PRIMEFOCUS

Tri-Valley Stargazers

February 2004

TVS
Tri-Valley Stargazers

Meeting Info:

What
Galaxies Near and Far

Who
Bryan Mendez

When
February 20, 2004
Conversation at 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

February Meeting

Galaxies Near and Far

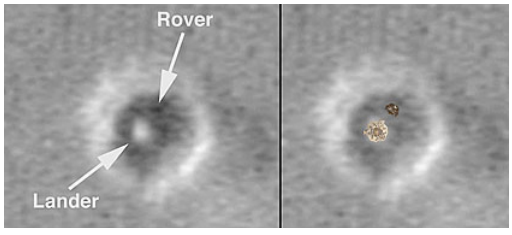
Bryan Mendez

How can we tell how far galaxies are from us? A Cepheid Variable is a star whose intrinsic or true brightness is known, and because of this we can accurately determine distances by measuring how faint they are (the further they are away, the dimmer they appear). However, not all galaxies have Cepheid Variables in them. Another method can be used, called Tip of the Red Giant Branch (TRGB), and is what our speaker will tell us about in his talk.

Bryan Mendez is an Education and Public Outreach Scientist at the Center for Science Education at UC Berkeley's Space Sciences Laboratory. Supported by NASA Space Science Missions, he works to improve science education and literacy. Born in Traverse City, Michigan, Bryan attended Traverse City Senior High and was an active musician, playing the saxophone in several different bands. He then attended The University of Michigan and received two degrees: a BA in Musical Arts, and a BS with honors in Astronomy and Astrophysics, with a concentration in general physics. In 1997, Bryan moved to California to study Astronomy and Astrophysics at UC Berkeley, and continues his studies to this day. He's also a Project Astro participant, and was a graduate student astronomy instructor, because astronomy is a great passion for him and he just loves to teach it.

Rovers Are Roving

In case you've been in a cave for the last month, NASA has successfully landed two rovers on Mars. After some glitches, Spirit is back in prime working form and is traversing Gusev Crater. Opportunity is checking out the Martian bedrock for what secrets it may reveal. For all the latest info, and pictures galore, go to the Mars rover web site: www.marsrover.nasa.gov.



Opportunity's landing spot. This image was taken by the Mars Global Surveyor. On the right are tiny computerized lander and rover images to clarify what's seen on the left image.

News & Notes

Welcome

TVS welcomes our newest members to the club — **Steve Goldenberg**, **Hilary Jones** and **Robert Bariteau**.

2004 TVS Meeting Dates

Below are the TVS meeting dates for the first part of the year. The lecture meetings will continue to be 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 March 7th deadline is for the March issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
Feb. 20	Feb. 23	Feb. 8
Mar. 19	Mar. 22	Mar. 7
Apr. 16	Apr. 19	Apr. 4

Money Matters

At the January Board meeting, Treasurer **Gary Steinhour** gave us the account balances (as of January 19, 2003) of TVS's accounts:

Checking	$1,704.71	
CD #1	$3,924.52	matures 02/17/04
CD #2	$2,421.97	matures 02/27/04
CD #3	$2,066.49	matures 04/16/04

Dues Are Really Due!

If you haven't already, now's the time to renew your membership (our membership year runs from January to December).

The membership categories remain at Student–$5, Basic–$25, and Regular–$30. The only difference between the latter two is that the Basic membership will access the newsletter online, the Regular membership will get a paper version sent to them in the mail.

For the few of you who are Patron Members, your Patron status will be renewed automatically. At this time, since the Marling scope is still unoperative we will not be collecting a Patron Membership fee.

TVS E-Group

So how do you join the e-groups you ask? In short, 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.

Chile Tours

TVS received the following e-mail and thought that it looked promising. If enough people are interested, we might try to organize a trip through this group.

QuasarChile Announces:

Expert guided tours to Northern Chile designed for amateur astronomers are now available.

* Indulge your passion to visit one of the planet's premier observatories.
* Observe the Magellanic Clouds and the star clusters of the inner Milky Way through the darkest, clearest skies on Earth.
* Enjoy the outstanding natural beauty of Chile's northern deserts, volcanoes, and coastal regions.

We offer these personalized tours at affordable prices. Our tour of almost virgin Atacama highlands is an unforgettable experience that will provide you with an appreciation for the unique qualities of this remote part of northern Chile.

