data collected since the start of the mission in May 2006 on the CloudSat QuickLook website at cloudsat.atmos.colostate.edu. And to introduce kids to the fun of observing the clouds, go to spaceplace.nasa.gov/en/kids/cloudsat_puz.shtml.

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

Calendar of Events *continued*

about the cosmos—Davies discovers a more subtle process at work.

All programs begin at 7:30 pm in Kanbar Hall at the Jewish Community Center of San Francisco, 3200 California Street. Parking is available across the street in the UCSF Laurel Heights campus parking lot for \$1.25 per night. Parking in the JCC garage is \$1.25 per half-hour. For more information, call 415-321-8000.



A CloudSat ground track appears as a red 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) shows a vertical cloud profile far more complex than the two-dimensional GMS-6 imagery would suggest. Thicker clouds and larger droplets are shown in yellow/red tones, while thinner clouds are shown in blue.

Tri-Valley Stargazers
P.O. Box 2476
Livermore, CA 94551



PRIMEFOCUS

Tri-Valley Stargazers Membership Application

Member agrees to hold Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function.

Name _____ Phone _____ e-mail _____

Address _____

Do not release my: _____ address, _____ phone, or _____ e-mail information to other TVS members.

Membership category: _____ \$5 Student.

_____ \$30 Basic. You will receive e-mail notification when the PDF version of *Prime Focus* is available for download off the TVS web site.

_____ \$40 Regular. You will receive a paper version of *Prime Focus* in the mail.

_____ \$32.95 One year subscription to *Sky & Telescope* magazine.

_____ \$34 One year subscription to *Astronomy* magazine.

_____ \$60 Two year subscription to *Astronomy* magazine.

_____ \$10 Hidden Hill Observatory (H2O) yearly access fee. You need to be a key holder to access the site.

_____ \$20 H2O key holder fee. (A refundable key deposit—key property of TVS).

_____ \$40 Patron Membership. Must be a member for at least a year and a key holder.

\$ _____ Tax deductible contribution to Tri-Valley Stargazers.

\$ _____ TOTAL – Return to: Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551

Membership information: Term is one calendar year, January through December. Student members must be less than 18 years old or still in high school.