PRIMEFOCUS

Tri-Valley Stargazers

February 2003

TVS Tri-Valley Stargazers

Meeting Info:

What
Introduction to Astronomy

Who
Chuck Marble

When
February 21, 2003
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

Introduction to Astronomy

Chuck Marble

Our March meeting will be a multi-media event devoted to the basics of astronomy. Chuck Marble, a former TVS member, will discuss all manner of things that will be helpful to those just getting started in this wonderful hobby of astronomy.

Chuck has produced several astronomy videos under his Marble Productions company. He is a ham radio operator and has communicated with shuttle astronauts as they passed overhead.

Columbia

The shock is beginning to recede, leaving us with speculations about what happened and debates about whether anything is gained from manned space missions. There isn't much that I could say that hasn't already been said. Instead, I'll reprint something NASA wrote three days after Columbia broke up over Texas. - *Editor*

Feb. 4, 2003: At the dawn of the space age some 40 years ago, we always knew who was orbiting Earth or flying to the Moon. Neil Armstrong, Yuri Gagarin, John Glenn. They were household names—everywhere.

Lately it's different. Space flight has become more "routine." Another flight of the shuttle. Another visit to the space station. Who's onboard this time? Unless you're a NASA employee or a serious space enthusiast, you might not know.

Dave Brown, Rick Husband, Laurel Clark, Kalpana Chawla, Michael Anderson, William McCool, and Ilan Ramon.

Now we know. Those are the names of the seven astronauts who were tragically lost on Saturday, Feb. 1st, when the space shuttle Columbia (STS-107) broke apart over Texas.

Before the accident, perhaps, they were strangers to you. But if that's so, why did you have a knot in your gut when you heard the news? What were those

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News & Notes

tears all about? Why do you feel so deep-down sad for seven strangers?

Astronauts have an unaccountable hold on us. They are explorers. Curious, humorous, serious, daring, careful. Where they go, they go in peace. Every kid wants to be one. Astronauts are the essence of humanity.

They are not strangers. They are us.

While still in orbit Dave Brown asked, jokingly, "do we really have to come back?"

No. But we wish you had.

For Science@NASA: Tony Phillips, Ron Koczor, Bryan Walls, Becky Bray, Patrick Meyer.

Science Fun Fair

Every year, TVS participates in the Pleasanton School District's Science Fun Fair. If it's clear, we could use some volunteers to bring their scopes to this event, which is expected to attract 12,000 people. It takes place on Thursday, February 20 from 5:30 to 9:00 p.m. at the Alameda County Fairgrounds in Pleasanton. Please let **Chuck Grant** or **Debbie Dyke** know if you are interested in helping.

School Star Party Help Wanted

TVS will be on hand at the Croce School in Livermore on February 26 from 6:00 to 8:00 p.m. for a school-wide evening program. The school expects about 200 people to attend the evening's event, so we could use as many telescopes as possible in case we get swamped with lots of viewers. Clouds will cancel the need for scopes. Please let **Chuck Grant** know if you'll be able to help out.

2003 TVS Meeting Dates

Below are the next few TVS meeting dates. The lecture meetings are held on the third Friday of the month, with the Board meeting on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month's issue (e.g., the March 9th deadline is for the March issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
Feb. 21	Feb. 24	Feb. 9
Mar. 21	Mar. 24	Mar. 9
Apr. 18	Apr. 21	Apr. 6

Dues Are Due

Our membership year ended in December. If you wish to keep your *Prime Focus* delivered to your doorstep, or computer, without interruption renew now! For those who subscribe to *Sky & Telescope* or *Astronomy* magazine through the club, you need to renew now so that you won't miss an issue.

Money Matters

At the January Board meeting, Treasurer **Gary Steinhour** left word that the balances (as of January 16, 2003) of the following TVS accounts were:

Checking	$1,787.67	
CD #1	$3,896.67	matures 02/17/03
CD #2	$2,404.78	matures 02/27/03
CD #3	$2,052.60	matures 04/16/03

RASC Handbooks

We still have some RASC (Royal Astronomical Society of Canada) Observer's Handbooks available for $15. They are chock-full of all kinds of useful information. If you'd like more information about it, visit the RASC web site at www.rasc.ca and click on the 'Publications' link. If you wish to purchase one, come to the February meeting and see our Treasurer **Gary Steinhour**.

