SVAS OBSERVER
Vol.72 No.5* Sept-Oct, 2015
Sacramento Valley Astronomical Society
Founded in 1945

From Pluto with Love

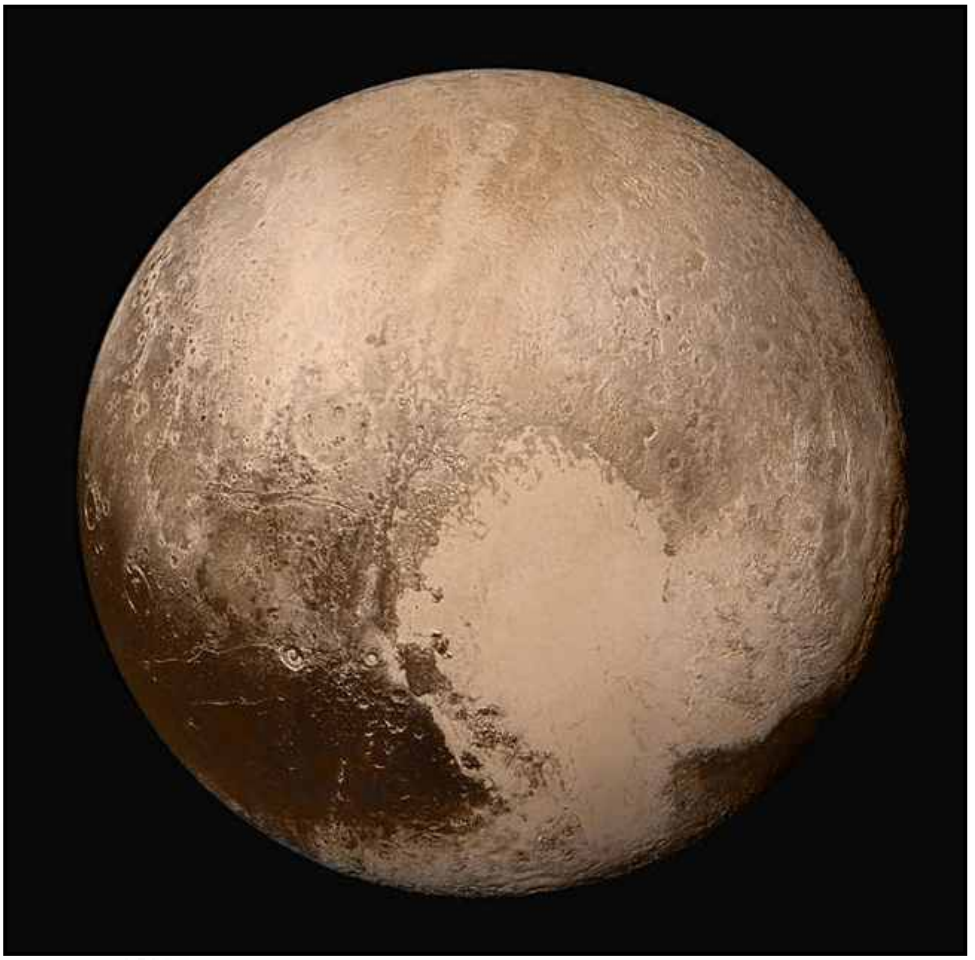


Image Credit: NASA/JHUAPL/SwRI

As a very young boy learning the planets, Pluto was the ninth one orbiting our Sun. It was discovered in 1930 by Clyde Tombaugh, not too long before my time. Growing up with Disney's cartoon character Pluto, gave the new planet a certain connotation of a friendly, happy, place. Definitely close to my heart.

Notice I said planet, how dare they take that designation away! Evidently, there were several other similar sized objects found in the outer solar system, which led the International Astronomical Union to designate Pluto as a minor planet. Still, Pluto lives on, with me, as the ninth planet. It even has the distinction of having the element plutonium named after it, an honor left only to planets.

