PRIMEFOCUS
Tri-Valley Stargazers

March 2004

TVS
Tri-Valley Stargazers

Meeting Info:

What
Magnificent Mars

Who
Ken Croswell

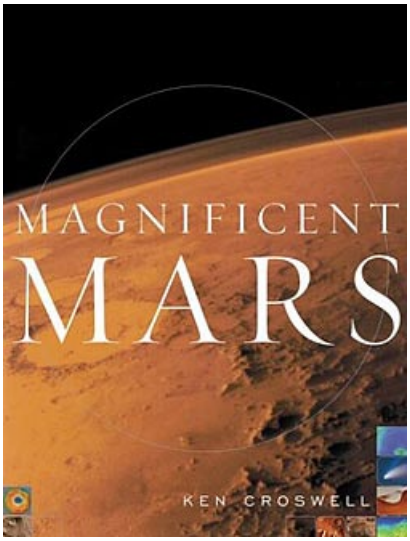
When
March 19, 2004
Conversation at 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

March Meeting

Magnificent Mars
Ken Croswell



The planet Mars has long offered the prospect of another living world in the solar system. Tonight, with an armada of spacecraft scrutinizing the red planet as never before, I'll show you the best color images of Mars and describe the planet from pole to pole, exploring Martian geology, the Martian atmosphere, Martian volcanoes, and Martian water, all organized around the four great elements of Mars: Earth, Air, Fire, and Water. Along the way you'll see nearly every image from my new book *Magnificent Mars*, including volcanoes over twice as tall as Mount Everest, canyons that could stretch from Ohio to California, and floods of water far greater than any known on Earth. Billions of years ago, on a world warmer and wetter, Mars may have given rise to life whose fossils await discovery today.

Ken Croswell is an astronomer and author living in Berkeley. One independent study found that he has a "quick, active mind" and dislikes "tedious monotony." He has no affiliation with the University of California at Berkeley, though he has been known to wear Cal sweatpants.

He earned his doctorate in astronomy from Harvard University for studying his favorite galaxy, the Milky Way—in particular, for observing distant stars in the Galactic halo and thick disk. During this study, he discovered a star located 100,000 light-years above the Galactic plane. Too bad for him that this star already had a name, Basel 799.

The Milky Way is the subject of his first book, *The Alchemy of the Heavens*, nominated for a Los Angeles Times Book Prize. His second book, *Planet Quest*, explores the discovery of new planets in other solar systems and was named a New York Times Notable Book of the Year.

His bestselling book to date, *Magnificent Universe*, is a lavish celebration of the heavens, with one hundred large, full-color astronomical photographs. The book weighs nearly 5 pounds.

His fourth book, *See the Stars*, is the simplest constellation guide there is—so simple, in fact, that even he might have been able to use it when he was a

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child. His fifth book, *The Universe at Midnight*, explores the latest developments in cosmology; it was named the best astronomy book of the year by New Scientist.

His newest book, *Magnificent Mars*, presents the red planet in all its glory, with stunning images of Mars and its moons, following the same large, lavish format as *Magnificent Universe*. It, too, weighs nearly 5 pounds.

Dr. Croswell's books have been translated into Chinese, German, Polish, and even Serbian.

Ken will be bringing all six of his books (all of them hard-cover) to the meeting in case anyone wishes to purchase them. Ken takes cash or check, but not credit cards. The prices, including tax, are:

Magnificent Mars: $65

Magnificent Universe: $65

The Universe at Midnight: $29

See the Stars: $18

Planet Quest: $27

Alchemy of the Heavens: $27

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**
Mar. 19	Mar. 22	Mar. 7
Apr. 16	Apr. 19	Apr. 4
May 21	May 24	May 9

Money Matters

At the February Board meeting, Treasurer **Gary Steinhour** gave us the account balances (as of February 23, 2004) of TVS's accounts:

Checking	$1,013.09	
CD #1	$3,930.46	matures 05/17/04
CD #2	$2,421.97	matures 03/27/04
CD #3	$2,066.49	matures 04/16/04

TVS & NASA's Night Sky Network

The TVS applied to the NASA's Night Sky Network and was accepted into the program. What is the Night Sky Network you ask? From the Night Sky Network web site:

"The Night Sky Network is a partnership of amateur astronomy clubs, NASA, Astronomical Society of the Pacific, and the Astronomical League.

