



SVAS

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OBSERVER

Sacramento Valley Astronomical Society
 Founded in 1945



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Presenting the newly elected SVAS Board Members. From left to right: Chuck Real, Walt Heiges, Kevin Normington, Charles Jones, Kevin Heider, Lonnie Robinson, Dave Macho, and kneeling Raj Dixit. We are all working towards another great year at the SVAS!

SVAS Event Calendar



May 19, Fri, SVAS General Meeting, 8:00pm.

Sacramento City College, Mohr Hall is being renovated, we will temporarily meet in a different room number to be announced soon, 3835 Freeport Boulevard, Sacramento, CA.



May 25, Thursday

New Moon.



May 27, Sat

Blue Canyon



June 16, Fri, SVAS General Meeting, 8:00pm.

Sacramento City College, Room number to be announced!! , 3835 Freeport Boulevard, Sacramento, CA.



June 23, Friday

New Moon.



June 24, Sat

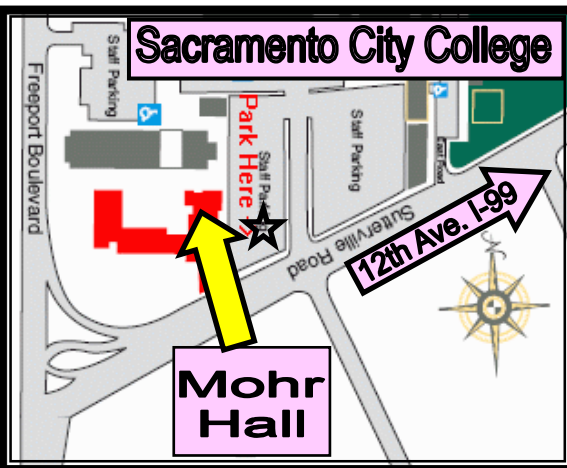
Blue Canyon

Star Party Schedule for 2017

- May 27
- Jun 24
- July 21-23 Star B Q
- Aug 19
- Sept 16 & 23
- Oct 21
- Nov 18
- Dec 16

Star Parties

Blue Canyon



Community Star Parties

Contact Wayne Lord

SVAS Guest Speakers

**Speaker Seeker
Fera Zamani
SVAS Board member**



May 19, 2017, Raj Dixit
will present on;

Hubble vs. Your Scope

Raj will discuss the difference between the beautiful images you see on TV, in books & magazines, and on the internet, compared to what you actually see through a telescope!



June 16, 2017, Ralph Merletti

will present on;

Solar Eclipses



Great Upcoming Star Parties



May 20-25

This is a great dark sky star party hosted by Jack and Beverly Sales. Located near Orland and I-5, makes for a fairly short drive. The entire group area is reserved for astronomers! Please RSVP, limited attendance.

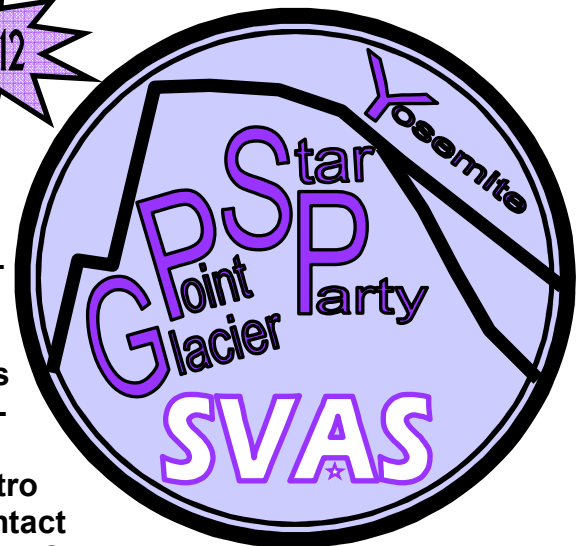
June 21-25. GSSP needs no introduction. The director, Rich Ozer, has done an outstanding job of providing a world class Astro event! The local towns of Aden and Bieber support the group wholeheartedly. Sponsored by TAC (The Astronomy Connection)



Graeagle is one of my personal favorites! Dark skies, free camping in exchange for sharing your views with the locals, and great restaurants! Contact our own Dave Buchla to RSVP, limited attendance.