Pluto resides in the Kuiper Belt, a collection of icy-rocky debris so far out in the solar system that sunlight takes about 5.5 hours to reach it. However, Pluto's orbit is highly elliptical and it occasionally encroaches on Neptune's orbit. Fortunately, they are in resonance which prevents them from ever colliding!

I got really excited as New Horizons approached my favorite planet! The images were breathtaking, and we had traveled so far to snap these first ever seen mosaics! The closer our spacecraft got, the more thrilling and detailed the images were. The hart shaped feature has patiently and endlessly waited to send us it's greeting.

Long Live "Planet" Pluto! Observer Editor

Inside This Issue

SVAS Event Calendar

Sept 12, Sat Blue Canyon, weather permitting.

Dr Richter speaks Sept meeting

Sept 12, Sat New Moon.

Sept 18, General Meeting, Friday at 8:00pm,

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

Scheduled speaker DR. Richter, UC Davis astronomer. Speaking on developing and using a spectrograph on SOFIA, NASA's Boeing 747 airborne observatory.

Sept 27, Sunday FunDay,

11:00am –3:30pm, Sunday FunDay, Rusch Park, Citrus Heights, Contact Walt Heiges

Sept 27, Sunday,
Total Lunar Eclipse
Just After Sunset See page 3

Oct 10, Sat Blue canyon, weather permitting.

Dave Buchla speaks Oct meeting

Oct 12, Monday New Moon.

Oct 16, General Meeting, Friday at 8:00pm

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

Our own Dave Buchla will talk about "Solar Eclipses", don't miss this great presentation!

Star Party Schedule for 2015

Sept 12th
Oct 10th
Nov 14th
Dec 12th

Blue Canyon Star Parties

Messier Marathon

East SVAS West

Contact Tom Braun

Contact Charles Jones

Community Star Parties

Contact Wayne Lord

Total Lunar Eclipse, Sept 27th

Super Moon

Sunday Evening

Lunar Tetrad

Harvest Moon

All at the same time, we get to enjoy the closest Super Moon of 2015, the last tetrad of four total eclipses starting April, 2014, and the Harvest Moon!

The Sept Super Blood Moon will be the closest and last of six in 2015, only 221,754 miles away! The tetrad of four total eclipses is also the last of a series beginning in 2014. The Full Harvest Moon is traditionally when farmers harvested corn, and they could work late into the night assisted by the bright Moonlight. The September 27th Moon rises in the east at 6:50pm, and the eclipse will already be under-way. Great to have an early evening eclipse!

Enjoy!

Pacific Daylight Time, Sunset at 6:52pm
(Sunday evening, September 27, 2015)
Eclipse begins at 5:11pm (below horizon)
Partial eclipse begins: 6:07 p.m. (below horizon)
Full eclipse begins low in the east: 7:11 p.m.
Maximum eclipse: 7:47 p.m.
Full eclipse ends: 8:23 p.m.
Partial eclipse ends: 9:27 p.m.
Eclipse ends at 10:22pm
Duration: 5 hours, 11 minutes

Letter from the Vice President

It's been a fun year being the Newsletter Editor, and doing my best learning to be a good Vice President. My comments must represent the Board as well as the newsletter Editor. The learning curve is steep, working with everyone to help make the SVAS great, and realizing the buck stops here. For the most part it is a fun job working on club activities and helping new members, but this year there has been a downside.

It seems that every so many years, regular as clockwork, someone comes along and tries to "force their will" on our organization with their own ideas of how the club should be run. It's beyond my understanding why anyone would insist on complaining, disrespecting, disrupting, and destroying our club, rather than putting forth the effort to get involved, support and respect the current elected leaders, and work to make things better. Then, if they are still unhappy with the way things are, they should run for office to effect change with the SVAS member's support. The SVAS Board has accomplished very little this year, because we finally had to deal with a similar ongoing serious disruption. I commend the Board for standing unified, enforcing our bylaws, and taking the appropriate action.