Amateur astronomers regularly share their knowledge, time, and telescopes to bring amazing aspects of astronomy to the public.

In 2002, the Astronomical Society of the Pacific conducted a survey of amateur astronomers to determine the nature of outreach by amateurs. In the survey, amateurs express the need for support of their outreach efforts. The main requests were:

- Materials on themed topics
- Training in the use of the materials
- Effective ways to communicate with varied audiences
- Networking with other amateurs doing outreach

The Night Sky Network was inaugurated to help meet these needs.

Amateur astronomers have an interest in providing the public with entertaining, engaging ways to learn basic astronomy concepts. It is one of NASA's education goals as well to improve the American public's understanding of astronomy.

The Night Sky Network was developed with the dedicated assistance of an advisory team of amateur astronomy clubs.

The Night Sky Network is a coalition of amateur astronomy clubs, sponsored and supported by JPL's PlanetQuest program and the Astronomical Society of the Pacific (ASP)."

TVS will be using the material received from the Night Sky Network to present new and updated programs to the public during our school and public star parties. We may also use the TVS lecture meetings to "test" some of the material.

Our Night Sky coordinator is **Rich Campbell**. Rich will receive all the goodies from NASA, as well as maintain a list of club members participating in this endeavor. If you would like to help with the TVS Night Sky outreach events, contact Rich at r_photo@hotmail.com or 925-586-6453 (after 9 p.m.).

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Newsletter header image: V838 in Monoceros

This image is Hubble's latest view of an expanding halo of light around a distant star, named V838 Monocerotis (V838 Mon). The image was obtained with the Advanced Camera for Surveys on February 8, 2004. The illumination of interstellar dust comes from the red supergiant star at the middle of the image, which gave off a flashbulb-like pulse of light two years ago. V838 Mon is located about 20,000 light-years away from Earth in the direction of the constellation Monoceros, placing the star at the outer edge of our Milky Way galaxy.

Photo: NASA and The Hubble Heritage Team (STScI/AURA)

Calendar of Events

April 4, noon
What: *SJAA Astronomical Auction & Swap Meet*
Who: SJAA (San Jose Astronomical Association)
Where: Hogue Park, San Jose
Cost: Free

The SJAA Auction will be conducted at Houge Park in San Jose Sunday April 4th starting at noon. Kevin Medlock will be our auctioneer.

Telescopes, eyepieces, mountings, mirrors, lenses, clock drives, books, camera equipment, star charts, finders, tubes, diagonals, photographs, space art everything you need to make your hobby more enjoyable. You name it, it's likely to be there! Check your garage and closets for anything astronomical you would like to sell. Anyone can buy and sell! It's fun and easy! This is the 24th year for the auction. For more information see the recent article in the SJAA Ephemeris.

Doors open at 12:00 p.m. (or only slightly before) to register material for the auction, and view the auction material. The club reserves the right to accept only appropriate material for the auction so that the auction will run smoothly. The auction will begin at 1 p.m., and will run as long as needed. Seller may specify a minimum bid, which if not met, will return the item back to the seller with no commission applied. After the auction, buyers and sellers settle up using one check to (or from) SJAA and claim their items. Seller pays 10% commission, with a cap of $50 for any one item. We do not handle charge cards. There is no fee for bidder cards.

After the auction, material for the swap meet will be allowed into the hall, about 3 p.m. or perhaps earlier.

At the swap, each buyer pays the seller. Sellers are to keep track of their sales and pay a 10% commission for the auction. There are no table fees.

Do you have a large item to sell such as a telescope or more than 5 Items? Please e-mail auction@sjaa.net with a description and a photo of the item or a link to your own web site for some pre-swap publicity.

Some of the items for sale:

The San Francisco Amateur Astronomers would like to auction an antique Unitron 2.5-inch refractor telescope. This scope still has the original wooden carrying case and tripod in excellent condition, plus a selection of .965 eyepieces of varying types and focal lengths. The scope also comes with some original promotional materials from the Unitron company, probably dating to the 1950's or 1960's.

A Meade AR-6 Achromatic Refractor, with Autostar GO TO, a LXD55 equatorial mount, and a home made wooden carrying case with styrofoam inside for protection. The scope is one year old, only used six times.

