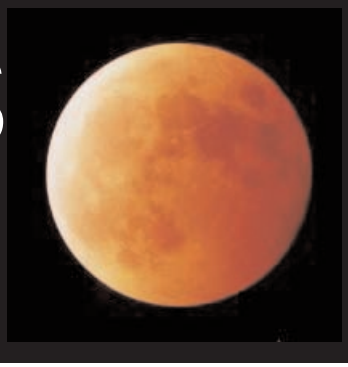
PRIMEFOCUS

Tri-Valley Stargazers

May 2003



TVS Tri-Valley Stargazers

Meeting Info:

What
How to Collimate Your Scope

Who
TVS Members

When
May 16, 2003
Conversation at 7:00 p.m.
Main Lecture at 7:30 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

May Meeting

How to Collimate Your Scope

TVS Members

Having a properly collimated telescope is very important to getting the best view possible with a telescope. For refractor owners, collimation is done at the factory and there shouldn't be any adjustments necessary from the owner. But for those who own a Newtonian reflector or a Schmidt-Cassegrain telescope (SCT), even though the telescope is collimated at the factory, it still needs periodic adjustment by the owner to maintain proper collimation. For those who are new to the hobby, or new to a Newt or SCT, collimation can be confusing and a bit intimidating. You can find instructions on how to collimate, but you're not always certain if you're doing it right, and the instructions can't respond to your questions.

Tonight will be your chance to ask questions that will get answered. You'll also get hands-on training in collimating a scope. We will watch a short video on collimation, then talk about the tools you'll need to successfully collimate your scope. We'll have our loaner scopes out for the collimation demonstration, and will allow everyone to try their hand at collimating the scope themselves. If you like, bring your scope to the meeting and we'll help you collimate it. Once you've learned the in's and out's of collimation, you should be able to successfully collimate your own scope.

Total Lunar Eclipse This Month

Mark your calendar and set your watch. Barring any clouds, Thursday May 15, the Bay Area will witness a total lunar eclipse. Find yourself an unobstructed view to the east, as totality occurs just 6 minutes after the Moon rises. You'll have about 50 minutes to view and photograph the totally eclipsed Moon, but it will still be very low on horizon throughout the eclipse. See below for all the important details.

Penumbral eclipse begins	6:05 p.m.	below the horizon
Partial umbral eclipse begins	7:03 p.m.	below the horizon
Moon rise	*8:08 p.m.*	*on the horizon*
Total umbral eclipse begins	**8:14 p.m.**	**0° 47.5' above the horizon**
Total umbral eclipse ends	9:07 p.m.	8° 45.5' above the horizon
Partial umbral eclipse ends	10:17 p.m.	18° 32.7' above the horizon
Penumbral eclipse ends	11:15 p.m.	25° 17.7' above the horizon

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News & Notes

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 July 6th deadline is for the July issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
May 16	May 19	May 5
June 20	June 23	June 9
July 18	July 21	July 6

Money Matters

At the April Board meeting, Treasurer **Gary Steinhour** gave us the scoop as to the account balances (as of April 21, 2003) of several TVS accounts:

Checking	$1,332.61	
CD #1	$3,904.04	matures 05/17/03
CD #2	$2,409.33	matures 05/27/03
CD #3	$2,056.40	matures 07/16/03

Meet Nellie, the 36" Telescope

Construction of Chabot's new 36" telescope is getting closer and closer to completion. When finished, it will be one of the largest reflector telescopes available on a regular basis to the public in the United States.

The telescope is an f/8 classical Cassegrain that will be housed in a roll-off roof observatory. With an optical tube only seven feet long, the average height above the floor for the viewing eyepiece will be around five to six feet.

The telescope will be fully computer-controlled and equipped with a digital CCD camera. The photos will then be accessible through Chabot's website. The telescope and observatory, funded in part through a generous donation from Merrill and Lillian Martin of Oakland, will be named "Nellie" after Mr. Martin's grandmother and youngest daughter.

Nellie's fork arm. Merrill Martin, the major donor for the construction of Nellie, is on the right.

The public grand opening for Nellie is scheduled for Saturday, June 21, 8:00 p.m. to midnight, to coincide with the summer solstice. Tickets to the event are $8.00 Adult/$5.50 Youth & Senior, and includes admission to a planetarium show, hands-on activities, exhibits and telescope viewing. Tickets may be purchased at ticketweb.com or the Chabot box office, 510-336-7300

Still Counting Jupiter Moons

In last month's issue, it was reported that the Jupiter moon count was up to 58. At press time, it is now up to 60. The latest two discoveries are from the same team that has been bringing you all the most recent additions to the Jupiter family.