That brings me to the issue of member involvement. We need you, the members, to get involved, especially electing your officers and representatives. Each January, you all have the opportunity to nominate a candidate of your choosing, and run a campaign to get them elected at the March election meeting. It's a simple matter of presenting a written petition, signed by three members, to get your candidate on the election slate. Someone who has been a member in good standing for at least six months preceding the election. The last several years, Board positions have been uncontested and filled with people our election committee feels are qualified, willing, reliable, and responsible enough, to take on the jobs. Willing and reliable are tough requirements, there are very few folks willing to take on the clubs responsibilities and stick with the job. The election committee is an excellent way of presenting qualified candidates, but think of them only as one political party's nominations. You, as members can (and should) present your own party choices between Jan 1st and March 1st, when the nominations close. If you only attend one meeting a year, it should be the election meeting!

As your elected representatives, Walt Heiges and I will strive to have your best interests at heart, vote to spend your money wisely and conservatively, and always protect your private information. Call me anytime if only just to say hello.

My door is always open and I will listen to your thoughts, ideas, and concerns,

Lonnie Robinson

SVAS Vice President
SVAS Newsletter Editor
ATM Chairman

SVAS

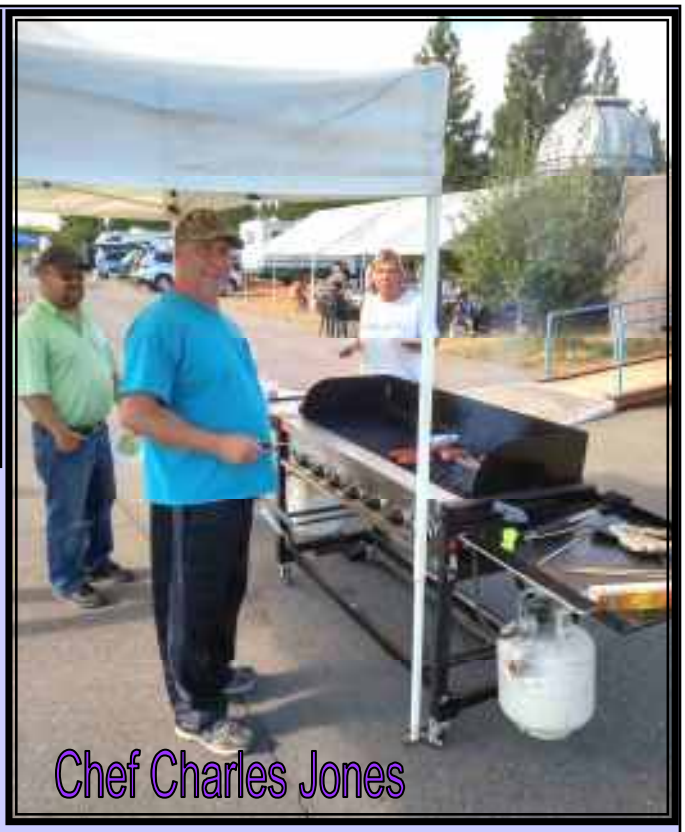
Family Camp Out

Our members were very busy sharing views with the many campers at Rusch Park. Walt & Adam Heiges, Kevin Normington, Perry P. Porter, Wayne Lord, Jack & Beverly Sales, and Lonnie Robinson, were there to provide the views. The skies were very cloudy, only Venus & Jupiter were visible low in the horizon. The views of a crescent Venus were awesome, and Jupiter never disappoints casual observers. The only problem was guests unintentionally walking and standing in front of our low pointing scopes. After Venus and Jupiter set below the horizon, all we had left was Saturn high in the sky making it's home in Libra. The rings are still very open, about a 15 year cycle, and the views were spectacular! I pumped the magnification up to 250x, and our guests were really pleased at the stunning detail. We packed up about 9:30, knowing we had put on a great show!