Yosemite's Glacier Point is a very special SVAS event! Nothing compares to the breathtaking vistas and great Astro viewing! Contact Tom Braun to RSVP, limited attendance.





Solar Eclipse Photography

by Dave Buchla

With the upcoming total solar eclipse August 21st, over the United States mainland, it will be the first time since February 26, 1979. I was asked to share some of my thoughts particularly with regard to photographing the eclipse. So right off the bat, if this is your first eclipse, I would definitely suggest a minimum of photography and a maximum of soaking in this amazing sight. Don't watch the entire eclipse through a viewfinder! I took a couple of photos on my first one, only during the middle of the eclipse, and I am glad I didn't spend the entire time photographing it.

Eclipse sequence

Even before totality, there are interesting natural phenomena to watch for. Here is a short list of things to look for:

1. Make pinhole images and look at shadows. You might want to make a pinhole image (see Figure 1). As totality nears, shadows will be sharper, especially in one direction as opposed to the other (due to the crescent nature of the source). As the partial phase gets further along, you may see things like the hairs on your arm cast a shadow.
2. Notice the color of light in the sky and the temperature dropping. A 10° drop is not uncommon. In the arctic eclipse in March of 2015, the temperature dropped from -10°F to -20°F at totality. Brrrr!
3. About 15 minutes before totality, look west and observe the darker western horizon as the shadow approaches (like an oncoming thunderstorm).
4. A minute or so before totality, you may see shadow bands on a light-colored surface. They are elusive; I've only seen them twice in 14 total eclipses but stuff happens fast and I tend to forget to look. If you see them, yell out "shadow bands" so others can see them.
5. Just before totality, watch for the diamond ring! It is one of the most spectacular events during the eclipse. The diamond ring is fleeting – it only lasts for a couple of seconds but is a true WOW factor. There is a second one marking the end of the eclipse.
6. Right as totality begins, look for the reddish color on the edge of the sun to see the chromosphere. There will probably be a prominence or two. In the 2001 eclipse in Zimbabwe, we saw a detached prominence – something we will never forget. The prominences will seem to change as the eclipse progresses because of the moon's covering some while revealing others.
7. Observe extent of the corona. A small binocular is



ideal to see the structure and gossamer appearance. Some people like to have an eye patch covering one eye before totality, and then remove it during totality to have a dark-adapted eye to view the extent of the corona. I have never done this, but you might want to consider it.

Look around briefly to see the sky color during totality and if any planets or bright stars are visible. It's hard to tear your eyes away from the main event, but worth taking in the whole sky at least once.

Figure 1 Photography

Photography is a wonderful tool to build a memory of the event, but is no replacement for the real thing. Having said that (again), here are some suggestions from my experience. Others may have different ideas, so be open to those ideas too.

One important photograph you can take is to record the general scene during totality with any camera – it can be as simple as a point and shoot and gives you a personal memory. Take a few shots of your surroundings with the eclipsed sun in the background. **NO FLASH!** Use black tape over any possible flash to avoid a huge annoyance, and to avoid having a lot of “former friends”. Having said that, a scene like the one in Figure 2 makes a nice memory. I shot this on shipboard during totality in 2010. Just a quick “click” and back to visual.



Figure 2

If you want to get more serious about photography, I will pass on tips I have used, keeping in mind that there are many eclipse photographers that have done better work than I!

Here are some of my hints:

1. Use only manual focus and settings. You are likely to be frustrated if you let the camera try to focus as it may not be able to do so!
2. Shoot in RAW for later processing and shoot a variety of settings. I like to start with the exposure for the diamond ring (fairly short) and then take longer time exposures.
3. Tripod – avoid extending more than necessary – especially the center column. Add weight to stabilize the tripod.
4. Use a cable release or programmed settings (see Eclipse Orchestrator website).
5. Maximum recommended exposure in seconds = $340/\text{focal length in mm}$. For longer than this, it is best to use a clock drive. For my 440 focal length, a 1 second exposure is about the maximum without a drive.