You can find more information about the new moons by visiting http://www.ifa.hawaii.edu/~sheppard/satellites. Besides having links to info on the new Jupiter moons, they also have a link to info on a new Saturn moon that they discovered.

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:

War of the Worlds (1953), July 4-6
Mars Attacks (1996), August 1-3

Showtimes:

Friday – Sunday on the first weekend of each month.

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

Newsletter header image: Total lunar eclipse.

This picture of a total lunar eclipse was taken on September 26, 1996 in Livermore. It was taken prime focus, using a C8 with a reducer; 2000mm, f/6, 1 second exposure using Kodak Gold 400 ASA film.

Photo: Debbie Dyke

Calendar of Events *continued*

May 15, 6:30 p.m.
What: *The History & Lore of Lunar Eclipses*
Who: Dr. Mike Reynolds
Where: Chabot Space & Science Center, Oakland.
Cost: $5

Join Chabot's resident eclipse expert to learn about the history of lunar eclipse lore and culture, and hear tales of modern-day eclipse observing. Afterward, come outside with staff astronomers to view a beautiful total eclipse of the full moon as it rises over the eastern tree line at Chabot. Telescopes will be at hand for additional observing

May 21, 7:00 p.m.
What: *Seeing in the Dark: How Backyard Astronomers are Probing Deep Space and Guarding Earth from Interplanetary Peril*
Who: Timothy Ferris
Where: Smithwick Theater, Foothill College at El Monte Road and Fwy. 280 in the Los Altos hills.
Cost: Free, although it costs $2 to park (in quarters).

Tim Ferris (the award winning author and PBS commentator) will discuss the contributions amateur astronomers are making to the field of astronomy — from the discovery of new comets and exploding stars to the search for old asteroids that might collide with our planet. New technologies, within the reach of even modest budgets, have transformed the hobby of astronomy in recent years, and Tim Ferris has chronicled these developments for the New Yorker and for his widely-praised new book *Seeing in the Dark* (which he will be signing after the lecture).

His talk will be followed by a public star party at the Foothill College Observatory, with telescopes and guidance provided by the Peninsula Astronomical Society.

Please bring a jacket or sweater if you are staying for the star party afterwards. Amateurs are invited to set up their own telescopes.

This talk is part of the Silicon Valley Astronomy Lecture Series. Call the series hotline at 650-949-7888 for more information.

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

May 23, 8:00 p.m.
What: *Aurora of the Northern Harp*
Who: Aryeh Frankfurter
Where: Chabot Space & Science Center, Oakland.
Cost: $15 general; $12 for Chabot Members, kids, seniors & students. Kids 3 and under free.

Let the wistful and haunting melodies of Celtic harpist Aryeh Frankfurter transport you into the world of the Northern skies. Accompanied by a stringed-instrument ensemble, Aryeh will perform traditional folk music of Ireland and Scandinavia while the simulated night sky swirls above on the planetarium dome. The lyrical warmth of the music and evocative visual multimedia effects promises an unforgettable evening of beauty, romance and dream.

Aryeh's uncommon approach to the Celtic harp has gained him international recognition and he performs regularly in the Bay Area and Sweden. He is the owner and operator of Lionharp Music, an independent record label whose purpose is to support and encourage diverse musical endeavors.

Seating is limited. Tickets may be purchased in advance at www.ticketweb.com or at the Chabot Box Office 510-336-7373.