SFAA's 2.5-inch Unitron refractor up for grabs at the SJAA Auction and Swap Meet.

Officers

President:
Chuck Grant
cg@fx4m.com
925-422-7278

Vice-President:
Rich Campbell
r_photo@hotmail.com

Treasurer:
Gary Steinhour
steinhour1@juno.com

Secretary:
Maggie Halberg
925-736-8627

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:
Jim Alves
jim_alves_engr@yahoo.com
925-634-0220

Newsletter Editor:
Debbie Dyke
ddfam@pacbell.net
925-461-3003

Program Director: unfilled

Loaner Scope Manager:
John Swenson
johnswenson1@comcast.net

Webmaster:
Chuck Grant

Observatory Director/ Key Master:
Chuck Grant

School Star Party Chair:
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.

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

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. Times that are in **bold** type are multiple shadow transit events in prime viewing times.

March

Date	Object	Starts	Transits	Ends
Tue 9	GRS	8:40p	10:40p	12:40a
Thur 11	GRS	10:15p	12:15a	2:15a
	E	11:22p	12:44a	2:11a
	Es	11:45p	1:06a	2:38a
Fri 12	I	1:06a	2:10a	3:20a
	Is	1:17a	2:20a	3:32a
	GRS	na	8:05p	10:05p
Sat 13	**I**	**7:32p**	**8:38p**	**9:47p**
	Is	**7:46p**	**8:50p**	**10:00p**
	GRS	11:50p	1:50a	3:50a
Sun 14	GRS	7:45p	9:45p	11:45p
Tue 16	GRS	9:20p	11:20p	1:20p
Thur 18	GRS	11:00p	1:00a	3:00a
Fri 19	E	1:39a	3:00a	4:28a
	Es	2:23a	3:39a	5:15a
	I	2:50a	3:52a	5:05a
	Is	3:12a	4:12a	5:27a
	GRS	7:05p	9:05p	11:05p
Sat 20	G	na	8:05p	9:48p
	Gs	8:03p	9:40p	11:30p
	I	9:16p	10:22p	11:31p
	Is	9:40p	10:42p	11:55p
Sun 21	GRS	12:40a	2:40a	4:40a
	GRS	8:30p	10:30p	12:30a
Tue 23	GRS	10:10p	12:10a	2:10a
Wed 24	GRS	na	8:00p	10:00p
Fri 26	GRS	7:50p	9:50p	11:50p
Sat 27	Cs	9:00p	10:30p	12:30a
	G	9:50p	11:25p	1:09a
	I	11:00p	12:08a	1:15a
	Is	11:33p	12:35a	1:49a
Sun 28	Gs	12:03a	1:34a	3:28a
	GRS	1:20a	3:20a	5:20a
	GRS	9:25p	11:25p	1:25a
Mon 29	**E**	**5:05p**	**6:30p**	**7:55p**
	I	**5:27p**	**6:35p**	**7:42p**
	Is	**6:00p**	**7:03p**	**8:16p**
	Es	**6:18p**	**7:36p**	**9:08p**
	GRS	**5:15p**	**7:12p**	**9:08p**
Wed 31	GRS	7:15p	8:50p	10:50p

April

Thur 1	GRS	8:35p	10:30p	12:20a

Note: The transits on Sunday the 4th are listed in PST, even though at 2:00 a.m. Daylight Savings Time kicks in.

Sun 4	I	12:47a	1:52a	3:00a
	G	1:13a	2:50a	4:34a
	Is	1:28a	2:25a	3:42a
	GRS	2:10a	4:05a	na
	Gs	4:02a	na	na

Note: All times are now PDT.

Mon 5	**GRS**	**na**	**8:50p**	**10:50p**
	I	**8:14p**	**9:17p**	**10:28p**
	E	**8:25p**	**9:47p**	**11:16p**
	Is	**8:56p**	**9:55p**	**11:11p**
	Es	**9:56p**	**11:10p**	**12:45a**
Wed 7	GRS	8:30p	10:30p	12:30a
Fri 9	GRS	10:20p	12:10a	2:10a

Star Parties

The summer star party season is just around the corner and already announcements are being made for some of the larger star parties.

Shingletown Star Party

Nights of June 16 through June 20, 2004.