Figure 3

Incidentally, if you have the luxury of choosing focal length and zoom or not zoom, I prefer a fixed focal length of about 400 -500 mm on my full frame camera (higher will restrict field of view, but it depends to some extent on your camera). My zoom lens, which is the one used in Figure 3, gave me trouble by changing a tiny bit between exposures and made stacking much more difficult as the image size changed a little between photos. The reason I have carted the zoom lens along on eclipse trips is that it is lighter than my big fixed lens, and you know what airlines charge for excess weight!

During totality, there is no time to change ISO, or other settings except for exposure time, so you need to choose settings beforehand. Assuming you are on a tripod, I like to set up for the diamond ring at the start of totality. Figure 4 shows a diamond ring I shot in Tahiti in 2010. This was taken at 1/600 s with an equivalent 420 mm telephoto at ISO 500 using a Canon 5D (on ship-board). An ISO of 400-500 is my preferred value because it is fast enough to pick up outer corona and does not contribute to noticeable noise. Notice the prominences and the chromosphere in this shot. After shooting the short exposures, start lengthening the time exposure to get the outer corona. See the table for details.



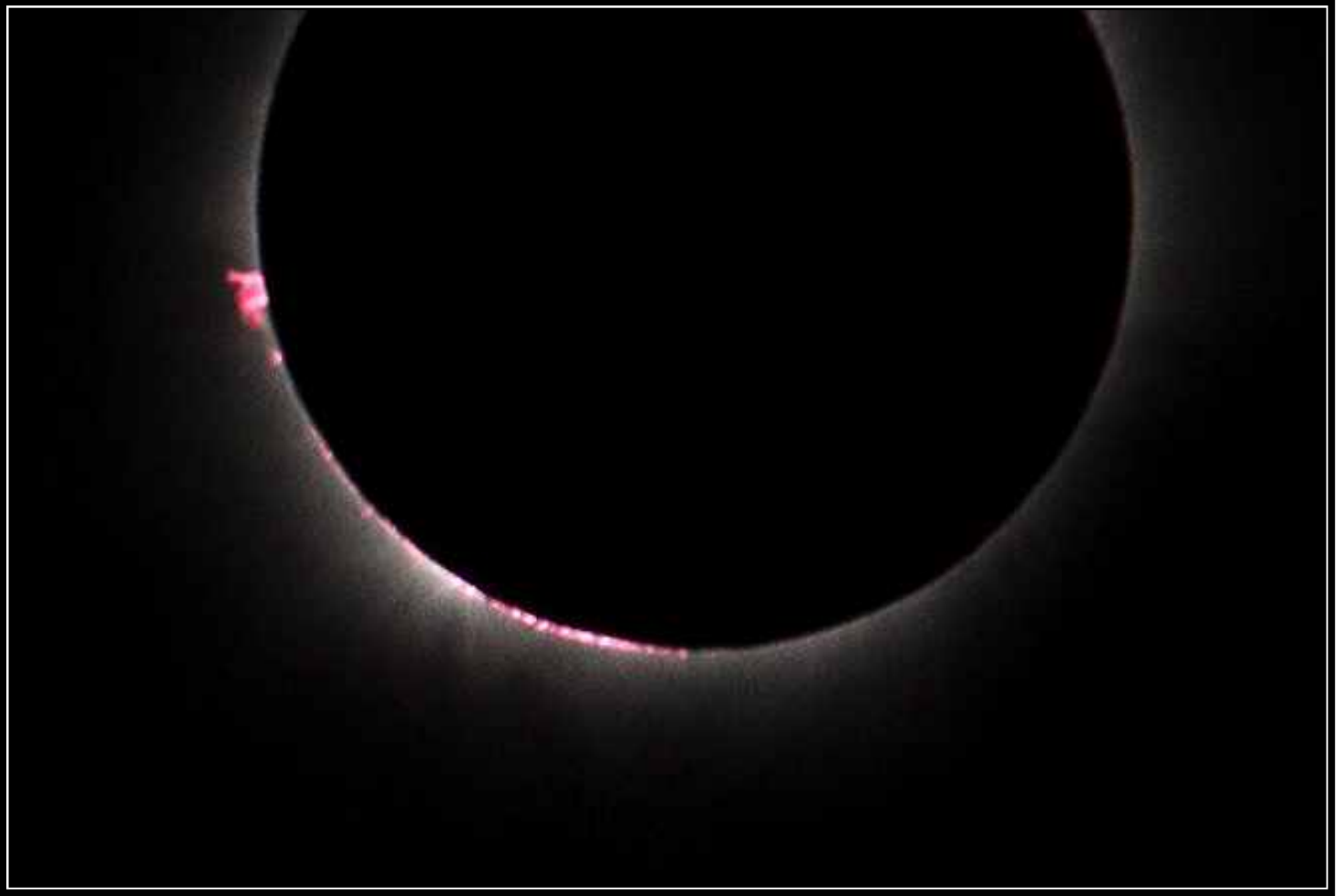
Figure 4

Table 1 will give you an idea of different exposures to use, depending on the f -ratio of your lens. The equation I used to develop the table is from Fred Espanek and is $t = f^2 / (I \times 2^Q)$, where t = shutter speed in seconds, f = f ratio, I = ISO, and Q is a brightness exponent. For a typical ISO setting of 400, exposure times are calculated on the spreadsheet:

Solar phenomena	Q	Shutter Speeds for ISO = 400				
		$f = 2.8$	$f = 4.0$	$f = 5.6$	$f = 8$	$f = 11$
Partial N.D. = 5.0	8		1/6000	1/3000	1/2000	1/1000
Chromosphere	10		1/26000	1/13000	1/6000	1/3000
Prominences	9		1/13000	1/7000	1/3000	1/2000
Innermost Corona	7	1/7000	1/3200	1/1600	1/800	1/400