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Astro Events

Jupiter Transits

Below 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

Date	Object	Starts	Transits	Ends
Wed 7	Es	8:21p	9:30p	11:09p
	GRS	10:30p	12:20a	na
Thurs 8	GRS	na	8:10p	10:05p
Sat 10	GRS	12:05a	na	na
	GRS	na	9:50p	11:50p
	I	8:55p	10:00p	11:07p
	Is	10:07p	11:07p	12:20a
Mon 12	GRS	9:35p	11:35p	1:35a
Wed 14	E	8:30p	9:50p	11:20p
	Es	10:58p	12:10a	na
	GRS	11:10p	1:05a	na
Thurs 15	GRS	na	9:00p	11:00p
Sat 17	Gs	na	na	9:50p
	GRS	8:50p	10:45p	12:30a
	I	10:50p	11:55p	1:05a
Sun 18	Is	12:02a	1:00a	na
Mon 19	Is	na	na	8:45p
	GRS	10:30p	12:20a	na
Thurs 22	GRS	na	9:45p	11:45p
Sat 24	GRS	9:35p	11:30p	na
	Gs	10:13p	11:45p	na
Sun 25	I	12:48a	na	na
Mon 26	I	na	na	9:33p
	Is	na	9:25p	10:40p
	GRS	11:15p	na	na
Tues 27	GRS	na	9:00p	10:50p
Thurs 29	GRS	8:45p	10:45p	12:45a
Fri 30	C	10:50p	na	na
Sat 31	G	9:40p	11:20p	na
	GRS	10:30p	12:20a	na

June

Date	Object	Starts	Transits	Ends
Mon 2	I	9:16p	10:20p	11:30p
	Is	10:20p	11:20p	na
Tues 3	GRS	na	9:50p	11:50p
Thurs 5	GRS	9:30p	11:30p	na
Sat 7	GRS	11:10p	na	na
Sun 8	GRS	na	na	10:50p
	Es	na	na	10:55p
Mon 9	I	11:15p	na	na
Tues 10	GRS	na	10:40p	na

Star Parties

Here are some upcoming star parties:

Riverside Telescope Maker's Workshop (RTMC)
May 23-25

As always, RTMC takes place over the Memorial Day weekend. This year's topic is home observatories. For general info or last minute registration, visit their web site at http://www.rtmc-inc.org.

H2O Open House
June 21; July 19; September 20

For TVS members who would like to check out our club's dark sky site, the H2O Open House offers them just that chance. More info in the next newsletter.

Shingletown Star Party 2003
June 25-30

Shingletown is 17 miles from Mount Lassen Volcanic National Park. A public star party and community BBQ with the people of Shingletown and Shasta County. The star party takes place on a closed airstrip.

For information, images and more, visit their web site at http://www.shingletownstarparty.org.

Yosemite
July 3-5

TVS will host public star parties on Glacier Point in exchange for free park entrance and camping for up to thirty people. Fabulous views of the heavens and the earth. Contact **Dave Rodrigues** to reserve a spot on this trip. DaveVRod@aol.com or 510-483-9191.

White Mountain High Altitude Star Party
July 24-27

View celestial wonders in a very dark, low oxygen environment, with wonderful food to boot.

The annual low oxygen star party will be held again this summer at the Barcroft Lab (altitude 12,435') in the White Mountains northeast of Bishop, CA. We will have up to 5 nights of observing from this outstanding site.

This is a joint activity of TVS and the EAS (Eastbay Astronomical Society).

The schedule calls for assembling at the Grandview Campground (8,600') the night of Thursday, July 24. This is an important stopover to begin adjusting to the altitude. If you don't want to camp out there we strongly encourage spending the night at Mammoth Lakes, which is about 8,000' elevation. On Friday, July 25th we go up past the Bristlecone pines to Barcroft. Many people will stay there for 3 nights and return home on Monday, but a few people are planning to stay until Wednesday. The longer the stay the better the chance of good weather and the easier it gets to do almost anything at that altitude.

The Barcroft Lab is a research facility and there are usually scientists there conducting high-altitude studies. Meals and bunk beds are provided for $55/day/person.

We are limited to 20 people, so priority will be given to those staying 3 nights or more. Send your check, payable to Dave Rodrigues, to Dave at 1633 Graff Ct., San Leandro, CA 94577. If you have any questions, contact Dave at 510-483-9191 or davevrod@aol.com.

NASA's Space Place

In Search of Alien Oceans

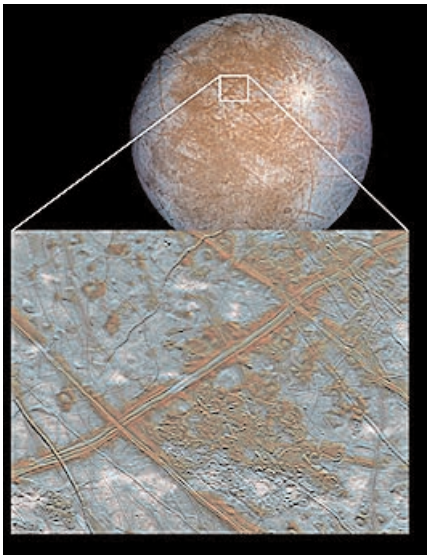
by Patrick L. Barry and Dr. Tony Phillips

A robotic submarine plunges into the dark ocean of a distant world, beaming back humanity's first views from an alien ocean. The craft's floodlights pierce the silty water, searching for the first, historic sign of extraterrestrial life.

