Vol.73 No.6* Nov-Dec, 2016

SVAS OBSERVER

Sacramento Valley Astronomical Society

Founded in 1945

Inside This Issue

Photo by Stuart Schulz

SVAS Event Calendar

November 18, Friday, SVAS General Meeting, 8:00pm.

Sacramento City College, Mohr Hall Room 3,
3835 Freeport Boulevard, Sacramento, CA.

November 28

New Moon.

December 3, Sat

Blue Canyon, weather permitting

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

Sacramento City College, Mohr Hall Room 3,
3835 Freeport Boulevard, Sacramento, CA.

December 28

New Moon.

December 31, Saturday

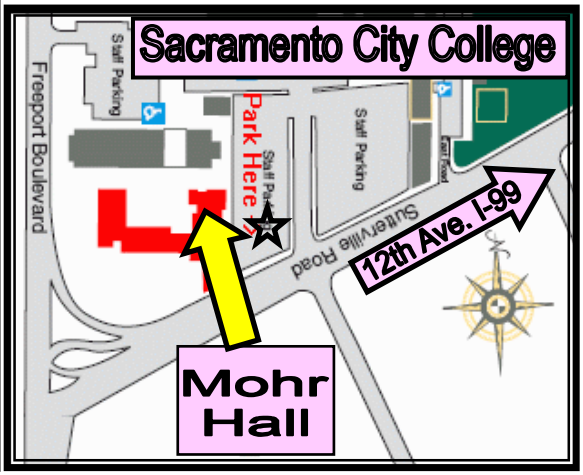
Blue Canyon, weather permitting

Star Party Schedule for 2016

Star Parties

Dec 3
Dec 31

Blue Canyon



Community Star Parties

Contact Wayne Lord

SVAS Guest Speakers

Speaker Seeker
Fera Zamani

November 18, 2016: Bob Fies
Owner of Aluminum Coating

Will present on proper aluminum coating for telescope mirrors, and his experience with laser spotting at Lick Observatory.

John Dobson asked Bob, many years ago, if he could figure out how to coat telescope mirrors. He achieved the goal, and coated countless mirrors for John and the San Francisco Sidewalk Astronomers. Check out his web site; http://www.alcoat.net/ and the SVAS newsletter article dated Jan / Feb, 2016

Dec 16th, 2016: Jon Richards, A Senior Software Engineer at the SETI Institute (Search for Extraterrestrial Intelligence) concentrating on detecting SETI signals using the Allen Telescope Array. He majored in electrical and computer engineering, an expert in computer software development, and he is comfortable developing in many programming languages and many different types of computer systems. His past work has involved a lot of hardware design and development, tying hardware and software to networks and the internet. Since 2008 he has been trying to continually build his skills and knowledge of digital signal processing and trying to master the Allen Telescope Array hardware and software. He plans and implements the observing schedule, develops and maintains the SETI search software. He is also trying to improve the SETI system at the ATA and find new uses for this wonderful instrument.

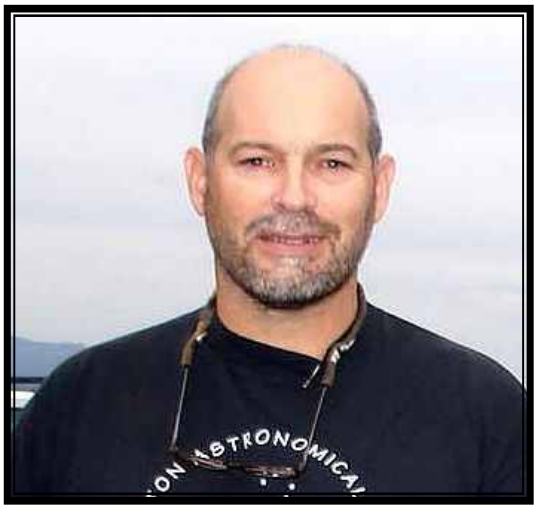
http://www.seti.org/users/jrichards

SETI INSTITUTE

Come join us for a special chance to find out more firsthand about our search for extraterrestrial intelligence.

