

PRIME FOCUS

Tri-Valley Stargazers

August 2009



Meeting Info:

What

Allen Telescope Array

Who

Garrett Keating

When

August 21, 2009
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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August Meeting

Allen Telescope Array
Garrett Keating

As amateur astronomers, we're used to going out at night to look through our telescopes in order to see all manner of beautiful and interesting objects. But what we see through our telescopes is just a small portion of what's out there in the universe. By using other methods, such as gamma ray, x-ray, and radio telescopes, scientists can get a different view of the universe than what we spy in our telescopes.

Our speaker for this evening has been using radio telescopes to study galaxies, pulsars, and other celestial objects. He has been a part of the every growing conglomeration of radio telescopes called the Allen Telescope Array located near Hat Creek, CA.

The ATA was initially funded by Microsoft co-founder Paul Allen, with the goal to have 350 small radio telescopes working together as one large telescope. Right now, they have the initial 42 telescopes up and running. The ATA is involved with a number of research projects, studying galaxies, gamma ray bursts, transient radio sources, and SETI. The ATA is a joint project of UC Berkeley's Radio Astronomy Lab and the SETI Institute.

The Allen Telescope Array



News & Notes

New Member

TVS welcomes our newest member, **Chris Jackson**.

2009 TVS Meeting Dates

The following lists the TVS meeting dates for the rest of the year. 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 July 5th deadline is for the July issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Aug. 21	Aug. 24	Aug. 9
Sept. 18	Sept. 21	Sept. 6
Oct. 16	Oct. 19	Oct. 4
Nov. 20	Nov. 23	Nov. 8
Dec. 18	Dec. 21	Dec. 6

Money Matters

At the July Board Meeting, Treasurer David Feindel reported the TVS account balances as of July 20, 2009, were:

Checking	\$3,931.87	
CD #1	\$3,757.66	matures 8/17/09
CD #2	\$2,652.35	matures 8/27/09

White Mountain Star Party

This year our dates for the White Mountain trip will be Saturday, September 12 (last quarter Moon) through Sunday, September 20 (two days past new Moon). You do not have to stay for the entire week. However, Barcroft is pretty empty at that time, and if you'd like to extend your stay a bit more, they probably wouldn't mind (as long as they are told in advance).

The cost is \$65/night. That will get you a bed in a dorm-style room, three meals a day (plus snacks), indoor plumbing, and a pool table, all at an altitude of 12,400'. There's even an oxygen tank in the dining hall for your breathing pleasure. What Barcroft lacks in oxygen, it more than makes up for with very dark skies—it's so dark, the Milky Way blazes across the sky, casting shadows.

Deadline for sign up is August 15, although you may still be able to sign up after that date. Due to the high altitude, you have to be 16 years or older to attend. Dave Rodrigues is the coordinator for the trip—510-410-6047.

Fremont Peak State Park to Close

Due to the State's budget cuts, Fremont Peak State Park is threatened with closure, and along with it the public observatory located in the park. The observatory is run by the Fremont Peak Observatory Association (FPOA) and houses a 30" telescope.

State Park officials recently told FPOA that they had to donate \$100,000 to the state by Labor Day in order to keep the park open. Failing that, the observatory and park will be closed. FPOA will have to remove the 30" mirror for safe keeping, which will delay reopening the facility once the park reopens in the future.

FPOA is asking for help in trying to keep the park open. The most effective way is through petitions and letter writing campaigns to legislators. More information about the closure and what you can do to help, please visit the FPOA site at http://www.fpoa.net/Closure/Keep_FPOA_Open.html.

AANC / ASP Conference

The Amateur Astronomers of Northern California (AANC) and the Astronomical Society of the Pacific (ASP) are holding their conjoined conference starting September 12 in Millbrae.

The AANC meeting is only on Saturday the 12th. Events include lectures, workshops, solar viewing, art projects for kids, and a star party at night. The cost is \$39.95 for adults, kids are free (but must be accompanied by an adult). For more information, visit their web site at <http://aacstars2009.org>.

The ASP conference runs from September 12 through the 16th and includes lectures and workshops. Scheduled speakers include Frank Drake, Seth Shostak, Margaret Race, and John Jenkins. Visit <http://www.astrosociety.org/events/meeting.html> for more information.