Star party closes June 21, 2004.

This is the SSP's third year. It offers some of California's darkest skies and convenient easy-highway access. The star party is held on the runway of a closed airport, so there's no dirt or tumbleweeds on the setup field.

This year's SSP is adding a shower truck and ice truck to its list of amenities. Just a few miles away is the resort community of Shingletown which provides full services. Beautiful Mount Lassen National Volcanic Park is 17 miles up the mountain.

Registration this year is limited to 300 attendees. Find SSP 2004 at http://www.shingletownstarparty.org.

Desert Star Party

Thursday May 13 until Sunday May 16, 2004

To be held at Caballo Loco Ranch RV Park, 11.5 miles south of Three Points, AZ.
http://chartmarker.tripod.com/sunset.htm

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Astronomical Insights

by David Feindel

Time for yet another shameless plug for Chabot. Go see *Ring World*. It's a 40 minute program shown in the planetarium on the Cassini-Huygens mission. After a brief bit of history on observing Saturn, it quickly focuses on what we've learned about the planet from the Voyager 1 & 2 missions in the late 70s, and then devotes the last 20 minutes or so on the anticipated flight plan of C-H and what we might learn from it. The pictures of the various Saturnian moons are spectacular. Although we've all seen them before in books and magazines, there's something extra there when the images are 10' high. During its anticipated 4-year mission orbiting Saturn, it will get a close look at most of the larger moons, in addition to the planet itself and the rings. The program is fairly deep into the science for a "public-oriented" program, talking about Jupiter's magnetic field, which it explored in 2000 during its flyby of that planet, and how the Huygens Explorer module is going to slow down from about 50,000 mph to (hopefully) 0 when it lands on Titan. The official web site, http://saturn.jpl.nasa.gov/index.cfm, also says that a DVD of this program is available. And one other spectacular exhibit at Chabot—a high-res printout of a panorama image from Spirit (I think) showing its MER digging into a rock. About 5' long by 1' high, the image is breath-taking.

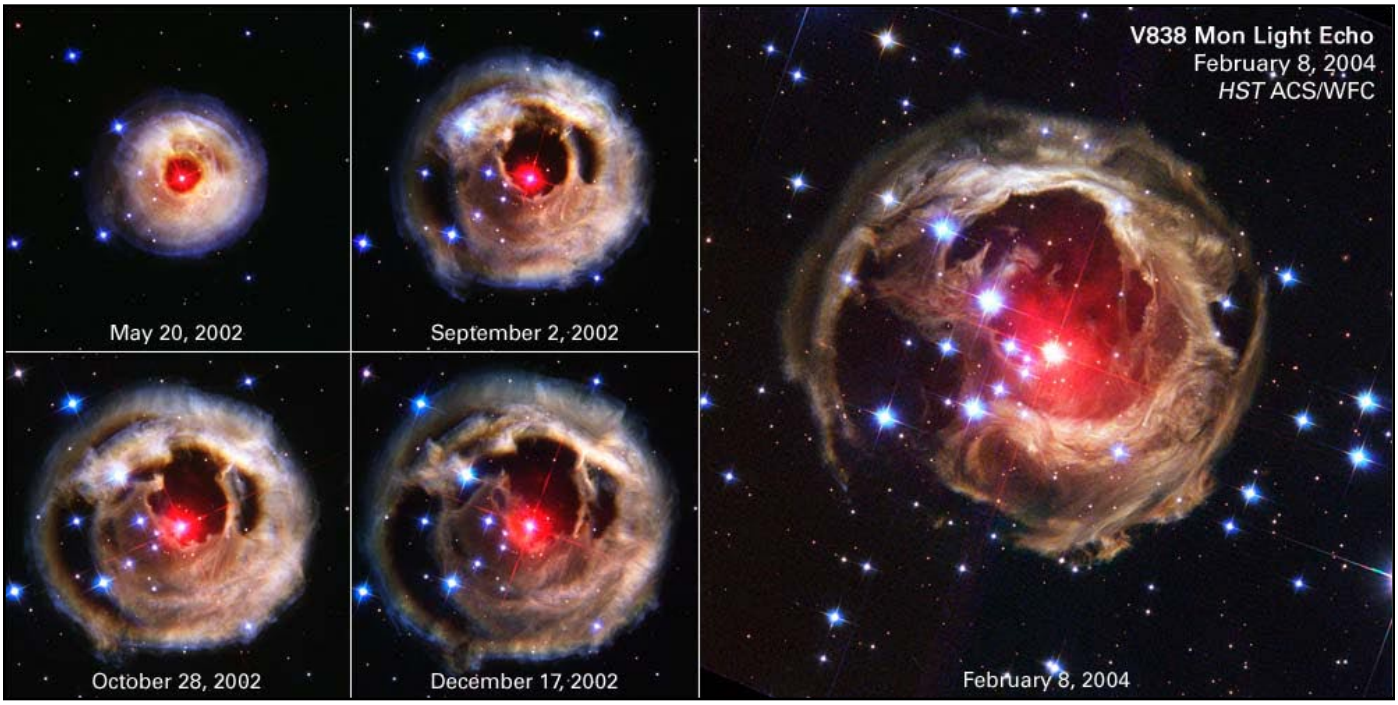
Being the tail end of the rainy season, much of my "observing" the past month has been via the net. One of the interesting labors of love I came across is a web site devoted to the history of telescopes, www.antiquetelescopes.org. One of the site's recent additions is a lengthy essay on the telescopes Captain Cook had with him on his voyage to observe the transit of Venus in 1761. His voyage was as much a challenge to the technology of his time as C-H is to ours. Also came across a freeware program called Aberrator (http://aberrator.astronomy.net/index.html) that shows what the various aberrations look like for star-testing. Its an obvious ploy by the telescope makers to push us all into $5,000 apos or newts with $3,000 mirrors. But it also appears to be an excellent learning tool for determining just how good of an image you can achieve, and what the possible degradations might look like.

