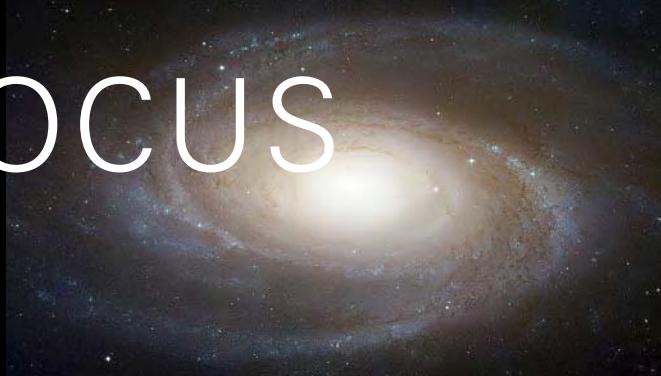


PRIMEFOCUS

Tri-Valley Stargazers



July 2007



Meeting Info:

What

LIGO and the Search for Gravitational Waves

Who

Peter Beyersdorf

When

July 20, 2007
Doors open at 7:00 p.m.
Lecture at 7:30 p.m.

Where

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

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July Meeting

LIGO and the Search for Gravitational Waves
Peter Beyersdorf, San Jose State University

The Laser Interferometer Gravitational Wave Observatory (LIGO) seeks to observe parts of our universe not detectable by conventional electromagnetic telescopes, and in the process shed light on the mysteries of some of the most energetic events in the universe including collisions of black holes, supernova and the big bang. In the process the predictions of Einstein's general theory of relativity will be tested at unprecedented levels. This talk will address the physics of gravitational radiation, the equipment used to detect it, and the scientific results already obtained by LIGO in its early observations.

Kingsley Wightman, 1916 - 2007

Kingsley Wightman, Chabot Science Center astronomy instructor and un-official director passed away on July 5th after a long illness. Kingsley started working at Chabot in 1948, and worked tirelessly until his retirement in 1994.

As a long-time volunteer at the Chabot Space & Science Center, I had the privilege to meet Kingsley. There are hundreds of thousands of people that visited Chabot during his tenure, delighting in his science demonstrations (I distinctly remember his liquid nitrogen and 'how a hydrogen balloon reacts to an open flame' demos), his descriptions of the objects that were on view through Chabot's telescopes, and the telescopes themselves if it was cloudy. Kingsley touched countless lives with his enthusiasm and love for science.

The public is invited to attend a funeral mass for Kingsley on July 20th at 10:00 a.m. at the Our Lady of Lourdes Church, 2808 Lakeshore Avenue, Oakland. That evening from 6:00 to 8:00 p.m. at Chabot is a Celebration Reception honoring Kingsley's life, hosted by the Wightman family. Guests are invited to enjoy the Center's interactive exhibits and telescope viewing until 10:00 p.m. Chabot is located at 10000 Skyline Blvd., Oakland, CA 94619.

In lieu of flowers, the family requested a memorial fund be set up in his name at Chabot. If you would like to make a donation to the fund, you may forward a check made out to Chabot Space and Science Center Foundation. Please write "Kingsley Wightman" in the notes section of your check, or enclose a note to that effect. In order for them to properly acknowledge your generosity, please let them know your full name and address. Please mail your check to: Chabot Space & Science Center, Attn: Kingsley Wightman Memorial Fund, 10000 Skyline Boulevard, Oakland, CA 94619.

If you would like to send cards and sympathy messages directly to the family you may do so by e-mail: danboy21 [at] comcast.net or by mail: 5041 Dublin Avenue, Oakland, CA 94602.