Star-B-Q 2015 in the History Books

I'm never disappointed with the SVAS Star-B-Q, and this year it was exceptional. We had to deal with the new tarmac parking rules, given to us by Placer County, and everything went very smoothly! I published a new parking map, to scale I might add, and everyone was prepared for the new arrangement. I actually liked it better, because everyone was closer to HGO. The emergency access lane was on the tarmac area towards the runway, allowing closer in positioning of the cars.

The SVAS Board attended in full force, and it was great having their support to organize, setup, and run our event. We even managed to hold a short Board meeting just before the raffle, and were able to vote in the huge number of annual membership renewals. We all helped with the raffle, which made Walt very happy. All too often the workload falls completely on him. There were a large number of raffle tickets sold, and several shirts, sweatshirts, and coffee mugs as well. Thank you all for the tremendous support. Raffle proceeds really help with the ongoing SVAS expenses!



Firing up the Bar-B-Q Grill is always the highlight of the day! We had small problem with the second propane tank providing gas, but somehow I fixed it. I take all the credit, but I really don't know what I did to fix it? Charles Jones did a fantastic job of grill master, and he really enjoyed interacting with the members. The food came off the grill perfectly cooked all afternoon, well at least until I put my steak on. Then, somehow I left it too long on the first side, burning it a bit (I can't blame Charles for it even though I would like to, kidding). I must say even the burned side was delicious, and next time it might be on purpose!

The photos below are the SVAS Board members at work. We really did work, even though a couple photos show us sitting around. Sitting was only temporary. This year we all got together on Friday, and assembled the canopies. It proved so much easier having them ready to go for the big event, and we could direct our attention to other things. Many were still there Sunday morning, and takedown was a breeze. A special thank you to everyone who helped!

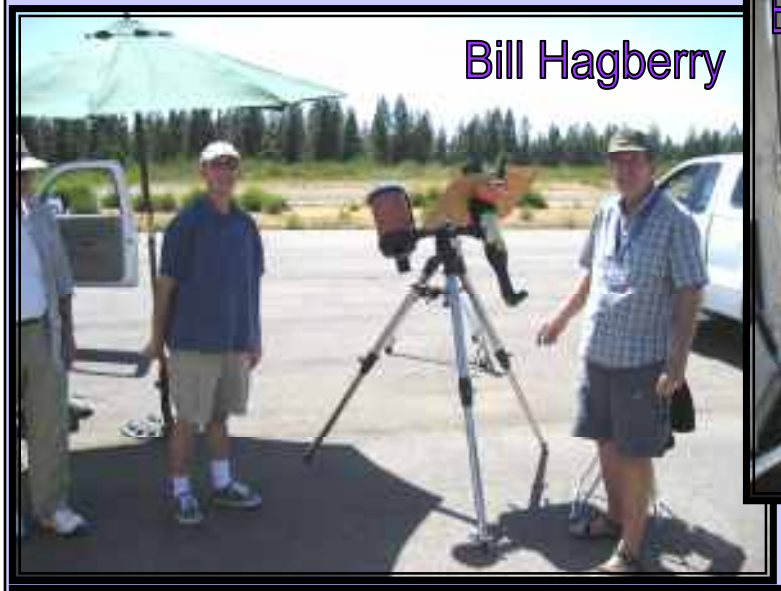
Thomas & Brian, Charles Jones's twin sons, expressed a desire to own their first telescope, and to their delight they got the first choice of all the raffle telescopes. What a thrill to see these bright young boys expanding their horizons in astronomy! The rest of the telescopes went fast, but there were a lot of great prizes left to choose from.

After the raffle, we all got ready for a evening under the stars. It looked like the weather was going to cooperate, and cooperate it did.