The SETI Institute is a private, nonprofit organization dedicated to scientific research, education and public outreach. The mission of the SETI Institute is to explore, understand and explain the origin, nature and prevalence of life in the universe.

SVAS Guest Speakers



Jan 20, 2017: Jeff Baldwin, of the Stockton Astronomical Society (SAS), and Dr. Larry Grimes, are scheduled to fly on SOFIA this fall, and have agreed to share their experience with the SVAS next January.

More info coming soon.

http://www.seti.org/seti-educators/nasa-selects-educators-fly-with-astronomers-sofia-airborne-observatory

Feb 17, 2017: Dr. Don Goldman, a deep sky astro-photographer who will talk on the topics of Planetary Nebulae (e.g. Dumbbell, Ring, Helix). What are they? How do they evolve? What do the varied morphologies that we see in images mean? Is there more there than meets the eye? Why are they good imaging targets even with local light pollution? How do we image them? Check out his web site at

http://mstecker.com/pages/appgoldman.htm

MARS

The National Geographic Channel

Executive Producer Ron Howard

We had a great time this year at Rusch Park's Sun- day FunDay! Walt Heiges, Wayne Lord, and myself (Lonnie Robinson) were there with our solar scopes. Perry P. Porter dropped by later for sup- port. Were we short handed and overworked? A bit short handed perhaps, but feel- ing guilty because we were hav- ing all the fun! It was a clear day, but the sun had little going on in the way of sunspots. Towards noon it displayed a beautiful arched flare, which was very exciting for our guests to see. As usual, everyone was more than pleased to have a glimpse of our nearest star, most seeing it up close for the first time. I had constant issues trying to explain the big round circle in the eyepiece was the sun and not the field stop of the eyepiece. The next com- ment usually was; is that really the Sun? We were entertained all afternoon with various activities, great food, and a special visit from the Party Prin- cesses who posed for a photo opp with the SVAS. Till next year...

More Sunday Funday

Theadore Judah Elementary

Oct 11, 2016

School Star Party Report

All the usual school star party volunteers had other things going on, and couldn't attend this one. Nick Johonie and Wayne Lord's guest Jim Carvalho took on the job.

Here is a short note from Nick: "Hay Wayne, Well 2 members, # scopes, 600 kids, it got spooky a few times with onslaughts, but manageable.. I had a lot of fun and I know so did Jim Carvalho."

Thank You Nick and Jim

Jack-O-Lantern Sun

Active regions on the sun combined to look something like a jack-o-lantern's face on Oct. 8, 2014. The image was captured by NASA's Solar Dynamics Observatory, or SDO, which watches the sun at all times from its orbit in space.

The active regions in this image appear brighter because those are areas that emit more light and en- ergy. They are markers of an intense and complex set of magnetic fields hovering in the sun's atmosphere, the co- rona. This image blends together two sets of extreme ultraviolet wavelengths at 171 and 193 Ång- ströms, typically colorized in gold and yellow, to create a particularly Halloween-like appearance.

Credit: NASA/SDO

HGO Repairs

Just a short report about the ongoing repairs at HGO. As you know there have been a rash of break-ins at Blue Canyon, and HGO was breached in August with many items taken. Included was our Android tablet with Sky Safari that runs our telescopes, several eyepieces, and our tool chest. We decided to install a large safe to put all our valuable stuff in, and Perry P. Porter and Charles Jones installed it in the existing equipment closet. The 59" high 10 cubic foot safe is bolted to the floor and wall, hopefully it will be a future deterrent to potential thieves "scoping" out their next target.

The roll-off roof is secure for the coming winter weather with chain tie downs, and we have some new clamps to install at all four corners. I just completed the mounting brackets, and we will get them installed at the next opportunity. Charles Jones and I spent one afternoon last month resealing the roof and roof rails. It was damaged when the roof was blown open last spring. Stuart Schultz reported; Good job, no leaks as of last week! Next up will be repairing the south wall, the siding needs to be replaced soon.