News & Notes

2007 TVS Meeting Dates

The following lists the TVS meeting dates for the next few months. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month's issue (e.g., the August 5th deadline is for the August issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
July 20	July 23	July 8
Aug. 17	Aug. 20	Aug. 5
Sept. 21	Sept. 24	Sept. 9

Money Matters

At our June board meeting, Treasurer, **David Feindel** reported the TVS account balances (as of June 18, 2007):

Checking	\$3,901.92
CD #1	\$3,629.19
CD #2	\$2,557.42

matures 08/17/07
matures 08/27/07

Club Star Party Trips



The July H2O Open House had clear skies, but not many members made the trip to the site. Dave Woolsey was able to snag this shot of Jupiter (actually, 12 of them stacked together).

The Yosemite Star Party takes place during the Labor Day weekend (August 31st through September 2nd).

The White Mountain/Barcroft high altitude trip is from September 4th through the 15th, with a final departure date of the 16th. The cost is \$63 per person per day, which includes room and board. Attendees can choose how many days they would like to stay.

If you need more information, or want to sign up for either trip, contact **Dave Rodrigues** at 510-483-9191.

Mark Your Calendars

SEEING IN THE DARK: A film by Timothy Ferris

America's Writer Laureate of astronomy invites millions of viewers to enjoy the wonders of the night sky in a spectacular HDTV special on PBS.

Stargazing is the subject of *Seeing in the Dark*, a 60-minute, state-of-the-art, high-definition (HDTV) documentary by Timothy Ferris that premieres September 19, 2007 at 8:00 p.m. on PBS (check local listings). The film, Ferris's third, is based on his book, *Seeing in the Dark* (2002), named by The New York Times as one of the 10 best books of the year.

"*Seeing in the Dark* is meant to alter, inspire and illuminate the lives of millions," said Ferris. "It introduces viewers to the rewards of first-person, hands-on astron-

omy - from kids learning the constellations to amateur astronomers doing professional-grade research in discovering planets and exploding stars. I hope it will encourage many viewers to make casual stargazing part of their lives, and a few to get into serious amateur astronomy."

The "amateur astronomers doing professional-grade research in discovering planets" he mentions is our own Ron Bissinger! As you might recall, Ron wrote about his experience filming this documentary (July 2006 Prime Focus).

Astro Events

Jupiter Transits

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

July

Fri 13	E	10:24p	11:41p	12:58a
Sat 14	Es	12:03a	1:13a	2:38a
	Gs	8:39p	9:48p	11:04p
	GRS	11:17p	1:19a	na
Sun 15	GRS	na	9:09p	11:08p
Tues 17	GRS	8:39p	10:43p	12:50a
	I	11:53p	12:57a	2:04a
Wed 18	Is	12:46a	1:45a	2:56a
Thurs 19	Is	na	na	9:25p
	GRS	10:30p	12:20a	2:09a
Fri 20	GRS	na	8:19p	10:09p
Sat 21	E	12:45a	2:07a	na
	Es	2:40a	3:50a	na
	G	8:52p	10:00p	11:07p

continued page 5

Newsletter header image: M81 (NGC 3031 or Bode's Galaxy).

The spiral galaxy M81 is located in the constellation of Ursa Major, and is about 11.6 million light-years away. It can be seen with binoculars.

The image was taken with the Advanced Camera for Surveys on board the Hubble Telescope in 2004 through 2006. This color composite was assembled from images taken in blue, visible, and infrared light.

Credit: NASA, ESA, and The Hubble Heritage Team (STScI/AURA)

Acknowledgment: A. Zezas and J. Huchra (Harvard-Smithsonian Center for Astrophysics)

Calendar of Events

July 21, 8:30 p.m.

What: *Life as an Astronaut: Highlights of STS-99*
Who: Dr. Janice Voss (NASA-Ames Research Center)
Where: Mt. Tam Mountain Theatre
Cost: Free

Shuttle Mission STS-99, launched on Feb 11, 2000, was Dr. Voss' fifth space flight. Dr. Voss will describe the mission and other aspects of life as an astronaut.

Carpool with your friends, bring flashlights and dress warmly. It can be cold sitting on rocks! All programs are free, and we encourage you to bring students and family members of all ages. Telescope viewing will follow the program, weather permitting, until about 11:00 p.m. in the Rock Springs Parking Lot.