Diamond Ring	5	1/2000	1/1000	1/400	1/200	1/100
Inner Corona	3	1/400	1/200	1/100	1/50	1/30
Corona at 2 radii	0	1/50	1/25	1/13	1/10	1/3
Corona at 4 radii	-1	1/30	1/13	1/6	1/3	1/2
Outermost Corona	-3	1/6	1/3	1/2	1 sec	2 sec



Bailey's Beads Indonesia, 2016



I hope this gives you some ideas to help with your own eclipse memories. The photo above is a quick shot I took last year in Indonesia of Baileys beads. There is a little blur, I think due to ship motion, but I like the fact that there was a neat string of beads along the lower edge.

Happy shooting!

by Dave Buchla

The Horsehead Nebula



by Mike Bailey

I set up at Sugar Pine Reservoir boat ramp parking lot, at 3,609' elevation. The weather report said lows in the 40's, but conditions got very cold around 11:00 pm forming ice on everything. It felt a lot colder than predicted. The seeing conditions were excellent, and got better as the Moon set. You could see the Milky Way glowing in the darkness, and Jupiter was rising in the east.

I took four pictures, 1200 seconds (20 minutes) each, using Astrodon's 5nm Ha narrow band filter, and a QSI583wsg monochrome camera at -30 degree Celsius. Stellarvue's SV102 APO triplet refractor was used with an IOptron CEM60-EC mount. With a crescent moon still up in a couple of the pictures, the narrowed band filter helped block the Moons' light.

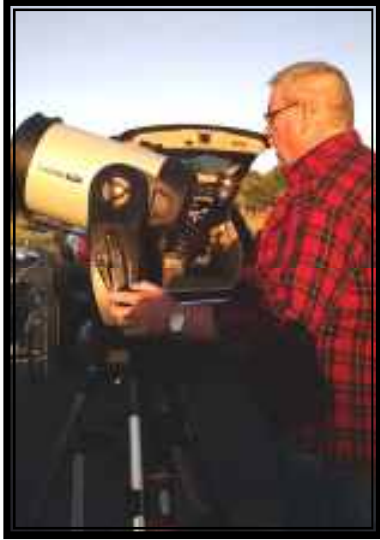


KOHLER PK-8

Home of the Bears

School Star Party Report

by Wayne Lord



We had a good turnout of SVAS volunteers last night, although we missed you. Raj Dixit, Nick Johonie, George Foxworth, Ray Brown and I were there for the first time at this school. The contact person at the school, happens to be a neighbor of my daughter and she mentioned that I was the person to contact for arranging events and gave them my email. They had thought that the school would not be able to afford such an event, but were very happy when they found out there was no charge. Our contact was happy and the kids were excited!