Stuart donated a 7 inch tablet to the SVAS, and Charles Jones donated an Orion Q70 27mm eyepiece. We still have a 19mm Televue Widefield, and we will still need a 55mm and 13mm eyepieces. We also need new hand tools for the observatory.

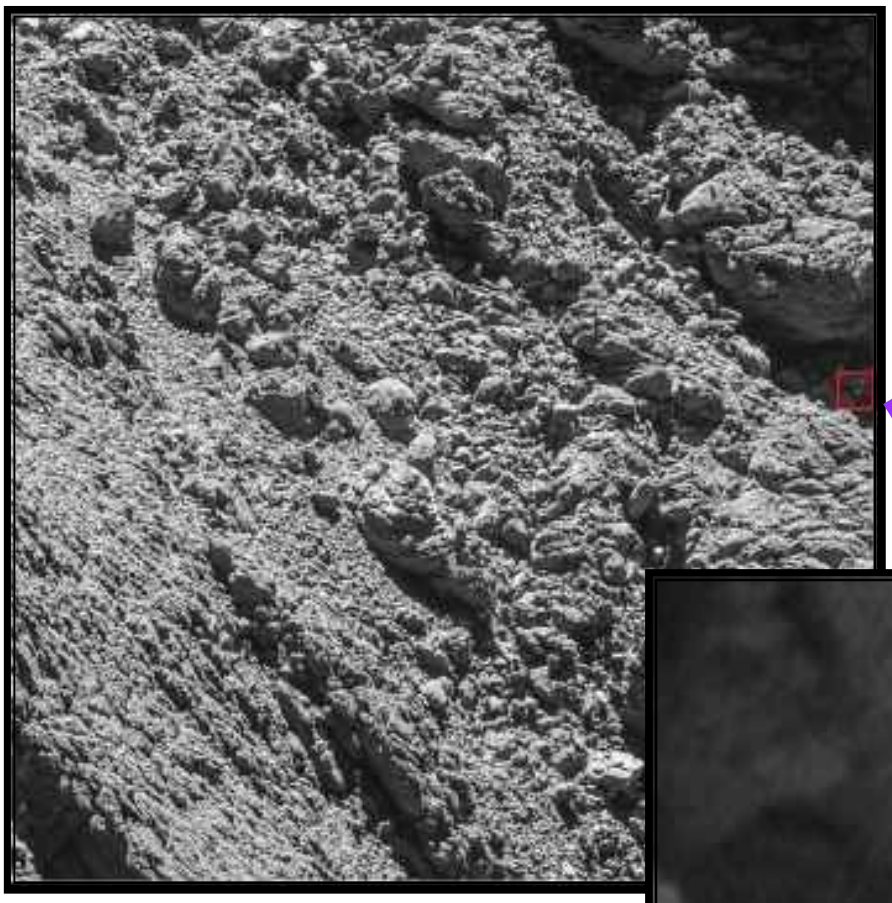
Things are moving along well.

Observer Editor

Photo by Stuart Schulz

Rosetta's Comet Lander Philae Found!