Please visit our web site at: http://www.quasarchile.cl for more details.

Sincerely,
QuasarChile, Luis Campusano, PhD

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Calendar of Events

Classic Sci-Fi Film Series
Chabot Space & Science Center

The movies are shown in their original theater format at the 60' Tien MegaDome Theater. Tickets are $5 per person and are available at the door, at TicketWeb.com, or the Chabot Box Office, 510-336-7373.

Movies:
At press time the movie schedule hadn't been released. Visit www.chabotspace.org/visit/theater.asp for movie listings.

Showtimes:
Friday – Sunday on the first weekend of each month.
Friday & Saturday – 7:30 p.m., Sunday – 4:00 p.m.

Newsletter header image: Meridiani Planum
This outcropping lies to the northwest of the crater Opportunity landed in. These layered rocks measure only 10 centimeters (4 inches) tall and are thought to be either volcanic ash deposits or sediments carried by water or wind. Data from the panoramic camera's near-infrared, blue and green filters were combined to create this approximate, true-color image. *Photo: Opportunity*

Calendar of Events *continued*

February 21, 6:30 p.m.
What: *Teaching Robots to Read the Lay of the Land on Strange New Worlds*
Who: Dr. Ayanna Howard
Where: Chabot Space & Science Center, Oakland
Cost: $5

Mapping human intelligence is enabling the new generation of rovers to analyze terrain and decide, just as human pilot would, where to land. Dr. Howard will talk about artificial intelligence and her work at NASA's Jet Propulsion Laboratory to create intelligent technology for space applications.

March 6, 6:30 p.m.
What: *Biocosm — The New Scientific Theory of Evolution: Intelligent Life Is the Architect of the Universe*
Who: James N. Gardner
Where: Chabot Space & Science Center, Oakland
Cost: General: $11 Adults & $8 Senior, Members: $8 Adults & $5 Senior

Complexity theorist James N. Gardner will speak about his groundbreaking theory that life and intelligence have not emerged in a series of random Darwinian accidents, but are hardwired into the cycle of cosmic creation, evolution, death, and rebirth. Gardner proposes that our universe has been deliberately engineered to promote life and intelligence and, in fact, requires life and intelligence in order to mediate the reproduction of the cosmos after the Big Crunch. Book signing will follow lecture.

News & Notes *continued*

Star Parties

The Vintage Hills school star party scheduled for January had to be postponed due to bad weather. As soon as a new date is set, we'll let you know through the e-groups and the web site.

Wednesday, February 18th, 6:00 - 9:00 p.m.
Pleasanton/Dublin School District's Science Fun Fair, held at the Alameda Co. Fairgrounds, Pleasanton. We need volunteers at the TVS booth, as well as outside with telescopes. If you'd like to help, contact Debbie Dyke at ddfam@pacbell.net or 925-461-3003. We have a limited number of parking permits, so carpooling may be necessary.

Sunday, February 22nd, 7:00 p.m.
Pleasanton Middle School star party, Pleasanton.

Saturday, March 6th, 7:45 p.m.
A boy's birthday party in Livermore. We'll need one or two volunteers for this group of nine kids, ages 7-12.

Thursday, March 11th, 7:00 p.m.
Smith Elementary School star party, Livermore.

As more info becomes available we'll post it on the e-groups and on the TVS web site.

TVS Web Site

The TVS web site has been updated and has a new look. Please take a look at the site: www.trivalleystargazers.org. Let us know if you find any problems or mistakes by sending an e-mail to tvs@trivalleystargazers.org or by posting a message to the TVS e-group.

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Officers

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Board of Directors

Alane Alchorn, Jim Alves, Mike Anderson, Rich Campbell, Paul Caswell, Debbie Dyke, Gert Gottschalk, Stan Isakson, Mike Rushford, John Swenson.

Volunteer Positions

Librarian:
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Chuck Grant

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Rich Campbell
r_photo@hotmail.com
925-586-6453 (after 9 p.m.)