Calendar of Events

Classic Sci-Fi Film Series

Chabot Space & Science Center

The movies are shown at the 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:

X-Men: The Movie, March 7-9
ET , April 4-6
The Mummy, May 2-4

Showtimes:

Friday – Sunday on the first weekend of each month.

Friday & Saturday – 7:30 p.m., Sunday – 4:00 p.m.

Newsletter header image: Earth (the dot in the middle) as seen from 3.7 billion miles away by the Voyager 1 spacecraft, on June 6, 1990.

"It has been said that astronomy is a humbling and character building experience. There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known." *- Carl Sagan*

Photo and info: NASA

Calendar of Events *continued*

February 20, 7:30 p.m.
What: *Planets and Prospects for Life in the Universe*
Who: Dr. Geoff Marcy (U.C. Berkeley)
Where: Chabot Space & Science Center, Oakland.
Cost: $5

Do other Earth-like planets exists? What conditions are required for alien life to survive on planets? These questions and others are finally being answered by using the discoveries of other worlds in our Milky Way Galaxy. Join the world's premier "planet hunter" as he presents the latest results about the possibility of life-bearing planets in our quadrant of the Galaxy.

Dr. Marcy's research has focused on the detection of extrasolar planets and brown dwarfs. Dr. Marcy is participating in Berkeley's new "Center for Integrative Planetary Science", designed to study the formation, geophysics, chemistry, and evolution of planets.

You can meet the speaker at a dessert reception following the lecture.

February 25, 7:30 p.m.
What: *The Birth of the Milky Way: The First Step in our Origins*
Who: Dr. Alan Dressler (Carnegie Institute of Washington)
Where: Morrison Planetarium, S.F.
Cost: $3

Step by step, the astronomical events and processes that led to our world and made possible the emergence of life are becoming better understood. The universe as we see it today began sometime within a billion years of the Big Bang, with the formation of the first stars and galaxies, and the synthesis of the first heavy elements. A goal of astronomy over the next two decades is to observe and understand how stars and galaxies were born by looking back in time to their first appearance. Through this research, with new giant telescopes on Earth, a new space telescope, and powerful computer simulations, we hope to answer the general question of how galaxies formed and tie this to the specific question of how our own Milky Way Galaxy evolved and gave birth to the Sun and its family of planets 5 billion years ago.

February 28, 10:00 p.m. to 5:00 a.m.
What: *Live From the Aurora!*
Who: NASA and you
Where: Chabot Space & Science Center, Oakland.
Cost: $50

Don't miss this exciting chance to be a part of NASA's *Live from the Aurora* documentary. As a participant in this overnight workshop, you will view a live broadcast from the Poker Flat Research Range in Alaska (from 2:00 to 4:00 a.m.) and ask the Alaskan scientists questions via telephone about what you are seeing. Documentary crews will be filming footage at Chabot to incorporate into the NASA documentary. Along with the live, interactive centerpiece of the night's activities, Chabot will conduct fun educational workshop-style activities for participants, provide local scientists to answer questions, and present a special showing of the film Solarmax.

March 2, 6:30 to 8:30 p.m.
What: *An Evening with John Glenn*
Who: John and Annie Glenn
Where: Chabot Space & Science Center, Oakland.
Cost: $100 (Lecture proceeds benefit the Global Children's Organization.)

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Astro Events

Jupiter Transits

Below is 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.

February

Thur 13	GRS	na	7:30p	9:30p
Fri 14	I	9:50p	10:55p	12:05a
	Is	10:09p	11:15p	12:23a
	GRS	11:25p	1:25a	3:30a
Sat 15	E	12:48a	2:08a	3:38a
	Es	1:26a	2:43a	4:17a
	GRS	7:20p	9:10p	11:10p
Mon 17	GRS	9:00p	11:00p	1:00a
Tues 18	GRS	na	6:35p	8:35p
Wed 19	C	na	6:45p	9:10p
	Cs	8:30p	10:40p	1:17a
	GRS	10:33p	12:33a	2:33a
Thurs 20	G	na	na	7:05p
	Gs	na	7:05p	8:57p
	GRS	6:30p	8:30p	10:30p
Fri 21	I	11:35p	12:38a	1:49a
Sat 22	Is	12:03a	1:04a	2:18a
	GRS	12:15a	2:15a	4:15a
	E	3:03a	4:25a	5:54a
	Es	4:03a	5:21a	na
	GRS	8:05p	10:05p	12:05a
Sun 23	GRS	na	5:55p	7:55p
	I	na	7:10p	8:16p
	Is	6:32p	7:40p	8:45p
Mon 24	GRS	9:40p	11:40p	1:40a
Tues 25	E	na	na	7:04p
	Es	na	6:40p	8:12p
	GRS	na	7:30p	9:30p
Thur 27	G	6:55p	8:35p	10:25p
	GRS	7:15p	9:15p	11:15p
	Gs	9:20p	11:00p	12:55a