5 September 2016

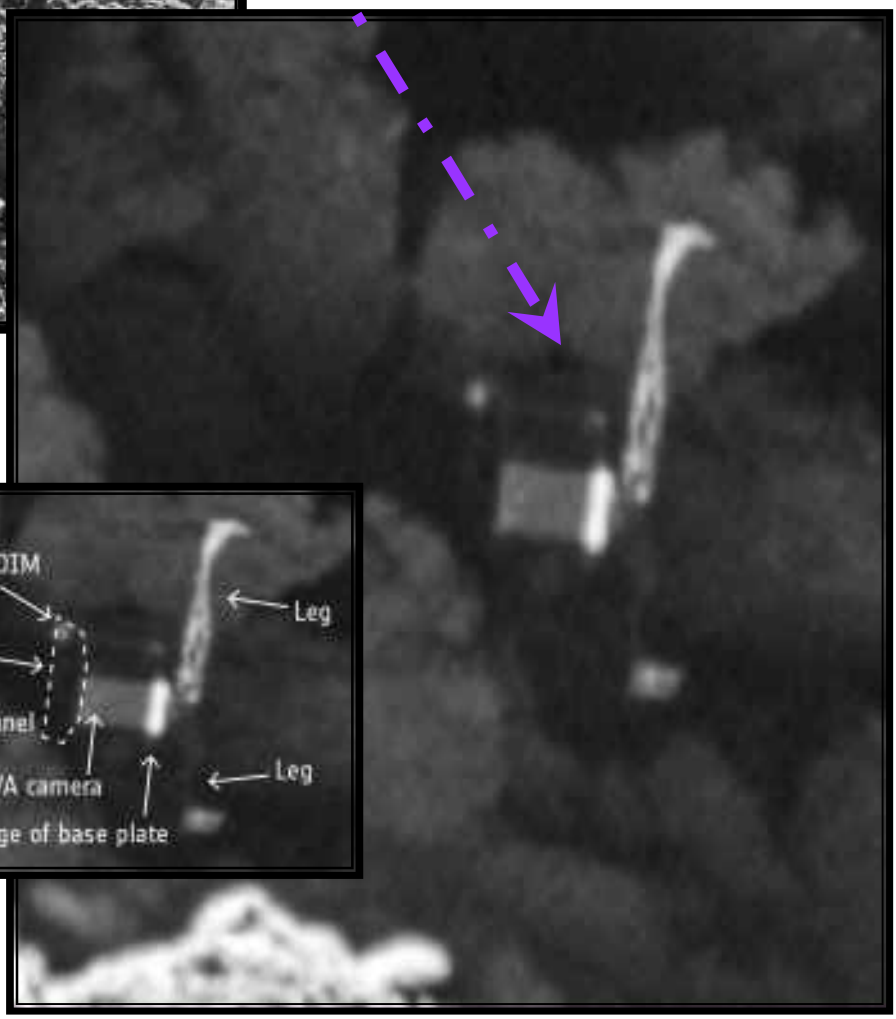


Less than a month before the end of the mission, Rosetta's high-resolution camera has revealed the Philae lander wedged into a dark crack on Comet 67P/Churyumov–Gerasimenko.

The images were taken on 2 September by the OSIRIS narrow-angle camera as the orbiter came within 2.7 km of the surface and clearly show the main body of the lander, along with two of its three legs.

The images also provide proof of Philae's orientation, making it clear why establishing communications was so difficult following its landing on 12 November 2014.

Credit; Europiean Space Agency



The discovery comes less than a month before Rosetta descends to the comet's surface. On 30 September, the orbiter will be sent on a final one-way mission to investigate the comet from close up, including the open pits in the Ma'at region, where it is hoped that critical observations will help to reveal secrets of the body's interior structure.

Mission Complete: Rosetta's Journey Ends In Daring Descent to Comet

ESA's historic Rosetta mission has concluded as planned, with the controlled impact onto the comet it had been investigating for more than two years. Confirmation of the end of the mission arrived at ESA's control centre in Darmstadt, Germany at 11:19 GMT (13:19 CEST) with the loss of Rosetta's signal upon impact.

Rosetta carried out its final maneuver last night at 20:50 GMT (22:50 CEST), setting it on a collision course with the comet from an altitude of about 19 km. Rosetta had targeted a region on the small lobe of Comet 67P/ Churyumov–Gerasimenko, close to a region of active pits in the Ma'at region. The descent gave Rosetta the opportunity to study the comet's gas, dust and plasma environment very close to its surface, as well as take very high-resolution images.

Pits are of particular interest because they play an important role in the comet's activity. They also provide a unique window into its internal building blocks. The information collected on the descent to this fascinating region was returned to Earth before the impact. It is now no longer possible to communicate with the spacecraft.

"Rosetta has entered the history books once again," says Johann-Dietrich Wörner, ESA's Director General. "Today we celebrate the success of a game-changing mission, one that has surpassed all our dreams and expectations, and one that continues ESA's legacy of 'firsts' at comets." "Thanks to a huge international, decades-long endeavour, we have achieved our mission to take a world-class science laboratory to a comet to study its evolution over time, something that no other comet-chasing mission has attempted," notes Alvaro Giménez, ESA's Director of Science.