We are always happy to see some great telescopes at Star-B-Q. Bill Thomas brought his recently completed 14" Dobsonian. I really like his scope designs, and his mirror making skills are second to none. Dave Buchla had his 14" Celestron and giant binoculars. Have you ever viewed Andromeda in his Binoculars? They provide a gigantic field of view, and a crisp image of the huge galaxy. Bruce Sayer brought his beautiful 14" binocular telescope to share. Such views are only obtained with two eyes! He borrowed two Ethos eyepieces for a trial run, impressive to say the least, providing a 100 degree field for each eye! John Goechl set up his handcrafted English Yoke mounted telescope. Check out his drive mechanism next time you see it. Matt Jennings brought his 22" Dob, and donated telescopes for the raffle. Thank you Mat! There were many other great member scopes, sorry if I missed yours. I need to start a member sign in sheet, to accompany the photos, so I don't miss anyone. I didn't bring my 16" Dob this year, I was the acting Observatory Director in Perry's absence. It was really a treat to operate the Ritchie for all our guests.

We need to name Walt Heiges and Bill Hagbery, our official SVAS solar observers. Bill is always well equipped for the hot daytime viewing, with his portable canopy, sun screen mounted on his scope, and he usually has a hand held water misting fan. The views in his H-Alpha scope are amazing, and he has a white filter as well.

Bruce, Jean, Dave, Bill, and Fran definitely know how to enjoy star parties, and they invited me over for some ice cream and berries! I thought it over carefully for about 1/1000 of a second before saying yes! We are privileged to have such friendly, knowledgeable, and talented people, in our membership!


Bill Hagberry

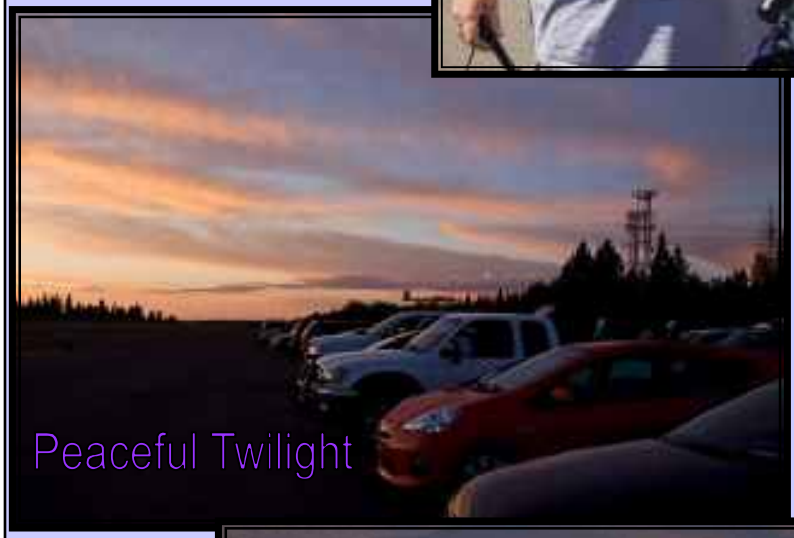

Bruce & Jean Sayer, Dave Buchla, Bill & Fran Thomas


Dave Buchla & Bruce Sayer's Scopes


Wayne Lord

Wayne Lord was on a mission to attach the clubs Mallincam to the 12” Mead in HGO. That darn Mead keeps everyone frustrated on setting up the hand pad. I know it will be a total surprise, but it fools me too (kidding again). I spent some quality time with the Meade last week, and I think we are better friends now. Wayne attempted to set up the Mallincam monitor in the warm up room for our members enjoyment.

Don Edelberg employed a great strategy, tilting his canopy to provide more afternoon shade!



An HGO sunset is the perfect way to end a perfect day, and begin an evening under the stars! Start planning early next year, to attend this extra special SVAS event.

You will go home with memories to last a lifetime.
Observer Editor

Special thanks to Wayne Lord for several of the Star-B-Q photos!