Volunteers Needed

The Society needs at least six volunteers for each day of the conference. If you work a day as a volunteer, you get registration for that day plus another day at the conference free. Volunteers assist with registration, message boards, audio-visual needs, checking badges, and other meeting-related tasks.

To get on the volunteer list, please email Cindy Hart with your name, contact information, and days of availability, at [chart ~at~ harteventmarketing ~dot~ com](mailto:chart~at~harteventmarketing~dot~com).

For more information about the meeting, see the web site: <http://www.astrosociety.org/events/meeting.html>

Newsletter header image: NGC 5139 - Omega Centauri

Omega Centauri is the biggest of all globular clusters in our galaxy, containing several million stars. It's about 10 times more massive as other globulars, and there are some scientists who theorize that it is the core of a captured galaxy. It's about 15,800 light years away in the constellation Centaurus.

Image taken an ST101XME 1x1 -15C camera and a 5" f/6.3 APO + flattener. R:3x2min (G&B had too much absorption to be of any use). Picture taken at H2O. *Photo: Gert Gottschalk*

Calendar of Events

August 15, 11:00 a.m. - 12:00 p.m.

What: *Astronomy and Evolution: From the Death of the Dinosaurs to the Stardust in your Bones*

Who: David Lindberg and Steve Croft

Where: UC Berkeley, Genetics and Plant Biology Building, Room 100

Cost: Free

Almost 14 billion years ago, the Big Bang created the seeds of the vast structures that we see in the present-day Universe. But how did a sea of scorching hot gas evolve to form the cosmic web of galaxies voids?

The history of life on earth is unequivocally tied to the stars. Material from space has rained down upon our planet for billions of years. Destruction has also come from the skies by the impact of extraterrestrial objects. Life on Earth has been largely determined by events beyond our atmosphere.

Limited hourly pay parking is available on weekends on and nearby campus - please check the signs. For more info about the talks, please visit <http://astro.berkeley.edu/~scroft/iya/>.

August 19, 12:00 - 1:00 p.m.

What: *Mars: The Water Story and Prospects for Life*

Who: Michael Carr (USGS Menlo Park)

Where: SETI in Mountain View

Cost: Free

Recent missions to Mars have provided new evidence that early Mars was at least episodically earth-like with rivers, lakes and possibly oceans, and high rates of aqueous weathering and erosion. Life appears to have arisen early on Earth. Did some form of life start on Mars when conditions on the two planets were similar? Conditions on Mars

subsequently changed to become much less hospitable but life, if started, may have maintained a tenuous foothold.

This lunchtime talk is part of the SETI Institute Colloquium Series. Location is 515 N. Whisman Road, Mountain View, CA 94043. For more info, visit their web site <http://www.seti.org/csc/lectures>, e-mail info@seti.org, or phone 650-961-6633.

August 22, 8:30 p.m.

What: *Prospecting for Water on the Moon*

Who: Dr. Anthony Colaprete (NASA-Ames Research Center)

Where: Mt. Tam

Cost: Free

In 2009, NASA will purposely crash two spacecraft into one of the Moon's polar regions. The impacts should raise huge plumes of material, visible even to smaller telescopes on Earth. Astronomers will search for evidence of water in the plumes to get a better sense of how much frozen water may lay hidden in the deep, shadowed craters of the Moon's North and South poles.

August 22, 7:00 p.m.

What: *Lecture: Cosmology in the 21st Century*
Music of the Spheres Concert

Who: Lecture: Jason X. Prochaska, UCSC
Concert: Coulter/Phillips Trio

Where: Lick Observatory

Cost: \$35 General; \$105 Preferred; \$155 VIP

For information on available tickets visit <http://www.ucolick.org/public/music.html>.

William Coulter and Barry and Shelley Phillips have recorded over 20 albums of traditional and classical music

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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
trivalleystargazers@gmail.com

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 (trivalleystargazers@gmail.com) 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 unless otherwise noted.