Our school contact did a great job of arranging things, getting the kids organized in groups and sending them out in batches with sufficient adult supervision. They were all well behaved, which made things a lot easier for us volunteers. She also did what almost no other school has been able to do - get the area lights turned off! That made it much better for us, although with the wind all day yesterday the atmosphere was pretty turbulent and dusty so about the only things we could target were the sliver of a moon and Jupiter. We had a wide range of visitors also, from Kindergarten to 7th grade. It was, as always, a joy to hear the exclamations from the kids as they spotted the craters on the moon and the cloud bands on Jupiter.



After the last group of students were done, our host asked us to stay set up for a few minutes longer so that the teachers who had been stuck in classrooms could come out and take a look at what they had been hearing all evening from the kids.

Join us next time!

Wayne Lord/Star_Geezer Citrus Heights, CA



More School Star Party Photos



My thanks to Nick Johonie, Thomas Braun, George Foxworth and Raj Dixit for showing up for last night's school event despite the clouds. I think our hosts and visitors were impressed at the number and sizes of telescopes we brought. Too bad we could only look at a cloudy moon for most of the time.

Wayne Lord, School Star Party Coordinator

SVAS HGO Star Party

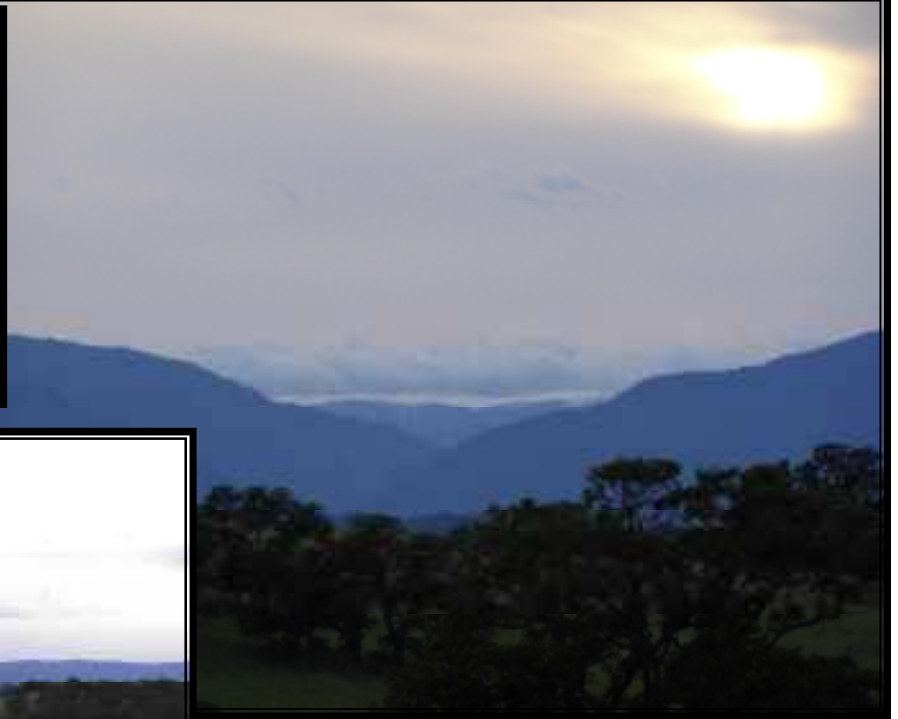
April 29, 2017

Star Party Report



There were no unhappy faces after a long proton starved winter! Leo was at high meridian, and the Virgo cluster gave up quite a show. Later on we found Omega Centauri and Centaurus A in the horizon's haze! I could easily see the curved dust lane in the Centaurus A Galaxy!
FUN STUFF!





Everyone who attends Black Butte for the first time is always impressed by the sheer beauty of the area. I never tire of the amazing vistas, and the plentiful oak trees. This year they were especially beautiful because of the ample moisture, displaying a brighter green contrasted by their dark bark.