Such a scenario may not be as fantastic as it sounds. Many scientists believe that Jupiter's moon Europa conceals a vast ocean under its icy crust. If so, heat from the moon's interior — which would keep the ocean from freezing solid — may also drive subaquatic volcanoes and hydrothermal vents. On Earth, such deep-sea vents provide chemical energy for ecosystems that thrive without sunlight, and some scientists even suggest that Earthly life first got started around these vents.

So a warm Europan ocean spotted with thermal vents could be a natural incubator for life. That's why some scientists hope that someday we will send a probe to Europa that could bore through the ice and explore the ocean below like a submarine.

To plan for such a mission, scientists would first need to put a camera in orbit around Europa. By looking for places where water has welled up to fill the spindly cracks



Cracks on the icy surface of Jupiter's moon Europa give evidence of a liquid ocean below.

that riddle Europa's surface, scientists can estimate where the ice is thinnest–and thus easiest to bore through.

That mission scenario presents a problem, though. Europa orbits Jupiter inside the giant planet's punishing radiation belts. Continuous exposure to such high radiation would damage today's scientific cameras, making the information they gather less reliable and perhaps ruining them completely.

That's why NASA is designing a more radiation-tolerant CCD that could be used on a mapping mission to Europa. A CCD (short for "charge-coupled device") is a digital camera's chip-like core, which converts light into electric signals.

"We've seen the effects of this radiation during the Galileo mission to Jupiter," says JPL's Andy Collins, principal investigator for the Planetary Imager Project. "Galileo has orbited Jupiter for many years, dipping inside the radiation belts only for brief intervals. Even so," he says, "we've seen clear signs of damage to its instruments."

By using the hardier CCD's developed by the Planetary Imager Project, a future probe could remain in Jupiter's radiation belts for many months, gathering the maps scientists will need to finally get a peek behind Europa's icy veil. And who knows, maybe there will be something peeking back!

To learn more about the Galileo mission to the Jupiter system, visit http://www.jpl.nasa.gov/galileo/.
For children, a fun, interactive "Pixel This!" game at http://spaceplace.nasa.gov/p_imager/pixel_this.htm introduces CCDs and how a really tough one will be needed for a future mission to Europa.

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 Daylight Savings Time unless otherwise noted.

May

1	Thurs	Moon at apogee (252,047 mi/406,529 km) 1:00 a.m. **New Moon** 5:15 a.m.
5	Mon	Eta-Aquarid meteors peak at 4:00 a.m.
7	Wed	Mercury in inferior conjunction as it transits across the Sun (transit not visible in the Bay Area).
8	Thurs	The waxing crescent Moon passes north of Jupiter in the evening sky.
9	Fri	**First Quarter Moon** 4:53 a.m.
10	Sat	**Astronomy Day!** 1910 The Earth passes through comet Halley's tail
11	Sun	Mother's Day.
15	Thurs	Moon at perigee – large tides expected (221,618 mi/357,449 km) 9:00 a.m. **Full Moon** 8:36 p.m. **Total lunar eclipse visible from the Bay Area!**
16	Fri	**Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.
18	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.
19	Mon	**Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.
22	Thurs	**Last Quarter Moon** 5:31 p.m. The Moon passes south of Mars in the early morning sky.
23	Fri	Riverside Telescope Makers Conference begins. Conference ends on Sunday, 25th.
26	Mon	Memorial Day
27	Tues	Mercury and Venus, just over 2° from each other, are in conjunctions 22° west of the Sun, low in the eastern horizon in the early morning sky.
28	Wed	Moon at apogee (251,824 mi/406,168 km) 6:00 a.m. Moon passes close by Venus and Mercury in the early morning sky.
29	Thurs	The waning crescent Moon passes 4° by Venus and 6° by Mercury in the early morning sky. 1919 Einstein's theory of general relativity is tested for the first time during a total solar eclipse.
30	Fri	**New Moon** 9:20 p.m. Annular eclipse of Sun visible from Iceland (4:20 UT on the 31st). 1966 Surveyor 1 makes the first soft landing on the Moon.