Public Star Party Chair:
Rich Campbell

Historians:
Paul Caswell & Debbie Dyke

Mentor:
Mike Rushford
rushford@eyes-on-the-skies.org

Addresses

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

Lecture Meeting:
Unitarian Universalist Church
1893 N. Vasco Road, Livermore

Board & Discussion Meetings:
Round Table Pizza
1024 E. Stanley Blvd., Livermore

Web & E-mail

www.trivalleystargazers.org
tvs@trivalleystargazers.org

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.

Astro Events

Jupiter Transits

Below is a listing 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.

February

Date	Object	Starts	Transits	Ends
Wed 11	GRS	11:25p	1:25a	3:25a
Thur 12	Is	na	na	7:58p
	I	na	na	8:26p
	GRS	7:25p	9:15p	11:15p
Sat 14	Gs	12:15a	2:00a	3:40a
	GRS	1:05a	3:05a	5:05a
	G	2:06a	3:40a	5:23a
	GRS	8:50p	10:50p	12:50a
Mon 16	GRS	10:30p	12:30a	2:30a
Tue 17	GRS	na	8:22p	10:22p
Thur 19	Is	7:36p	8:45p	9:52p
	I	7:56p	9:00p	10:10p
	GRS	8:00p	10:00p	12:00a
Sat 21	GRS	1:450a	3:45a	5:45a
	Gs	4:13a	5:50a	na
	G	5:25a	na	na
	GRS	9:45p	11:45p	1:45a
Sun 22	GRS	na	7:30p	9:30p
Tue 24	GRS	7:10p	9:10p	11:10p
Thur 26	Es	6:33p	8:00p	9:25p
	E	6:52p	8:15p	9:40p
	GRS	8:45p	10:40p	12:40a
	Is	9:30p	10:36p	11:45p
	I	9:40p	10:44p	11:53p
Sat 28	GRS	10:30p	12:25a	2:15a
Sun 29	GRS	na	8:10p	10:10p

March

Tue 2	GRS	8:00p	9:50p	11:50p
Thur 4	E	9:07p	10:28p	11:56p
	Es	9:09p	10:30p	12:00a
	GRS	9:30p	11:30p	1:30a
	I	11:22p	12:26a	1:37a
	Is	11:23p	12:29a	1:38a
Fri 5	GRS	na	7:15p	9:15p
Sat 6	I	na	6:53p	8:03p
	Is	na	6:57p	8:08p
	GRS	11:15p	1:10a	3:10a
Sun 7	GRS	7:00p	9:00p	11:00p
Tue 9	GRS	8:40p	10:40p	12:40a

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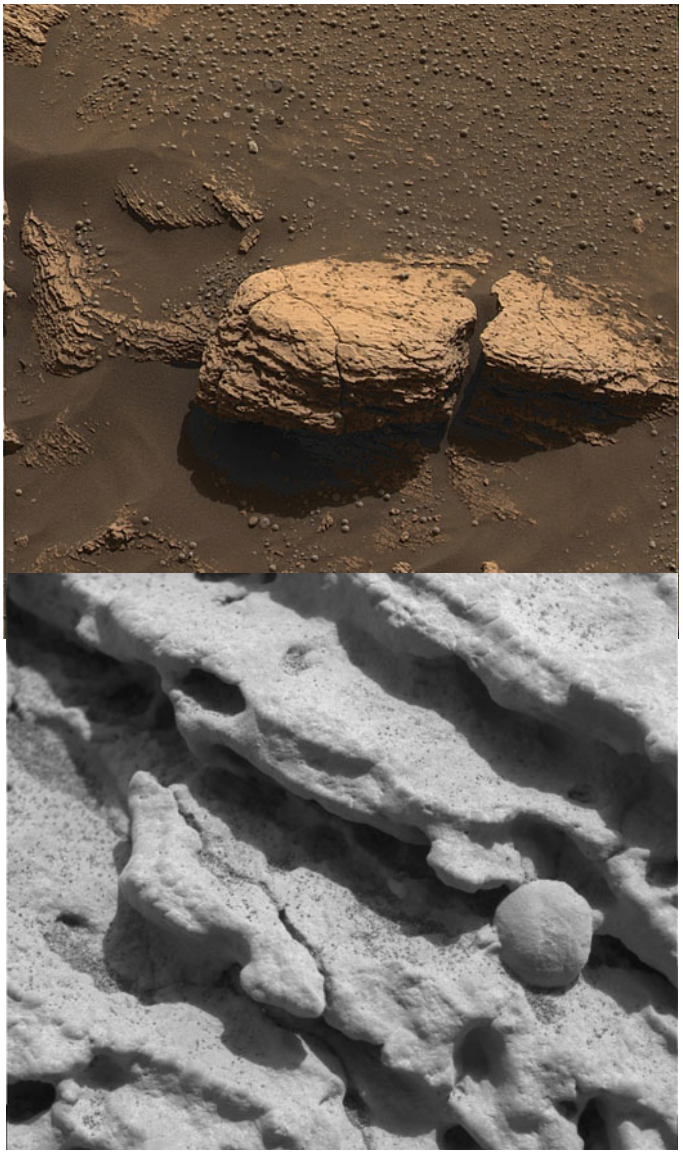
News & Notes *continued*