Clear skies to all, especially March 20th for the TVS Messier Marathon at H2O.

News & Notes *continued*

TVS Messier Marathon

The first of two TVS Messier Marathons will take place on Saturday, March 20th. The usual routine is for everyone to meet at the corner of Mines and Tesla for caravaning to H2O. Don't forget to bring $3 exact change and any thing you might need for the night (H2O is a long ways from 'civilization'). Details will be posted on the TVS home page soon.



A time lapsed sequence of images of V838 in Monoceros (this month's Prime Focus header image). The first image is from May 2002, the last is from just last month, February 2004. To our eyes, most of what we see in the night sky changes very little from year to year, or even century to century. But as this series of photos shows, there are exceptions. *Photo: NASA, ESA, H.E. Bond (STScI) and The Hubble Heritage Team (STScI/AURA)*

What's Up *by Debbie Dyke*

All times Pacific Standard Time unless otherwise noted.

March

9	Tues	For the next two weeks, look for the Zodiacal Light in the West after evening twilight.
10	Wed	1977 James Elliot discovers the rings of Uranus.
11	Thurs	Moon at perigee (229,093 mi/369,506 km) 8:00 p.m.
13	Sat	**Last Quarter Moon** 1:01 p.m. 1781 Wilhelm Herschel discovers Uranus using a 6-inch scope he built himself.
16	Tue	1926 Robert Goddard launches first liquid-fuel rocket.
17	Wed	St. Patrick's Day.
18	Thurs	1965 First walk in space by Cosmonaut Alexei Leonov from the Voskhod 2.
19	Fri	**Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore. Spring has sprung! The **Vernal Equinox** starts at 10:49 p.m.
20	Sat	**New Moon** 2:41 p.m. **Double shadow transit on Jupiter**. Check Jupiter Transits feature on page 4 for details. Look for a very thin crescent Moon 5° below Venus in the West 9:00 p.m.
21	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.
22	Mon	**Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.
23	Tues	1840 First photo of the Moon taken.
24	Wed	Crescent Moon less than 3° from Venus 8:00 p.m.
25	Thurs	Moon 1.5° above Mars 8:00 p.m. 1655 Christiaan Huygens discovers Saturn's largest moon, Titan.
26	Fri	Moon at apogee (250,803 mi/404,521 km) 11:00 p.m.
28	Sun	**Double shadow transit on Jupiter**. Check Jupiter Transits feature on page 4 for details. Saturn 6° S of the Moon 8:00 p.m. **First Quarter Moon** 3:48 p.m.
29	Mon	Mercury at greatest elongation E (19°) 4:00 a.m. Look for Mercury in the west after sunset. This is one of the best times to see it this year. Venus at greatest elongation E (46°) 9:00 a.m. **Double shadow transit on Jupiter**. Check Jupiter Transits feature on page 4 for details. 1974 Mariner 10 makes first flyby of Mercury and sends pictures home.