June

1	Sun	Double shadow transit on Jupiter 3:49 a.m.
2	Mon	Mercury at greatest elongation west (24°) 11:00 p.m.
4	Wed	The waxing crescent Moon, Jupiter, and the Beehive Cluster make a nice little triangle in the evening sky. 1948 Dedication of the 200-inch scope on Mt. Palomar.
6	Fri	The Moon is just 1° away from M95, M96 and M105 in Leo; occulting M105 at 11:40 p.m.
7	Sat	**First Quarter Moon** 1:28 p.m.
9	Mon	Pluto at opposition (2,749 million mi/4,435 million km from Earth) 2:00 p.m. 1812 Johanne Galle (Neptune discoverer) born.
12	Thurs	Moon at perigee (223,463 mi/360,425 km) 4:00 p.m.

Calendar of Events *continued*

May 27, 7:30 p.m.
What: *The Farthest Stars*
Who: Dr. Charles Liu (American Museum of Natural History)
Where: Morrison Planetarium, S.F.
Cost: $3

How did the first galaxies form? That depends on the stars in those galaxies. All right, then: how did the first stars form? The answer to that question can be found only when we find the farthest stars, whose light first shone nearly 13 billion years ago. In our quest to find those first points of light in the cosmos, we are learning not only about stars and galaxies, but also the universe itself — how it began, how it has aged, and how it will most likely end.

May 31, 8:30 p.m.
What: *How Stars Are Made*
Who: Dr. Steve Stahler (UC Berkeley)
Where: Mt. Tam.
Cost: $3

How stars form out of diffuse gas clouds is a central problem of astronomy — one that has witnessed remarkable progress within the last few decades.

The lecture is held in the Mountain Theater, telescope viewing in the Rock Springs parking area. For more information and directions, call 415-455-5370 or 415-388-2070, or visit www.mttam.net.

Astronomical Insights
by David Feindel

April has not been good to local astronomers; the fourth rainiest April on record. The reason — the curse of the new telescope. I was successful in finding a slightly-used LX-90 through astromart; I thought that buying a 'scope that had already seen first light invalidated the curse of two weeks of clouds immediately after anyone buys new optics. No it doesn't. But the two week curse ends May 4, so… I've updated the software, loaded current ephemerides for satellites, fussed with aligning the finder scope and training the motors, and everything but look at stars. Both nights I've tried had horrible seeing and not terribly good transparency, so I don't even know how well it is collimated. Jupiter, near zenith, was a blur at anything over 100x, and this 'scope should be able to support 400x on nights of very good seeing. It's even been difficult to find clear enough skies to check out the solar filter, a "throw-in" in the deal. But I'm hoping Cecil (everyone does name their telescope, don't they?) proves to be a good deal once the skies clear up. The first night's observing list is already developed — doubles and galaxies in Ursa Major — all that's wanting is reasonably good conditions.

This month's book is *On the Moon*, by Patrick Moore. Not quite sure why, but this book left me a bit "ho hum". Moore is a prolific writer and popularizer of astronomy. Perhaps its just that I'm not a "lunatic". I'm hoping for better luck with the next book on the pile, *Deep Sky Wonders*.

This month's astronomical travel destination is the Danish National Science Museum, in Aarhus, Denmark. Denmark's most famous astronomer, of course, is Tycho Brahe, the last of the great pre-telescope astronomers. But that doesn't mean that he didn't have some sophisticated equipment (at least for his time, c.1570-1601). He built his observatory on a small island, Hven, about 30 miles north of Copenhagen, and called it Uraniborg. Unfortunately, it was destroyed a long time ago; the Swedish government is only partway through the process of re-creating it as a park/museum. What does exist are detail drawings of his observatory and equipment. Craftsmen have used these to build (relatively) faithful replicas of most of his equipment, including his 1.55m equatorial armillary, shown here. (I'm not sure that Brahe had access to the steel that appears to be used in the angular scale in this replica, but the quality of the woodworking is superb.) The museum also had replicas of his mural quadrant and astronomical sextant. For more information on Brahe and his accomplishments, look at *On Tycho's Island* by J.R. Christianson, and http://home.swipnet.se/~w~72659/INDEXE.html and www.landskrona.se/kultur/tychobrahe/p8.html.


A replica of Tycho Brahe's armillary.

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.