The rock in the upper picture has been designated Stone Mountain. The bottom picture is a close-up shot with the area shown measuring approximately 3 centimeters (1.2 inches) across.

Scientists are intrigued by the spherical rocks, which can be formed by a variety of geologic processes, including cooling of molten lava droplets and accretion of concentric layers of material around a particle or "seed." They believe that the round spheres may be made of a different substance than the layered material in which they are found.

Astronomical Insights

by David Feindel

We can only hope that this looooooong period of cloudiness and poor seeing the few nights clouds aren't present will be compensated by some skies-to-die-for nights this spring. You can only talk about green laser pointers, power supplies, winter clothing for observing, and rubylith LCD filters before insanity sets in. I've had exactly two nights of observing since Saturn's opposition on December 31. And the seeing wasn't all that great either time. Thankfully, Spirit and Opportunity are both "healthy" and sending back absolutely great pictures and data to provide some astronomical interest. I can't count the number of people who have commented on the Gusev Crater picture I have in my office. By the way, it is reassuring to see that NASA has difficulties hiding the seams when stitching photos together, just like I do in my panorama attempts.

Although Mars has now dwindled to about 6 arcsec size, making it too small to see any surface details in my 8" scope, I'm still fascinated by it. (Besides, the 2005 opposition will be extremely good by historical standards; you can't start getting ready too early!) I invested in the book *A Traveler's Guide to Mars* by William K. Hartmann. Simply an outstanding book. A totally new approach to astronomy literature; it is actually written as a tourist guide (of sorts), and pulls the metaphor off quite well, at least for the first 113 pages which I've read so far. An excellent summary of what we know about Mars immediately pre-Spirit/Opportunity, and how our view of the planet has changed over the years. I was impressed by the hand sketch he found by Christiaan Hyugens in 1659(!), and his comparisons to sketches by Dawes (1865), Schiaparelli (1888), Lowell (various 1890s), and Hubble images (1997 on). He discusses why everyone's views may have changed over the years, and has some sympathy for Lowell and his theories. One wonders how the book will change based on the data we're getting now. But still a wonderful addition to the astronomy library for the educated layperson. I just wish I had read it before the 2003 opposition.

Many observers have commented that you really need to study objects for at least 10 or 15 minutes to really begin to see details. Being somewhat of a "Type A" person, I never could study an object that long. So I have started an experiment, or will as soon as the skies clear. Several people have claimed that a comfortable observing position contributes at least as much to your enjoyment and appreciation of planets and DSOs as a Nagler eyepiece. You will look at an object longer, giving yourself more opportunity for moments of good seeing, and letting dim DSOs "imprint" in your brain if you are relaxed. So I have invested in a StarDust observing chair, which can be adjusted from about 12"off the ground (suitable for looking at the zenith), to 34", which is the perfect height for finding Mercury on the horizon as the sun goes down. A future column will report on the results of my experiment.

Astro Events *continued*

M42, The Orion Nebula. Photo taken with a Canon 10D digital SLR on a 4" Tak FSQ-106 from Pleasanton. The image is a composite of six 2-minute exposures at ISO 400, with a composite of six 30-second exposures used for the Trapezium region, which didn't resolve. All composition done with MaximDL and Photoshop.
Photo by: Ron Bissinger

Saturn. Photo taken on January 22, 2004 at 6:56 UT, with a 4" f/8 Takahashi with 5x Powermate and an IR Blocking Filter. The image is an average of about 1,700 ToUcam frames.
Photo by: Ken Sperber

What's Up *by Debbie Dyke*

All times Pacific Standard Time unless otherwise noted.