This time the Astro gods weren't kind to us, we were mostly clouded out. Only brief clearing at times, but we all know this can and does happen. Even the weather reports can be wrong, imagine that! The photo at left tells the story of serious contemplation about the cloudy skies. The last photo shows plenty of happy faces, it's hard to feel otherwise in such a beautiful place!



Black Butte Lake Star Party



Raj Dixit and Chuck Real setting up at left. Above silhouette photo is Chuck capturing images in the harsh conditions inside his trailer. This can be a demanding hobby!



I only saw Alvin Huey with a happy face. He is a genius at packing up a big telescope in a small car!

The tent at right is on my favorite spot, plenty of shade for sleeping in, and I even had my own bench to enjoy a morning cup of coffee.



Home Sweet Home



The SVAS was well represented, but if you missed out there is another chance May 20-25! Contact Jack & Beverly Sales to RSVP.



Observing and a Campfire with friends. Does it get any better?

First Light with Bill Hagbery



Sharing Ideas & Techniques with Amateur Telescope Makers



The tree above is my official mirror testing target about a hundred yards away, the mirror is not aluminized, using my cell phone camera, breezy conditions, and watching for an occasional bird perching on top. I'm kidding of course, but it's a fun test. I finished up Bill Hagberys' 16" mirror in February, and installed it uncoated it in my scope for evaluation. Notice the PVC sprinkler pipe used for the shorter truss tubes accommodating the f/4.5 ratio, they work really well! The ugly weight tied on the cage was necessary to balance the shorter focus mirror. Clouds rolled in and we waited for small openings to star test, and the good news is it passed!



The very round diffraction image is close to identical in and out of focus, and the secondary shadow broke out about the same distance from focus. Sharp pinpoint star images. The photo above is Jack Sales, Lonnie, and Bill Hagbery.

I finished up Jacks 16" f/4.5 mirror in April. It only took me 45 days from 120 grit, so there is hope for my speedy mirror making. Jack and I tried to star test his mirror at Black Butte, but the clouds got the best of us.

Stay tuned; Jacks mirror tested great on the test stand, I'm confident it will star test great as well.

Lonnie Robinson



Comet Campaign: Amateurs Wanted

by Marcus Woo



In a cosmic coincidence, three comets will soon be approaching Earth—and astronomers want you to help study them. This global campaign, which will begin at the end of January when the first comet is bright enough, will enlist amateur astronomers to help researchers continuously monitor how the comets change over time and, ultimately, learn what these ancient ice chunks reveal about the origins of the solar system.

Over the last few years, spacecraft like NASA's Deep Impact/EPOXI or ESA's Rosetta (of which NASA played a part) discovered that comets are more dynamic than anyone realized. The missions found that dust and gas burst from a comet's nucleus every few days or weeks—fleeting phenomena that would have gone unnoticed if it weren't for the constant and nearby observations. But space missions are expensive, so for three upcoming cometary visits, researchers are instead recruiting the combined efforts of telescopes from around the world.

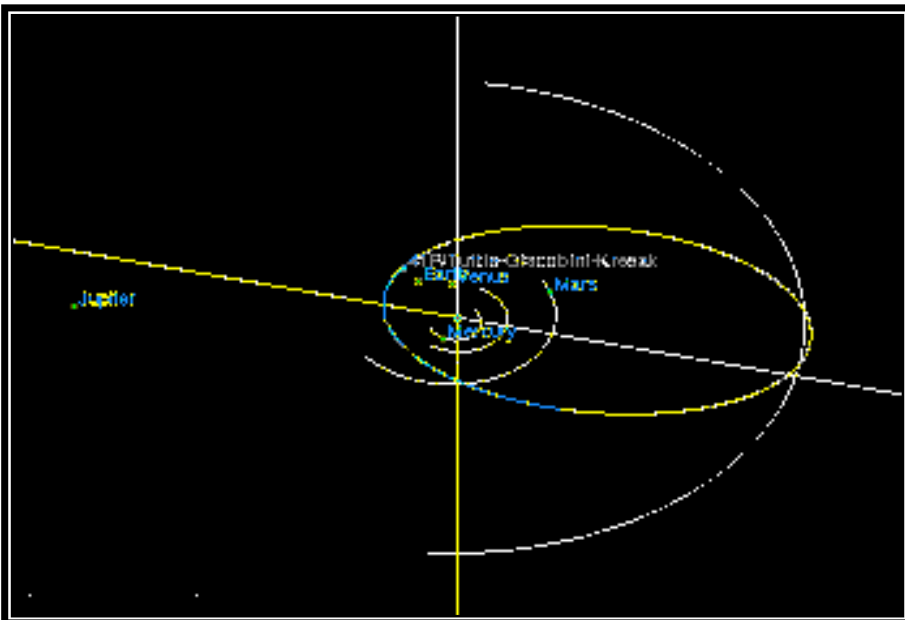
"This is a way that we hope can get the same sorts of observations: by harnessing the power of the masses from various amateurs," says Matthew Knight, an astronomer at the University of Maryland.