If the weather is questionable on the day of the program, call the SFAA hotline at 289-6636 (the Astronomy hotline will not be changed on this program). Usually the program goes even if the sky is not inviting for observing. And remember that when the fog comes in we are usually above it and welcome it to block out the lights of San Francisco.

Programs sponsored by your State Park, organized by the Mount Tamalpais Interpretive Association with viewing conducted by the San Francisco Amateurs. More information and directions are at www.mttam.net.

July 27, 8:00 - 11:00 p.m.

What: *Lunar Lounge Express*
Who: You
Where: Chabot Space & Science Center, Oakland
Cost: Lunar Lounge: \$15 Adult, \$10 Student, \$8 Member
Lunar Lounge + Mission: \$23 Adult, \$18

Student, \$16 Member.

For reservations, call 510-336-7373

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

The Lunar Lounge Express

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

Special coffee tastings provided by the AfricaJack Foundation. The AfricaJack Foundation provides resources and funding to build Learning Centers at HIV orphanages in Sub-Saharan Africa.

The musical act for the evening is Sheppard's Krook, acoustic rock/funk with a little bit of jazz mixed in.

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

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

Comet Collision

Don't miss your chance to embark on a daring exploration of comets aboard a spacecraft! The mission's objective is to plot a course to rendezvous with a comet and launch a probe to collect scientific data. Drinks will be served during the mission briefing. To complete your mission, your team of astronauts must overcome any unforeseen challenges and unexpected emergencies. The Mission lasts for one hour.

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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.

What's Up *by Debbie Dyke*

All times Pacific Daylight Time.

July

- 7 Sat **Last Quarter Moon.** 9:54 a.m.
- 14 Sat **New Moon.** 5:04 a.m.
- 16 Mon The waxing crescent Moon is sandwiched in between Venus and Saturn low in the west. 9:00 p.m.
1994 Comet Shoemaker-Levy 9 begins plunging into Jupiter. The plunging continues through the 20th.
- 17 Tue 1850 First photo of a star (Vega).
- 18 Wed 1984 Svetlana Savitskaya becomes the first woman to take a walk in space.
- 19 Thur 1846 Edward Pickering born.
- 20 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,
1893 N. Vasco Road, Livermore.
Mercury at greatest elongation west (20°). 8:00 a.m.
1969 Apollo 11 lands at Tranquillity, placing the first men on the Moon.
1976 Viking 1 makes first robotic landing at Chryse Planitia on Mars.
1999 Space capsule Liberty Bell retrieved from the bottom of the ocean.
- 21 Sat Spica 4.5° north of the Moon. 9:00 p.m.
First Quarter Moon. 11:29 p.m.
1925 John Scopes convicted for teaching evolution.
- 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.
Moon at apogee (250,573 miles). 2:00 a.m.
1972 Venera 8 makes the first soft landing on Venus.
- 23 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza in Livermore.
1995 Alan Hale discovers his half of Comet Hale-Bopp.
- 28 Sat Look for Mercury low in the ENE skies just before sunrise. It will remain visible in the morning for the
next week.
S. Delta Aquarid meteor peak. 6:00 a.m.
1851 First photo taken of a solar eclipse—the corona is discovered.
- 29 Sun **Full Moon.** 5:48 p.m.
- 30 Mon Neptune 3° north of the Moon. 11:00 p.m.
1971 Apollo 15 lands on the Moon. The next day, the astronauts Scott and Irwin take a little spin in the
Lunar Roving Vehicle.
- 31 Tue 1774 Oxygen is discovered. Everyone takes a deep breath of relief.
1964 Ranger 7 impacts Moon, taking the first close-up views of the Lunar surface.