August

- 13 Thur **Last Quarter Moon.** 11:55 a.m.
- 14 Fri The Moon occults the Pleiades. 1:00 a.m. to 4:00 a.m.
Jupiter at opposition. 11:00 a.m.
- 17 Mon Io shadow transit on Jupiter. The shadow appears at 1:39 a.m., crosses the meridian at 2:48 a.m.,
and disappears at 3:58 a.m.
Venus and the crescent Moon 4° 39' apart. 5:00 a.m.
- 17 Mon Neptune at opposition. 2:00 p.m.
1877 Asaph Hall discovers Mars' other moon, Phobos.
- 18 Tue Moon at perigee (222,976 miles). 10:00 p.m.
- 20 Thur **New Moon** (lunation 1072). 3:02 a.m.
1977 Voyager 2 launched toward Jupiter and Saturn.
- 21 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,
1893 N. Vasco Road, Livermore.
Ramadan begins at sunset.
1609 Galileo shows off his telescope to the Doge's navy.
- 24 Mon **Tri-Valley Stargazers Board meeting.** 7:30 p.m. at the Round Table Pizza on 1024
E. Stanley Blvd., Livermore.
Mercury at greatest elongation east (27°).
2006 Pluto is officially demoted to dwarf planet status by the IAU.
- 24 Mon Io shadow transit on Jupiter. Starts at 3:34 a.m., crosses the meridian 4:40 a.m., ends 5:53 a.m.
- 25 Tue Io shadow transit on Jupiter. Starts 10:03 p.m., crosses the meridian 11:10 p.m., ends 12:22 a.m.
- 25 Tue 1981 Voyager 2 flies past Saturn.
1989 Voyager 2 flies past Neptune and takes the first close-up pictures of the planet.
- 26 Wed Double shadow transit on Jupiter. Europa's shadow starts 7:22 p.m., transits at 8:43 p.m., ends at
10:14 p.m. Ganymede's shadow starts at 7:43 p.m., transits 9:26 p.m., ends 11:22 p.m.
- 27 Thur **First Quarter Moon.** 4:42 a.m.
The Moon 2° 33' from Antares. 9:00 p.m.
- 29 Sat Mars passes 48' from M35. 5:30 a.m.
1864 William Huggins discovers that nebulae are gas clouds.
- 31 Mon Moon at apogee (251,266 miles). 4:00 a.m.

September

- 1 Tues Io shadow transit on Jupiter. Starts at 11:58 p.m., transits 1:05 a.m., ends 2:15 a.m.
Venus passes 1° 16' from the Beehive Cluster (M44). 5:00 a.m.
1979 Pioneer 11 is first craft to fly past Saturn.
- 2 Wed Double shadow transit on Jupiter. Europa's shadow starts at 9:56 p.m., transits 11:17 p.m., ends
12:46 a.m.; Ganymede's shadow starts 11:41 p.m., transits 1:32 a.m., ends 3:20 a.m.
The Moon is 5° 16' from Jupiter. 9:00 p.m.
- 3 Thur Io shadow transit on Jupiter starts when it's still daylight. Transits meridian at 7:32 p.m., ends 8:44 p.m.
- 4 Fri **Full Moon.** 9:03 a.m.
- 7 Mon **Labor Day.**
- 9 Wed Io shadow transit on Jupiter. Starts 1:53 a.m., transits 2:47 a.m., ends 4:09 a.m.
- 12 Sat 1758 Messier sees the Crab Nebula, making it the first item in his list of fuzzy comet-like objects.
- 14 Mon 1915 John Dobson born in China.

SARSAT to the Rescue

If a plane crashes in the woods and nobody hears it, does it make a sound?

Never mind contemplating this scenario as a philosophical riddle. This can be a real life or death question. And the answer most of the time is that, even if no people are nearby, *something* is indeed listening high above.