February

9 Mon For the next two weeks the **Zodiacal Light** might be visible in the West after evening twilight.

13 Fri **Last Quarter Moon** 5:40 a.m.
1852 Johann Dreyer, compiler of the NGC catalogue, born.

14 Sat Valentine's Day.

15 Sun Mercury 2.0° S of Neptune (13° W) 1:00 a.m.
1564 Galileo Galilei born.

16 Mon President's Day
Moon at perigee (228,360 mi/368,322 km)
1948 Gerard Kuiper discovers Miranda, a moon of Uranus.

18 Tues Neptune 5° N of the Moon 5:00 p.m.
1930 Clyde Tombaugh discovers Pluto using the 13-inch scope at Lowell Observatory.

19 Thurs 1473 Nicolaus Copernicus born.

20 Fri **Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.
New Moon 1:18 a.m.
1962 John Glenn becomes the first American in orbit.

21 Sat Uranus in conjunction with the Sun 6:00 p.m.

22 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.
Muharram, Islamic New Year 1425

23 Mon **Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.

24 Tues 1968 Cambridge University astronomers publish their discovery of pulsars in *Nature*.

25 Wed Mars 0.9° N of the Moon 8:00 p.m.

26 Thurs **Double shadow transit on Jupiter**. For details, see Jupiter Transits on page 4.
The Moon is 4° from the Pleiades (M45) and 12° from Mars 10:00 p.m.
1994 Clementine spacecraft begins mapping the lunar surface.

27 Fri **First Quarter Moon** 7:24 p.m.
1919 First performance of Holst's *The Planets*.

28 Sat Moon at apogee (250,640 mi/404,258 km) 3:00 a.m.

29 Sun Leap Day.
The Waxing Gibbous Moon is 5° from Saturn 10:00 p.m.

March

3 Wed Mercury in superior conjunction 6:00 p.m.
Jupiter at opposition. 9:00 p.m.

4 Thurs **Double shadow transit on Jupiter**. For details, see Jupiter Transits on page 4.

5 Fri 1979 Voyager 1 flies past Jupiter and captures first detailed images of it, its rings and moons.

6 Sat **Full Moon** 3:14 p.m.
1986 Vega 1 spacecraft encounters Comet Halley.

7 Sun 1792 John Herschel born.
1837 Henry Draper born.

9 Tues For the next two weeks, look for the Zodiacal Light in the West after evening twilight.
1986 Vega 2 spacecraft encounters Comet Halley.

NASA's Space Place

Flying In Formation

by Patrick L. Barry

You can almost see the tabloid headlines now: "Mid-west farmer spies UFO squadron flying in formation!" "First signs of imminent alien invasion," the subtitle will read.

If only this fictional farmer had been keeping up with NASA's Space Place column, he would have known better. The string of white dots moving in formation across the pre-dawn sky were satellites, not alien spaceships.

Beginning next year, a series of challenging, high-precision launches will insert four satellites into orbits with just the right altitude, position, and orbital inclination to follow in lock-step behind NASA's Aqua satellite (launched in May 2002). Scientists have dubbed this squadron of satellites the "A-Train." Along with Aqua, the celestial parade will include Cloudsat, CALIPSO, PARASOL, and Aura.

In April 2004, NASA will launch CloudSat, an Earth-observing satellite with unique cloud-measurement abilities. These measurements will fill an important role in our understanding of global climate change, making long-term climate change scenarios more accurate and dependable.

So why bother flying in formation? By passing over the same swath of land within seconds or minutes of each other, the satellites will give scientists snapshots of essentially the same scene using a total of 14 different measuring instruments. CloudSat alone carries only one: a millimeter-wavelength radar sounder.