August

- 1 Wed 1818 Maria Mitchell born. She receives a gold medal from the king of Denmark for being the first to
discover a comet.
- 3 Fri Moon at perigee (228,712 miles). 5:00 p.m.
- 5 Sun Mercury at perihelion.
Last Quarter Moon. 2:20 p.m.
- 8 Wed Mercury in front of the Pleiades. 6:00 a.m. (Doubtful M45 will be visible.)
St. Dominic - patron saint of astronomers.
- 11 Sat 1877 Asaph Hall Sr. discovers Mars' moon Deimos.
- 12 Sun 1977 Prototype shuttle Enterprise makes its first free flight.

Chew On This

by Diane K. Fisher

The Mars robotic rovers, Spirit and Opportunity, are equipped with RATs, or Rock Abrasion Tools. Their purpose is to abrade the surface patina off the Mars rocks so that the alpha x-ray spectrometer can analyze the minerals inside the rocks, rather than just on the surface.

But future robotic missions to Mars will be asked to go even further below the surface. Scrapers and corers will gather rock samples of substantial size, that, in order to be analyzed by a spectrometer, will need to be crushed into a fine powder.

Crushing rocks on Mars? Now there's a problem that brings to mind a multitude of possible approaches: Whack them with a large hammer? Squeeze them until they explode? How about just chewing them up? It was with this latter metaphor that the planetary instrument engineers struck pay dirt—so to speak.

Thanks to NASA's Planetary Instrument Definition and Development Program, a small group of NASA engineers came up with the Mars Rock Crusher. Only six inches tall, it can chew the hardest rocks into a powder.

The Mars Rock Crusher has two metal plates that work sort of like our jaws. One plate stays still, while the other plate moves. Rocks are dropped into the jaw between the two plates. As one plate moves in and out (like a lower jaw), rocks are crushed between the two plates. The jaw opening is larger toward the top and smaller towards the bottom. So when larger rocks are crushed near the top, the pieces fall down into the narrower part of the jaw, where they are crushed again. This process repeats until the rock particles are small enough to fall through a slit where the two plates are closest.

Engineers have tested the Mars Rock Crusher with Earth rocks similar to those expected to be found on Mars. One kind of rock is hematite. The rusted iron in hematite and other rocks help give Mars its nickname "The Red Planet." Another kind of rock is magnetite, so-called because it is magnetic. Rocks made by volcanoes are called basalts. Some of the volcanoes on Mars may have produced basalts with a lot of a mineral called olivine. We call

those olivine basalts, and the Rock Crusher chews them up nicely too.

Visit www.jpl.nasa.gov/technology to read the latest about other NASA technologies for exploring other planets and improving life on this one.

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*

Sun 22	GRS	12:10a	2:03a	na
	Gs	12:38a	1:47a	na
	GRS	na	9:56p	11:56p
Tues 24	GRS	9:42p	11:27p	1:24a
Thurs 26	I	na	9:13p	10:20p
	Is	9:10p	10:07p	11:20p
	GRS	11:20p	1:11a	na
Fri 27	GRS	na	9:06p	11:00p
Sun 29	G	12:27a	1:31a	na
	GRS	12:55a	na	na
	GRS	8:45p	10:41p	12:30a

August

Thurs 2	I	9:58p	11:04p	12:10a
	Is	11:04p	11:59p	1:15a
	GRS	11:59p	na	na
Fri 3	GRS	na	9:49p	11:54p
Sun 5	GRS	9:33p	11:29p	1:25a
Tues 7	E	na	9:09p	9:25p
	Es	9:09p	10:17p	11:43p
	GRS	11:10p	1:08p	na
Wed 8	GRS	na	9:00p	10:50p
Thurs 9	I	11:50p	12:55a	na
Fri 10	GRS	12:50a	na	na
	GRS	8:55p	10:40p	12:25a
Sat 11	Is	na	na	9:36p



Looking down on the jaws of the Mars Rock Crusher, we see a magnetite rock get crushed into smaller and smaller particles.

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



PRIMEFOCUS

Tri-Valley Stargazers Membership Application

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

Name _____ Phone _____ e-mail _____

Address _____

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

Membership category: _____ \$5 Student.

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

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

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

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

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

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

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

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

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

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

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