NASA's New Horizons Team Finds Haze, Flowing Ice on Pluto

Backlit by the sun, Pluto's atmosphere rings its silhouette like a luminous halo in this image taken by NASA's New Horizons spacecraft around midnight EDT on July 15. This global portrait of the atmosphere was captured when the spacecraft was about 1.25 million miles (2 million kilometers) from Pluto and shows structures as small as 12 miles across. The image, delivered to Earth on July 23, is displayed with north at the top of the frame.

Credits: NASA/JHUAPL/SwRI

Flowing ice and a surprising extended haze are among the newest discoveries from NASA's New Horizons mission, which reveal distant Pluto to be an icy world of wonders.

"We knew that a mission to Pluto would bring some surprises, and now -- 10 days after closest approach -- we can say that our expectation has been more than surpassed," said John Grunsfeld, NASA's associate administrator for the Science Mission Directorate. "With flowing ices, exotic surface chemistry, mountain ranges, and vast haze, Pluto is showing a diversity of planetary geology that is truly thrilling."

Just seven hours after closest approach, New Horizons aimed its Long Range Reconnaissance Imager (LORRI) back at Pluto, capturing sunlight streaming through the atmosphere and revealing hazes as high as 80 miles (130 kilometers) above Pluto's surface. A preliminary analysis of the image shows two distinct layers of haze -- one about 50 miles (80 kilometers) above the surface and the other at an altitude of about 30 miles (50 kilometers).

"My jaw was on the ground when I saw this first image of an alien atmosphere in the Kuiper Belt," said Alan Stern, principal investigator for New Horizons at the Southwest Research Institute (SwRI) in Boulder, Colorado. "It reminds us that exploration brings us more than just incredible discoveries -- it brings incredible beauty."

Portrait of Pluto & Charon

The latest two full-frame images of Pluto and Charon were collected separately by New Horizons during approach on July 13 and July 14, 2015. The relative reflectivity, size, separation, and orientations of Pluto and Charon are approximated in this composite image, and they are shown in approximate true color.

Image Credit: NASA/JHUAPL/SWRI

Lost-in-Space Galaxy

I had a chance to view this galaxy last week at Graeagle. It's a good size at 18mly distant. Impressive and beautiful in scopes 8" and larger!
Lonnie

Most galaxies are clumped together in groups or clusters. A neighboring galaxy is never far away. But this galaxy, known as NGC 6503, has found itself in a lonely position, at the edge of a strangely empty patch of space called the Local Void.

The Local Void is a huge stretch of space that is at least 150 million light-years across. It seems completely empty of stars or galaxies. The galaxy's odd location on the edge of this never-land led stargazer Stephen James O'Meara to dub it the "Lost-In-Space galaxy" in his 2007 book, Hidden Treasures.

NGC 6503 is 18 million light-years away from us in the northern circumpolar constellation of Draco. NGC 6503 spans some 30,000 light-years, about a third of the size of the Milky Way.

This Hubble Space Telescope image shows NGC 6503 in striking detail and with a rich set of colors. Bright red patches of gas can be seen scattered through its swirling spiral arms, mixed with bright blue regions that contain newly forming stars. Dark brown dust lanes snake across the galaxy's bright arms and center, giving it a mottled appearance.

The Hubble Advanced Camera for Surveys data for NGC 6503 were taken in April 2003, and the Wide Field Camera 3 data were taken in August 2013.

The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency. NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, Inc., in Washington, D.C.

Photo Credit: NASA, ESA, D. Calzetti (University of Massachusetts), H. Ford (Johns Hopkins University), and the Hubble Heritage Team

On the Brightness of Venus

by Ethan Siegel

Throughout the past few months, Venus and Jupiter have been consistently the brightest two objects visible in the night sky (besides the moon) appearing in the west shortly after sunset. Jupiter is the largest and most massive planet in the solar system, yet Venus is the planet that comes closest to our world. On June 30th, Venus and Jupiter made their closest approach to one another as seen from Earth—a conjunction—coming within just 0.4° of one another, making this the closest conjunction of these two worlds in over 2,000 years.