March

Sat 1	GRS	1:00a	3:00a	5:00a
	I	1:20a	2:23a	3:35a
	Is	1:58a	3:00a	4:15a
	E	5:20a	na	na
	GRS	8:50p	10:50p	12:50a
Sun 2	GRS	na	6:45p	8:45p
	I	7:45p	8:55p	10:05p
	Is	8:26p	9:30p	10:40p
Mon 3	GRS	10:35p	12:35a	2:35a
Tues 4	GRS	6:30p	8:20p	10:20p
	E	6:30p	7:55p	9:20p
	Es	7:55p	9:15p	10:45p
Thurs 6	GRS	8:05p	10:05p	12:05a
	G	10:15p	12:00a	1:48a
Sat 8	GRS	1:45a	3:45a	na
	I	3:05a	4:12a	na
	Is	3:53a	4:50a	na
	GRS	9:45p	11:35p	1:35a
Sun 9	GRS	na	7:25p	9:25p
	I	9:35p	10:40p	11:47p
	Is	10:22p	11:20p	12:35a
Tues 11	GRS	7:10p	9:10p	11:10p
	E	8:53p	10:15p	11:38p
	Es	10:33p	11:47p	1:20a

Astronomical Insights

by David Feindel

This winter lived up to the Bay Area's tradition of being mostly cloudy, completely overcast, and/or foggy, making observing problematical. So I became even more of an armchair astronomer, going through numerous books, web sites, and a "field trip".

Mars: The Lure of the Red Planet, by William Sheehan & Stephen James O'Meara, covers the impact Mars has had on human thought and culture, from the ancients through Sojourner. The authors point out the importance of Kepler selecting to use data on Mars to discover the laws of planetary motion. Mars' orbit, with an eccentricity of 0.0934, was carefully and accurately determined by Tyco Brahe. But if Kepler had chosen to use Jupiter or Saturn data, his task would have been much more difficult, because the effect is much less obvious for planets with more circular orbits. A great deal of attention is paid to the major astronomers who studied Mars, including Cassini, Schiaparelli, and Lowell. Did you know that Schiaparelli produced probably the most accurate descriptions of Mars in the 19th century, despite being color blind? And yes, a chapter is devoted to *War of the Worlds* and Edgar Rice Burrough's *Barsoom*. Lastly, the book has about 20 pages devoted to studying Mars through amateur telescopes. This section alone is worth the price of the book, providing Sheehan's and O'Meara's suggestions

and advice on what to look for and how to look for it during the upcoming opposition.

The "field trip" was a result of being sent to Europe as part of my "other life". Stuttgart Planetarium is located in the city center park, next to the train station. Built in 1979, it has a Zeiss Mark VI projector mounted in its 277 seat 15-meter radius theater. The pre-recorded show, given in German, posed only a bit of a problem to us illiterates; it was remarkable how much information came through despite the language barrier. The show lasted 50 minutes, proving that both Americans and Germans have similar attention spans. But it was a bit more technical than what is commonly found here, going through a bit of the math involved in Kepler's three laws. And just like here, the last third of the presentation was "popular science"—comets. The show explained what they are, where they come from, and the history of the most spectacular ones of the late 20th century. But my feeling at the end was to count our blessings here in the Bay Area; Chabot's planetarium is more sophisticated, and at least some of the shows are "live".