Some of the most unexpected and important results are linked to the gases streaming from the comet's nucleus, including the discovery of molecular oxygen and nitrogen, and water with a different flavor to that in Earth's oceans.

Together, these results point to the comet being born in a very cold region of the protoplanetary nebula when the Solar System was still forming more than 4.5 billion years ago. While it seems that the impact of comets like Rosetta's may not have delivered as much of Earth's water as previously thought, another much anticipated question was whether they could have brought ingredients regarded as crucial for the origin of life

"It's a bittersweet ending, but in the end the mechanics of the Solar System were simply against us: Rosetta's destiny was set a long time ago. But its superb achievements will now remain for posterity and be used by the next generation of young scientists and engineers around the world." Credit; Europiean Space Agency

ESO Discovers Earth-Sized Planet!

European Southern Observatory

A newly discovered, roughly Earth-sized planet orbiting our nearest neighboring star might be habitable, according to a team of astronomers using the European Southern Observatory's 3.6-meter telescope at La Silla, Chile, along with other telescopes around the world. The exoplanet is at a distance from its star that allows temperatures mild enough for liquid water to pool on its surface.

"NASA congratulates ESO on the discovery of this intriguing planet that has captured the hopes and the imagination of the world," says Paul Hertz, Astrophysics Division Director at NASA Headquarters, Washington. "We look forward to learning more about the planet, whether it holds ingredients that could make it suitable for life." The new planet circles Proxima Centauri, the smallest member of a triple star system known to science fiction fans everywhere as Alpha Centauri. Just over 4 light-years away, Proxima is the closest star to Earth, besides our own sun.

"This is really a game-changer in our field," said Olivier Guyon, a planet-hunting affiliate at NASA's Jet Propulsion Laboratory, Pasadena, California, and associate professor at the University of Arizona, Tucson. "The closest star to us has a possible rocky planet in the habitable zone. That's a huge deal. It also boosts the already existing, mounting body of evidence that such planets are near, and that several of them are probably sitting quite close to us. This is extremely exciting."

The science team that made the discovery, led by Guillem Anglada-Escudé of Queen Mary University of London, will publish its findings Aug. 25 in the journal Nature. The team traced subtle wobbles in the star revealing, the presence of a star-tugging planet. They determined that the new planet, dubbed Proxima b, is at least 1.3 times the mass of Earth. It orbits its star far more closely than Mercury orbits our sun, taking only 11 days to complete a single orbit -- a "year" on Proxima b.

Is Proxima Centauri's Earth-like planet actually like Earth at all?