April

1	Thurs	Saturn at extreme declination +22°49' 6:00 p.m.
2	Fri	Venus 0.6° S of the Pleiades (M45) 8:00 p.m. 1845 First photo taken of the sun by Louis Fizeau and Leon Foucault.
4	Sun	**Daylight Savings Begins** 2:00 a.m. Spring Forward — move your clocks ahead one hour!
6	Tues	Mars 7° N of Aldebaran 8:30 p.m. Moon at perigee (226,019 mi/364,547 km) 7:00 p.m. 1852 Sir Edward Sabine announces that the 11 year sunspot cycle coincides with the geomagnetic cycle.

NASA's Space Place

Deep Space Network 2-for-1 Sale!

by Patrick L. Barry

Call it a "buy one, get one free" sale for astronomers: Build a network of radio dishes for communicating with solar-system probes, get a world-class radio telescope with a resolution nearly as good as a telescope the size of Earth!

That's the incidental bonus that NASA's Deep Space Network (DSN) offers the astronomy community. Designed to maintain contact with distant spacecraft in spite of the Earth's rotation, the large, widely spaced dishes of the DSN are ideal for performing a form of radio astronomy called "very long baseline interferometry" (VLBI).

VLBI produces very high resolution images of the cosmos by combining the output from two or more telescopes. The result is like having a giant "virtual" telescope as large as the distance between the real dishes! Since bigger telescopes can produce higher resolution images than smaller ones, astronomers need to use dishes that are as far apart as possible.

That need dovetails nicely with the DSN's design. To maintain continuous contact with deep space missions, the DSN has tracking stations placed in California, Spain, and Australia. These locations are roughly equally spaced around the Earth, each about 120 degrees of longitude from the others-that way at least one dish can always communicate with a probe regardless of Earth's rotation. That also means, though, that the straight-line distance between any two of the stations is roughly 85 percent of Earth's diameter-or about 6,700 miles. That's almost as far apart as land-based telescopes can be.

The Goldstone Radio Telescope, located in the Mojave Desert, is part of the Deep Space Network. Two other radio telescopes are part of the network—one near Madrid, Spain, the other near Canberra, Australia.

"We often collaborate with other VLBI groups around the world, combining our dishes with theirs to produce even better images," says Michael J. Klein, manager of the DSN Science Office at NASA's Jet Propulsion Laboratory. "Since our 70-meter dish in Canberra, Australia, is the largest dish in the southern hemisphere, adding that dish in particular makes a huge difference in the quality of a VLBI observation."

Even though only about 1 percent of the DSN's schedule is typically spared from probe-tracking duty and scheduled for radio astronomy, it manages to make some important contributions to radio astronomy. For example, the DSN is currently helping image the expanding remnant of supernova 1987A, and Dr. Lincoln Greenhill of the Smithsonian Astrophysical Observatory is using the DSN dishes to explore a new way to measure the distances and velocities of galaxies.

And all this comes as a "bonus" from the dishes of the DSN.

To introduce kids to multi-wavelength astronomy, NASA's web site for kids, The Space Place, has just added the interactive demo, "Cosmic Colors," at spaceplace.nasa.gov/cosmic.

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

Astro Events *continued*

Texas Star Party
May 16 - 23, 2004

One of the largest star parties of the nation, located near Fort Davis, Texas. http://www.texasstarparty.org

RTMC (Riverside Telescope Makers' Conference) Astronomy Expo
May 28-30, 2004

The ever popular RTMC takes place every year during Memorial Day weekend. RTMC takes place at Camp Oaks in the town of Big Bear in the San Bernardino mountains just north of LA. http://www.rtmcastronomyexpo.org/

Grand Canyon Star Party
June 12-19, 2004

Tucson Amateur Astronomy Association hosts this star party held at, where else, the Grand Canyon. http://www.tucsonastronomy.org/gcsp.html

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.