NASA's Space Place

Enlightened by the Darkness

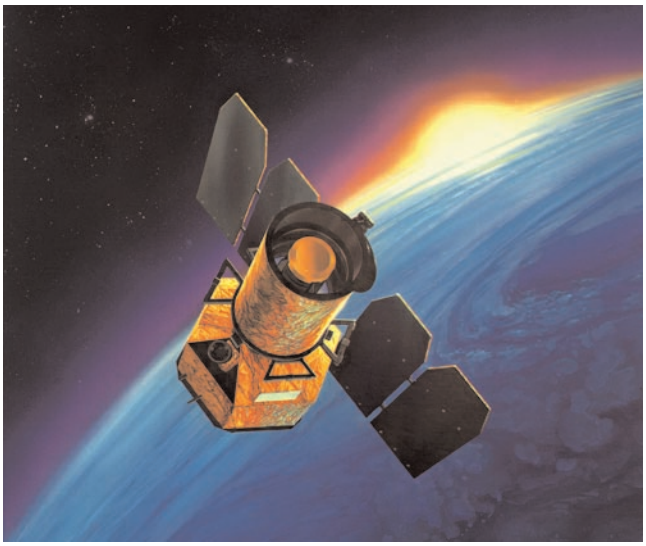
by Diane K. Fisher

On the clearest of nights, I may see a dozen stars from my suburban backyard near Los Angeles. Unfortunately, my studies of space and astronomy have been confined to books and the pictures taken by others. Seldom have I experienced for myself a truly dark, clear, moonless sky.

One of those rare times was a summer camping trip in Bryce Canyon, Utah. I lay on my sleeping bag in an open area away from trees. I saw millions of stars (so it seemed) and the cloud of the Milky Way streaking across the sky. Nothing of planet Earth was in my view. It was then I glimpsed my true situation in the universe, a speck of dust clinging to a tiny stone hurtling through the darkness of a cold, infinite universe. I was awestruck by the beauty of the stars and the darkness—and terrified!

In the light of day and a more "down-to-Earth" state of mind, I wondered: With around 100 billion galaxies out there, why is it still so dark out there?

Until the 20th century, astronomers thought the universe was infinite. They were perplexed though, because in an infinite universe, no matter where you look in the night sky, you should see a star. Stars should overlap each other and the sky should be blazing with light and hot as the sun. This problem became known as "Olber's Paradox."



The GALEX (Galaxy Evolution Explorer) mission will do a broad survey of galaxies in various stages of evolution and identify interesting objects for further study by the Hubble Space Telescope.

Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although a finite universe is enough to explain the darkness, the expansion of the universe also contributes. As light travels from a distant galaxy to us, the space through which the light is traveling is expanding. Therefore, the amount of energy reaching us dwindles all the time, thus causing the color of the radiation to be "redshifted." (The wavelength is stretched out due to cosmic expansion.) The more distant the galaxy, the more redshifted the light. The largest redshift astronomers have measured comes from radiation that was emitted when the Universe was only 300,000 years old. This radiation has taken over 12 billion years to reach us and although it began as infrared radiation, it is now seen as the microwave background radiation.

GALEX (Galaxy Evolution Explorer) is a NASA space telescope that will survey the universe, including galaxies with redshifts that indicate their light has been traveling for up to 10 billion years (or 80% of the history of the universe). Read about GALEX at www.galex.caltech.edu. For budding astronomers, print out The Space Place New Millennium Program calendar at spaceplace.nasa.gov/calendar.htm to identify great sky watching opportunities.

Diane K. Fisher is the developer and writer for The Space Place web site.

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

What's Up *by Debbie Dyke*

All times Pacific Standard unless otherwise noted.

February

9	Sun	**First Quarter Moon** 3:11 a.m.
13	Thurs	1852 Johann Dreyer, compiler of the NGC catalogue, born.
14	Fri	Valentine's Day.
15	Sat	1564 Galileo Galilei born.
16	Sun	**Full Moon** 3:51 p.m.
17	Mon	Uranus at superior conjunction (far side of the Sun).
18	Tues	1930 Clyde Tombaugh discovers Pluto. 1977 The Enterprise (first Space Shuttle) takes a ride on the back of a 747.
19	Wed	Look for the Zodiacal Light in the west during the next two weeks. 1473 Nicolaus Copernicus born.
20	Thur	1962 John Glenn becomes the first American in space. Science Fun Fair at the Pleasanton fairgrounds. See page 2 for more information.
21	Fri	**Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.
23	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. **Last Quarter Moon** 8:46 a.m.
24	Mon	**Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore. Mars 1.9° north of the Moon at 3:00 a.m. 1968 Cambridge University astronomers announce discovery of pulsars.
25	Tues	1972 Luna 19 goes to the Moon and brings back rock samples.
27	Thur	Venus 5° north of the Moon at 3:00 a.m.
28	Fri	1994 Clementine spacecraft begins mapping the lunar surface.