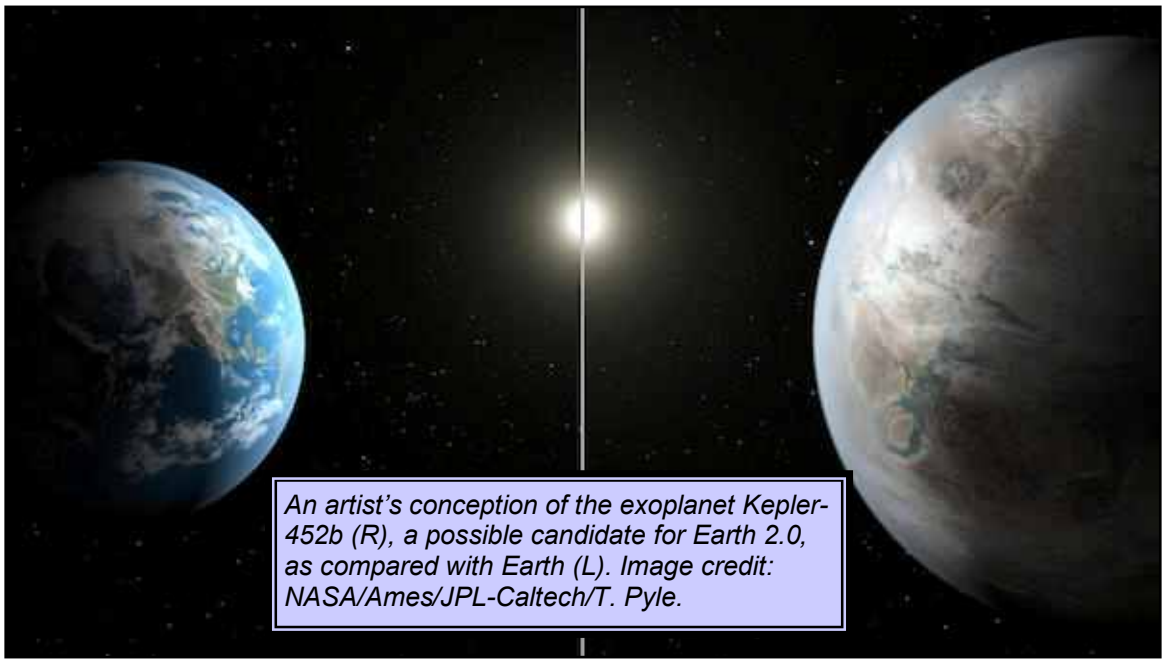
by Ethan Siegel

Just 25 years ago, scientists didn't know if any stars—other than our own sun, of course—had planets orbiting around them. Yet they knew with certainty that gravity from massive planets caused the sun to move around our solar system's center of mass. Therefore, they reasoned that other stars would have periodic changes to their motions if they, too, had planets.

This change in motion first led to the detection of planets around pulsars in 1991, thanks to the change in pulsar timing it caused. Then, finally, in 1995 the first exoplanet around a normal star, 51 Pegasi b, was discovered via the "stellar wobble" of its parent star. Since that time, over 3000 exoplanets have been confirmed, most of which were first discovered by NASA's Kepler mission using the transit method. These transits only work if a solar system is fortuitously aligned to our perspective; nevertheless, we now know that planets—even rocky planets at the right distance for liquid water on their surface—are quite common in the Milky Way.

On August 24, 2016, scientists announced that the stellar wobble of Proxima Centauri, the closest star to our sun, indicated the existence of an exoplanet. At just 4.24 light years away, this planet orbits its red dwarf star in just 11 days, with a lower limit to its mass of just 1.3 Earths. If verified, this would bring the number of Earth-like planets found in their star's habitable zones up to 22, with 'Proxima b' being the closest one. Just based on what we've seen so far, if this planet is real and has 130 percent the mass of Earth, we can already infer the following:

- It receives 70 percent of the sunlight incident on Earth, giving it the right temperature for liquid water on its surface, assuming an Earth-like atmosphere.
- It should have a radius approximately 10 percent larger than our own planet's, assuming it is made of similar elements.
- It is plausible that the planet would be tidally locked to its star, implying a permanent 'light side' and a permanent 'dark side'.
- And if so, then seasons on this world are determined by the orbit's ellipticity, not by axial tilt.



An artist's conception of the exoplanet Kepler-452b (R), a possible candidate for Earth 2.0, as compared with Earth (L). Image credit: NASA/Ames/JPL-Caltech/T. Pyle.

Yet the unknowns are tremendous. Proxima Centauri emits considerably less ultraviolet light than a star like the sun; can life begin without that? Solar flares and winds are much greater around this world; have they stripped away the atmosphere entirely? Is the far side permanently frozen, or do winds allow possible life there? Is the near side baked and barren, leaving only the 'ring' at the edge potentially habitable?

Proxima b is a vastly different world from Earth, and could range anywhere from actually inhabited to completely unsuitable for any form of life. As 30m-class telescopes and the next generation of space observatories come online, we just may find out!

The closest star system to the Earth is the famous Alpha Centauri group. Located in the constellation of Centaurus (The Centaur), at a distance of 4.3 light-years, this system is made up of the binary formed by the stars Alpha Centauri A and Alpha Centauri B, plus the faint red dwarf Alpha Centauri C, also known as Proxima Centauri.