By observing the gas and dust in the coma (the comet's atmosphere of gas and dust), and tracking outbursts, amateurs will help professional researchers measure the properties of the comet's nucleus, such as its composition, rotation speed, and how well it holds together.

The observations may also help NASA scout out future destinations. The three targets are so-called Jupiter family comets, with relatively short periods just over five years—and orbits that are accessible to spacecraft. "The better understood a comet is," Knight says, "the better NASA can plan for a mission and figure out what the environment is going to be like, and what specifications the spacecraft will need to ensure that it will be successful."

The first comet to arrive is 41P/Tuttle-Giacobini-Kresak, whose prime window runs from the end of January to the end of July. Comet 45P/Honda-Mrkos-Pajdusakova will be most visible between mid-February and mid-March. The third target, comet 46P/Wirtanen won't arrive until 2018.

Still, the opportunity to observe three relatively bright comets within roughly 18 months is rare. "We're talking 20 or more years since we've had anything remotely resembling this," Knight says. "Telescope technology and our knowledge of comets are just totally different now than the last time any of these were good for observing."



An orbit diagram of comet 41P/Tuttle-Giacobini-Kresak on February 8, 2017—a day that falls during the comet's prime visibility window. The planets orbits are white curves and the comet's orbit is a blue curve. The brighter lines indicate the portion of the orbit that is above the ecliptic plane defined by Earth's orbital plane and the darker portions are below the ecliptic plane. This image was created with the Orbit Viewer applet, provided by the Osamu Ajiki (AstroArts) and modified by Ron Baalke (Solar System Dynamics group, JPL). <http://ssd.jpl.nasa.gov/sbdb.cgi?orb=1;sstr=41P>



Stuart Schulz just sent me this picture, I thought you might enjoy it. Here is his story:

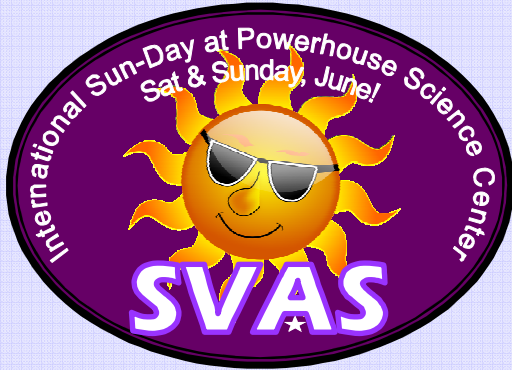
“We had just walked the entire mile or so from freeway to BC collecting trash, mostly from the Snowplay crowd, and I was exhausted--broken sleds, food trash, diapers, beer bottles, paper cups, scattered all over the turnouts. Four large garbage bags of trash collected! Most exhausting of all...we bagged it all up and went to get lunch. Upon our return, half the contents had been ripped apart and scattered again, by...animals? vandals?”

Now I know who helps keep the drive in to BC from the freeway clean and free of garbage. We need to send that bear a ticket for littering!

Thank you Stuart!