And yet throughout all this time, and especially notable near its closest approach, Venus far outshines Jupiter by 2.7 astronomical magnitudes, or a factor of 12 in apparent brightness. You might initially think that Venus's proximity to Earth would explain this, as a cursory check would seem to show. On June 30th Venus was 0.5 astronomical units (AU) away from Earth, while Jupiter was six AU away. This appears to be exactly the factor of 12 that you need.

Only this doesn't explain things at all! Brightness falls off as the inverse square of the distance, meaning that if all things were equal, Venus ought to seem not 12 but 144 times brighter than Jupiter. There are three factors in play that set things back on the right path: size, albedo, and illumination. Jupiter is 11.6 times the diameter of Venus, meaning that despite the great difference in distance, the two worlds spanned almost exactly the same angular diameter in the sky on the date of the conjunction. Moreover, while Venus is covered in thick, sulfuric acid clouds, Jupiter is a reflective, cloudy world, too. All told, Venus possesses only a somewhat greater visual geometric **albedo** (or amount of reflected visible light) than Jupiter: 67 percent and 52 percent, respectively. Finally, while Venus and Jupiter both reflect sunlight toward Earth, Jupiter is always in the full (or almost full) phase, while Venus (on June 30th) appeared as a thick crescent.

All told, it's a combination of these four factors—distance, size, albedo, and the phase-determined illuminated area—that determine how bright a planet appears to us, and all four need to be taken into account to explain our observations.

Don't fret if you missed the Venus-Jupiter conjunction; three more big, bright, close ones are coming up later this year in the eastern pre-dawn sky: Mars-Jupiter on October 17, Venus-Jupiter on October 26, and Venus-Mars on November 3.

Keep watching the skies, and enjoy the spectacular dance of the planets!

Hubble's High-Definition Panoramic View of the Andromeda Galaxy

This sweeping bird's-eye view of a portion of the Andromeda galaxy (M31) is the sharpest image ever taken of our galactic next-door neighbor.

The largest NASA Hubble Space Telescope image ever assembled, this sweeping bird's-eye view of a portion of the Andromeda galaxy (M31) is the sharpest large composite image ever taken of our galactic next-door neighbor. Though the galaxy is over 2 million light-years away, the Hubble Space Telescope is powerful enough to resolve individual stars in a 61,000-light-year-long stretch of the galaxy's pancake-shaped disk. It's like photographing a beach and resolving individual grains of sand. And there are lots of stars in this sweeping view -- over 100 million, with some of them in thousands of star clusters seen embedded in the disk. This ambitious photographic cartography of the Andromeda galaxy represents a new benchmark for precision studies of large spiral galaxies that dominate the universe's population of over 100 billion galaxies. Never before have astronomers been able to see individual stars inside an external spiral galaxy over such a large contiguous area. Most of the stars in the universe live inside such majestic star cities, and this is the first data that reveal populations of stars in context to their home galaxy. The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency. NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, Inc., in Washington.

Hubble's High-Definition Panoramic View of the Andromeda Galaxy Image Credit: NASA, ESA, J. Dalcanton, B.F. Williams, and L.C. Johnson (U. of Washington), the Panchromatic Hubble Andromeda Treasury (PHAT) team, and R. Gendler