This NASA/ESA Hubble Space Telescope has given us this stunning view of the bright Alpha Centauri A (on the left) and Alpha Centauri B (on the right), shining like huge cosmic headlamps in the dark. The image was captured by the Wide-Field and Planetary Camera 2 (WFPC2). WFPC2 was Hubble's most used instrument for the first 13 years of the space telescope's life, being replaced in 2009 by Wide-Field Camera 3 (WFC3) during Servicing Mission 4. This portrait of Alpha Centauri was produced by observations carried out at optical and near-infrared wavelengths.

Compared to the sun, Alpha Centauri A is of the same stellar type, G2, and slightly bigger, while Alpha Centauri B, a K1-type star, is slightly smaller. They orbit a common center of gravity once every 80 years, with a minimum distance of about 11 times the distance between Earth and the sun. Because these two stars are, together with their sibling Proxima Centauri, the closest to Earth, they are among the best studied by astronomers. And they are also among the prime targets in the hunt for habitable exoplanets.

Using the European Space Organization's HARPS instrument, astronomers already discovered a planet orbiting Alpha Centauri B. Then on Aug. 24, 2016, astronomers announced the intriguing discovery of a nearly Earth-sized planet in the habitable zone orbiting the star Proxima Centauri.

Image credit: ESA/NASA
Text credit: European Space Agency

First Telescope Suggestions

*Large Objective
*Portability
*Budget

by Lonnie Robinson

Meade LightBridge Mini
3.2" f/3.7, $59
4.5" f/3.95, $149
5.1" f/5, $199

Includes 26 & 9mm eye-pieces & red dot

Orion Fun Scope

2.99" f/3.9, $179.99
4.5" f/4.4, 199.99
Inc 10 & 20mm eyepiece
Red Dot finder

Celestron Cometron
2.99" f/3.95, $59.95
4.49" f/3.95, $179.95

Includes 2 eyepieces & finder-scope

Orion XT8 Classic
8" f/5.9
$419.99

Includes one eyepiece & red dot finder

Orion XT10 Classic
10" f/4.7
$629.99

Includes one eyepiece & red dot finder

Meade LightBridge
10" f/5
$699.00

Includes one eyepiece & red dot finder

Choosing That First Scope

A membership letter by Lonnie Robinson

Great news, you are buying a scope! I was in your position back in the 80's when Meade introduced the LX3. It only had tracking, but accepted 12v DC when Celestron only used 110v AC (110v wasn't very portable). I bought an 8" Meade, and I still use it to this day for outreach star parties. The views are very good.

It wasn't long until I wanted a bigger scope, aperture fever it's called, so I started building my 16". I have reached my limit of cost, complexity, and what I can lift. As you get older you can afford and desire bigger aperture, but can't lift as much! A quote form "The Dobsonian Telescope": "My observing friends and I agree that we could live the rest of our lives observing with a 16" without the slightest regret." I'm very satisfied with the views.

At my point in the learning curve, I would rather have a push to Dobsonian that gathers more light than a smaller aperture go to system. I rely on my computer and encoders to find stuff, and push to is something I quickly got used to. I really like the simplicity, and I can quickly move the scope to whatever part of the sky I want. Looking at my 8" tablet screen, with Sky Safari, it shows me everything that is close by. I also enjoy viewing from the top end of the scope, rather than up from the bottom. Another important comparison; Cassegrain's (like the Celestron & Meade) have a larger secondary (~30% or larger obstruction), Dob's are around 19%. The Newtonian Dob's allow more light to the mirror, and the objects have higher contrast and resolution because of less obstruction diffraction in the Airy disk. They also have one less reflecting surface (the diagonal) for less light loss. You won't be disappointed with an Orion, Meade, or Celestron Dob, and nudging them along to track will become second nature in no time.