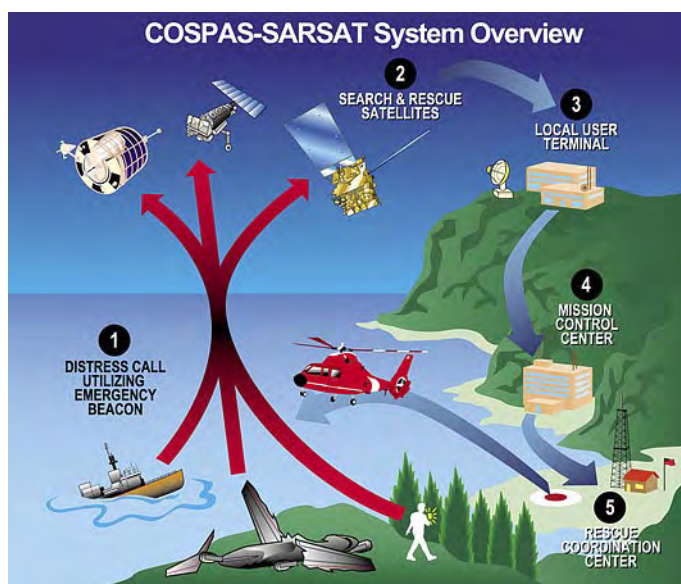
That something is a network of satellites orbiting about 450 miles overhead. The “sound” they hear isn’t the crash itself, but a distress signal from a radio beacon carried by many modern ships, aircraft, and even individual people venturing into remote wildernesses.

In the last 25 years, more than 25,000 lives have been saved using the satellite response system called Search and Rescue Satellite-aided Tracking (SARSAT). So what *are* these life-saving superhero satellites?

Why they are mild-mannered weather satellites.

“These satellites do double duty,” says Mickey Fitzmaurice, a National Oceanic and Atmospheric Administration (NOAA) systems engineer for SARSAT. “Their primary purpose is to gather continuous weather data, of course. But while they’re up there, they might as well be listening for distress signals too.”

In February, NASA launched the newest of these Polar-orbiting Operational Environmental Satellites (or POES) into orbit. This new satellite, called N-Prime at launch and now dubbed NOAA-19, prevents a gap in this satellite network as another, aging NOAA satellite reached the end of its operational life.



NOAA’s polar-orbiting and geostationary satellites, along with Russia’s Cospas spacecraft, are part of the sophisticated, international Search and Rescue Satellite-Aided Tracking System.

“The launch of N-Prime was a big deal for us,” Fitzmaurice says. With N-Prime/NOAA-19 in place, there are now six satellites in this network. Amongst them, they pass over every place on Earth, on average, about once an hour.

To pinpoint the location of an injured explorer, a sinking ship, or a downed plane, POES use the same Doppler effect that causes a car horn to sound higher-pitched when the car is moving toward you than it sounds after it passes by.

In a similar way, POES “hear” a higher frequency when they’re moving toward the source of the distress signal, and a lower frequency when they’ve already passed overhead. It takes only three distress-signal bursts — each about 50 seconds apart — to determine the source’s location.

Complementing the POES are the Geostationary Operational Environmental Satellites (GOES), which, besides providing weather data, continuously monitor the Western Hemisphere for distress signals. Since their geostationary orbit leaves them motionless with respect to Earth below, there is no Doppler effect to pinpoint location. However, they do provide near instantaneous notification of distress signals.

In the future, the network will be expanded by putting receivers on new Global Positioning System (GPS) satellites, Fitzmaurice says. “We want to be able to locate you after just one burst.” With GPS, GOES will also be able to provide the location of the transmitter.

Philosophers beware: SARSAT is making “silent crashes” a thing of the past.

Download a two-page summary of NOAA-19 at www.osd.noaa.gov/POES/NOAA-NP_Fact_Sheet.pdf. The Space Place gives kids a chance to rescue stranded skiers using their emergency rescue beacons. The Wild Weather Adventure game awaits them at spaceplace.nasa.gov/en/kids/goes/wwa.

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

Calendar of Events *continued*

during the past 20 years. Their repertoire spans the world of folk music: from Ireland to Sweden to Bulgaria to China to the American Shakers. Guitarist William Coulter, cellist and percussionist Barry Phillips, Celtic harp and woodwind multi-instrumentalist Shelley Phillips combine the beauty of traditional music and the excitement of modern instrumentation, arrangement, and performance, creating a sound that is both magical and uplifting.

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.
_____ \$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.
_____ \$34 One year subscription to *Astronomy* magazine.
_____ \$60 Two year subscription to *Astronomy* magazine.
_____ \$32.95 One year subscription to *Sky & Telescope* magazine. **Note:** Subscription to *S&T* is for new subscribers only. Existing subscribers please renew directly through *S&T*.
\$ _____ 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.