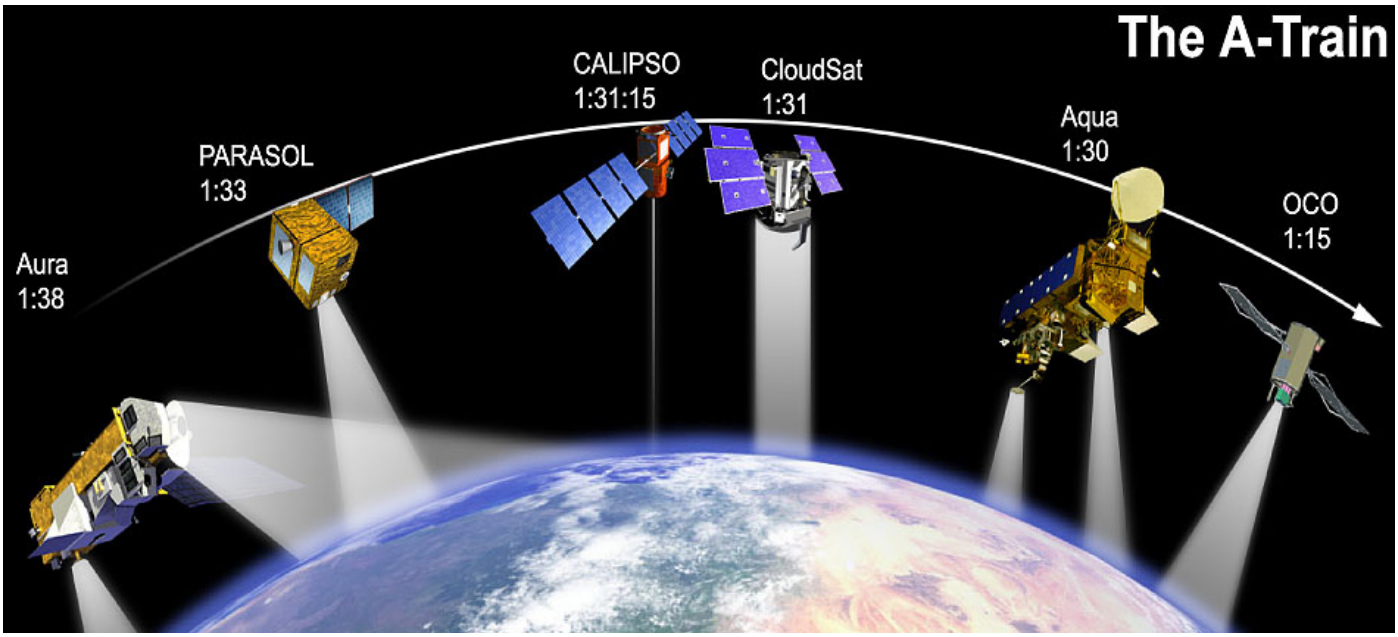
This sounder—the first of its kind put into orbit—lets scientists see a vertical "slice" of the atmosphere that shows clouds, water, and ice between the ground and 30 km altitude, with a vertical resolution of 0.5 km. Even by itself, this instrument would provide an important and unique view of Earth's atmosphere, since the accurate portrayal of clouds is one of the glaring weaknesses with current simulations of climate change.

But this cloud data is even more valuable when combined with measurements from the other satellites in the A-Train —for example, air temperature, trace gases, and radiation into and out of the atmosphere. Scientists can then see connections between, say, temperature and the resulting behavior of clouds. A better understanding of these connections is one of the most sought-after goals of climate research, because changes to global cloud cover would, in turn, have a feedback effect on global temperatures.

The real story of this satellite squadron may not make the tabloid headlines, but at least there's evidence that the imminent threat of climate change is real, which is a lot more than you can say for alien invaders!

Learn more about CloudSat and the A-Train at: cloudsat.atmos.colostate.edu. Kids (and grownups) can do interactive cloud picture scrambles and learn "Cloudspeak" (the names of different kinds of clouds) at The Space Place, spaceplace.nasa.gov/cloudsat_puz.htm.

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



CloudSat, to be launched in November 2004, will take its place as part of the "A-Train" of satellites flying in formation to take closely timed snapshots of essentially the same scene using a total of 14 different measuring instruments.

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.
_____ $25 Basic. You will receive e-mail notification when the PDF version of *Prime Focus* is available for download off the TVS web site.
_____ $30 Regular. You will receive a paper version of *Prime Focus* in the mail.
_____ $32.95 One year subscription to *Sky & Telescope* magazine.
_____ $29 One year subscription to *Astronomy* magazine.
_____ $55 Two year subscription to *Astronomy* magazine.
_____ $20 Hidden Hill Observatory (H2O) refundable key deposit (key property of TVS).
$_____ 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.