My suggestion is to get the biggest aperture you can afford and carry. Portability and ease of setup is very important, and the big complicated scope definitely gets less use. 6" is rather small, 8" works, and I was once told 10" is the minimum for viewing most objects and I agree. 10" Dob's are very reasonably priced even with encoders, really easy to set up, and very portable. I think you will find them very easy to sell should the time come. Compare the light gathering; 6" = 28 sq inches, 8" = 50 square, and 10" = 78 squares. My 16" at 200 squares has 4x the area of an 8", and that's a lot of brightness difference in the views. Even if you only use the 6" for planetary, a larger scope will squeeze out a lot more sharpness, detail, and resolution. You will evolve quickly in what you like to view. I have arrived at galaxies as my favorite, and it takes large aperture to see what light is left of these dim subjects.

I was also told years ago, that I will spend as much (or more) for my eyepieces than the telescope. It's true, and I suggest you spend the extra money for some great eyepieces. There's nothing like immersing yourself inside an 80 to 100 degree eyepiece view in any scope! The large field of view makes the Dob experience infinitely better, and the larger view requires fewer tracking adjustments. Remember, as the power increases the field of view decreases, and if you mostly view at very high power tracking may be desirable? The lower the f/ ratio of the scope, the more images tend to be fuzzy towards the outer edges of the eyepiece view. It's called coma, a natural error of the parabolic focus. The more expensive eyepieces are corrected for this error, and scopes below f/4.5 may need an additional coma corrector lens. This is another reason you may want tracking, to keep the object centered in eyepiece's sharpest focus area. The atmosphere rarely supports more than 250-300x in any scope, and most of my viewing is between 100-225x. I suggest buying the best name brand name eyepieces you can, even if you can only afford one every year or two. Stay with one brand for parfocal (the same focus point is convenient when swapping eyepieces back and forth), get the largest field of view you can afford, and they will satisfy for a lifetime. Even if you only buy one great expensive eyepiece a year, soon you will have a complete set (5 is usually adequate for a set). Buy a 2x Barlow to get you by until you can afford that next eyepiece. Good name brand eyepieces are also much easier to sell or trade.

Good luck in your decision! Buy big, aperture fever comes quickly.

Jupiter & Venus Conjunction

I took this photo with my cell phone, and a 16" Dob. A real challenge to get the correct exposure, cell phone cameras want to over expose the images to compensate for the dark background. I used the manual exposure adjustment, to shorten the exposure as much as possible. Next time I will use an adjustable Polarizer filter to reduce the bright planets. The low magnification was necessary to get both Venus and Jupiter in the same eyepiece field of view. Not the greatest images, but fun to use the simple cell phone.

Observer Editor

SVAS Main Events

International Sun-Day at Powerhouse Science Center
Sat & Sunday, June!
SVAS

SVAS
July
Rusch Park
Family Camp Out

Citrus Heights Sunday Funday
SVAS
September
Rusch Park
11:00am - 3:00pm

Star-B-Q
July 21-23, 2017

Star Party Schedule for 2016
Star Parties
Dec 3
Dec 31
Blue Canyon

Yosemite
Star Point Glacier Party
SVAS
July

Community Star Parties
Contact Wayne Lord

Messier Marathon
East SVAS West

SVAS Sponsors!

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by Woodland Hills Camera & Telescopes

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President — Walt Heiges

Vice President — Lonnie Robinson

Secretary — Kevin Heider

Treasurer — Kevin Normington

Past President — Ross Gorman

SVAS Board of Directors

~ Even Year Term ~

Perry Preston Porter

Tom Braun

Fera Zamani

~ Odd Year Term ~

Chuck Real

Charles Jones

David Macho

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	Perry Preston Porter
Help for Beginners	Perry Preston Porter
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 *(Family–Individual)*	*Prorate @ $3 per month*	**$36 per yr** _____
Observatory Member *(Please read Observatory Membership)*	*Prorate @ $7 per month*	**$84 per yr** _____ *(General Membership included)*
Student Member *(ID required)*	*Prorate @ $2 per month*	**$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 the private use of the Henry Grieb Observatory (HGO) at Blue Canyon. **To apply, you must have been a general member for six months or longer, be certified and approved by the Observatory Director, and then 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.

Detach, *SIGN*, & mail with payment.

To: SVAS Membership Application
PO Box 15274
Sacramento, California. 95851-0274