March

2	Sun	**New Moon** 6:35 p.m.
4	Tues	1774 First recorded observation of the Orion Nebula by W. Herschel.
5	Wed	1979 Voyager 1 flies past Jupiter and captures first detailed images of it and its moons. 1982 Venera 14 lands on Venus. Muharram, Islamic year 1424
6	Thurs	1986 Vega 1 spacecraft encounters Comet Halley.
7	Fri	1792 John Herschel born.
9	Sun	1986 Vega 2 spacecraft encounters Comet Halley.
10	Mon	**First Quarter Moon** 11:15 p.m. 1977 James Elliot discovers the rings of Uranus.
11	Tues	Saturn 3° from the Moon 4:00 a.m.
13	Thurs	1781 Wilhelm Herschel discovers Uranus using a 6-inch scope he built himself.
14	Fri	Jupiter 4° from the waxing gibbous Moon. 1879 Albert Einstein born. 1986 Giotto spacecraft encounters Comet Halley.

Calendar of Events *continued*

Senator Glenn will talk about his life as a NASA astronaut and narrate his 1998 Space Shuttle Mission video. He will also talk about his current service learning initiative through the John Glenn Institute. A question and answer session will follow.

The evening will also feature the Oakland Youth Chorus and an ice cream social, compliments of Fenton's Creamery.

Seating is limited. Call 510-336-7373 or purchase tickets online through TicketWeb.

March 4, 7:30 p.m.
What: *Dark Matter and Black Holes: Shedding Light on Galaxy Formation.*
Who: Dr. Karl Gebhardt (University of Texas at Austin)
Where: Morrison Planetarium, S.F.
Cost: $3

In the past ten years, we have made enormous strides in our knowledge of how galaxies form and evolve. In particular, two essential components of nearly all galaxies are supermassive black holes at their centers and the dark matter that dominates the outer regions. These are extremely difficult to study since neither gives off any light, yet they are key elements to any theoretical model for how galaxies form. After tremendous efforts from the largest ground-based and space-based observatories, a common picture is beginning to emerge. We are living in a special time in which we are quickly unraveling secrets to the mysteries of galaxy formation.

March 5, 7:00 p.m.
What: *What Happens After Contact: Responding to a Message from Space*
Who: Dr. Seth Shostak (SETI Institute)
Where: Smithwick Theater, Foothill College
Cost: Free

Dr. Shostak, who is Senior Astronomer at the Search for Extra-Terrestrial Intelligence (SETI) Institute in Mountain View, will discuss what plans scientists have if they detect a radio message from an alien civilization out among the stars. He will examine how any such messages will be verified (to avoid hoaxes), how the news will be announced, how information from the message would be disseminated, and how humanity might decide whether and how to reply.

Dr. Shostak is renowned for his ability to explain astronomical ideas (and their implications for society) in everyday language and is the author of *Sharing the Universe: Perspectives on Extra-terrestrial Life.*

Foothill College is located on El Monte Road off of Freeway 280, in the Los Altos hills. There is a parking fee—bring lots of quarters with you. Call the series hotline at 650-949-7888 for more information.

2002-2003 Questionnaire

If it's membership renewal time, it must also be Questionnaire time. We've streamlined the Questionnaire a bit, so hopefully we'll get a few more responses than we ordinarily do. If you need more space to write, feel free to continue your comments on another piece of paper.

1. What kind of instrument do you use the most for observing? _____

_____

2. What program topics would you like us to cover at the meetings? _____

_____

3. Are there any books, DVDs, etc., you would like to see added to the TVS library? _____

_____

4. Do you have any suggestions about ways that the club could be improved, about activities you would like us to provide, etc.? _____

_____

5. Are there any articles, features, etc., you would like to see in the newsletter? _____

_____

6. Would you be interested in participating in a weekend public star party at Camp Shelly (Lake Tahoe) in the summer of 2003? _____

7. Would you be interested in participating in an telescope making workshop in the spring of 2003? _____

_____

8. What improvements would you like to see at our dark sky site, H2O? _____

_____

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.
_____ $29.95 Subscription to *Sky & Telescope* magazine.
_____ $29 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.