Observer Editor

SVAS Main Events



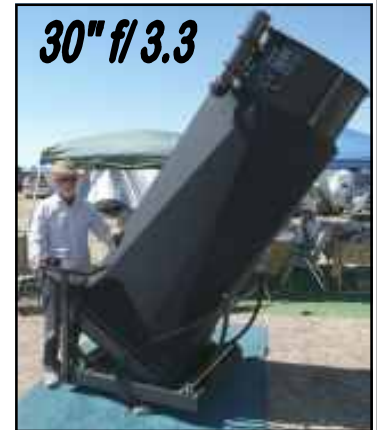
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~ Even Year Term ~

~ Odd Year Term ~

Tom Braun *Fera Zamani* *Chuck Real* *Charles Jones*
Raj Dixit *David Macho*

****Please visit SVAS.Org for contact Information****

Committees

Membership / New Members	Walt Heiges / Kevin Normington
Star-B-Q & Resources	Walt Heiges
Yosemite Star Party	Tom Braun
Newsletter Editors	Lonnie Robinson / Walt Heiges
Speaker Seeker	Fera Zamani
SVAS Web Site	Gary Shuluk / Walt Heiges
Public Outreach Director	Walt Heiges
Community Star Parties	Wayne Lord
Observatory Director	TBA
Help for Beginners	Lonnie Robinson
HGO Maintenance Director	Stuart Schulz
Amateur Telescope Making	Lonnie Robinson / Bill Thomas
Scholarships	Chuck Real / Kevin Normington

Where We Meet

General Meetings the third Friday of each month beginning at 8:00pm.
Board Meetings begin at 6:30 on the same day. All members are welcome.
Star Parties on weekends nearest the new Moon.

Sacramento City College
 Mohr Hall Room 3
 3835 Freeport Boulevard
 Sacramento, CA. 95822
 (12th St. Exit West off I-99)
WWW.SVAS.ORG

SVAS Observer - Newsletter

To Subscribe- First send in your membership application form below, with your dues, and upon approval by the Board of Directors the Observer newsletter (published bi-monthly beginning January) will be sent to your supplied email address in .pdf format. Second, request to join the SVAS Yahoo Group at <http://groups.yahoo.com/group/svas-members>. This group will keep you informed with the day to day current events and discussions.

Articles- Manuscripts and letters are welcome in MS Word, MS Publisher, or plain text format, and emailed to the SVAS Editor. Submission deadline is the 15th of the newsletter release month.

Advertising- Commercial, non-personal advertising, business card, and full page are available. Classified advertising is free to SVAS members.

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SVAS Membership Application

Date ___/___/___ Membership (check one) New: ___ or Renew: ___

Annual Renewal Month is June (Expires July 1st)
(Four months minimum membership is requested, please include the following year if necessary)

General Member <small>(Family-Individual)</small>	<small>Prorate @ \$3 per month</small>	\$36 per yr _____
Observatory Member <small>(Please read Observatory Membership)</small>	<small>Prorate @ \$7 per month</small>	\$84 per yr _____ <small>(General Membership included)</small>
Student Member <small>(ID required)</small>	<small>Prorate @ \$2 per month</small>	\$24 per yr _____

Additional Tax Deductible Contribution \$ _____

Total Enclosed Amount \$ _____

Print Name _____

Address _____

City _____ Zip _____

Phone _____ (E-mail required for newsletter mailing)

E-mail _____

Signature _____

Observatory Membership

Observatory Membership offers the benefits of a regular membership plus unsupervised access to Henry Grieb Observatory (HGO), and Robert J. Mathews Observatory (RJMO), at any time. **To apply, you must have been a general member for six months or longer, be trained and approved by the Observatory Director, send in your application with the additional dues, and then be approved by the SVAS Board of Directors.**



Please allow 30 Days Or More for Application Approval

By signing this application, I acknowledge I have accessed the SVAS website **SVAS.org**, read and understand the SVAS bylaws and the rules governing the USFS Special Use Permit. In doing so, I agree to abide by the respective "terms and conditions" of each as they relate to using the SVAS property and facilities. I further understand and acknowledge that failure to abide by these "terms and conditions" can result in revocation of use privileges and/or SVAS membership.

To: **SVAS Membership Application**
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