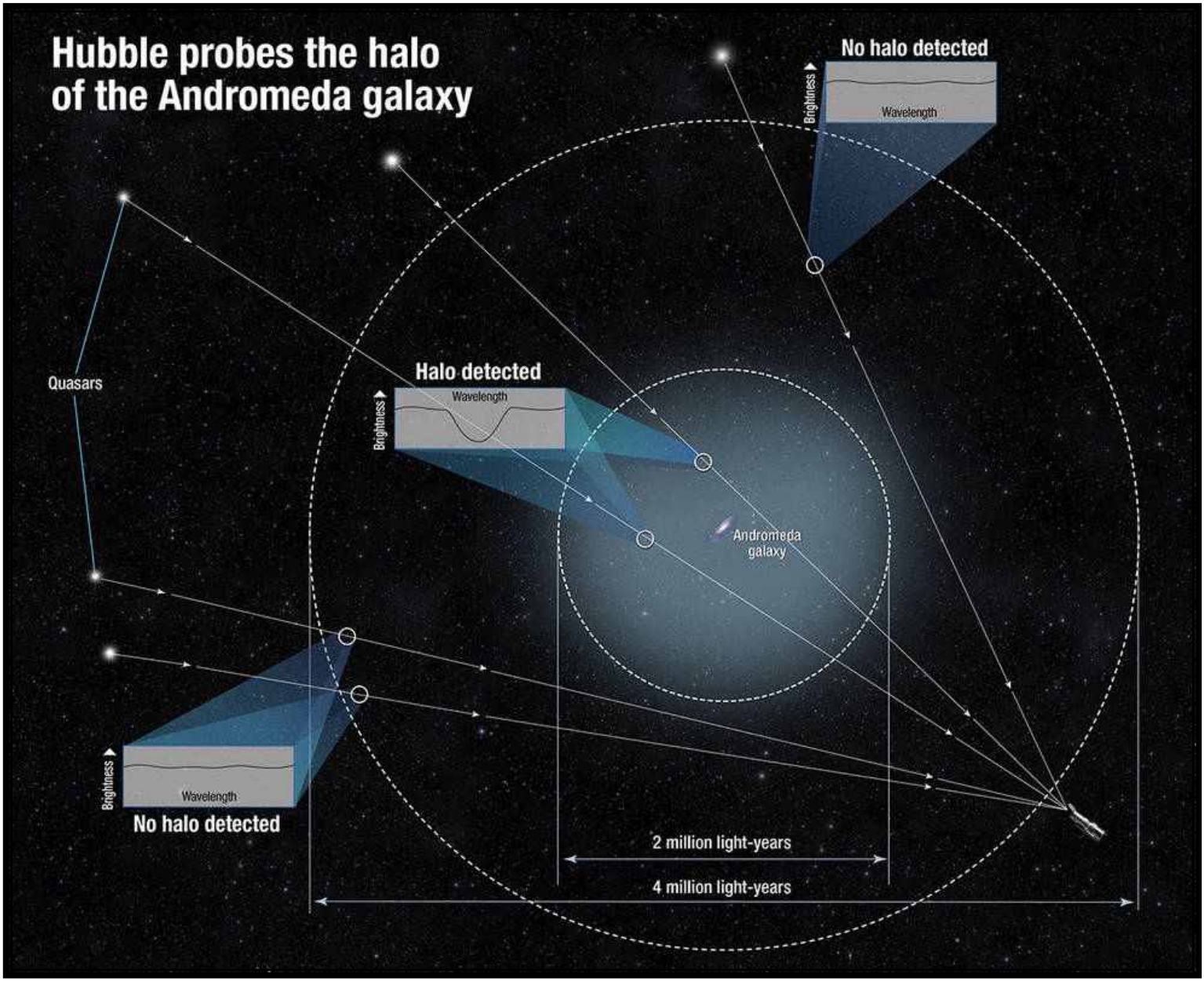
Giant Halo Discovered Around Andromeda

Scientists using NASA's Hubble Space Telescope have discovered that the immense halo of gas enveloping the Andromeda galaxy, our nearest massive galactic neighbor, is about six times larger and 1,000 times more massive than previously measured. The dark, nearly invisible halo stretches about a million light-years from its host galaxy, halfway to our own Milky Way galaxy. This finding promises to tell astronomers more about the evolution and structure of majestic giant spirals, one of the most common types of galaxies in the universe.

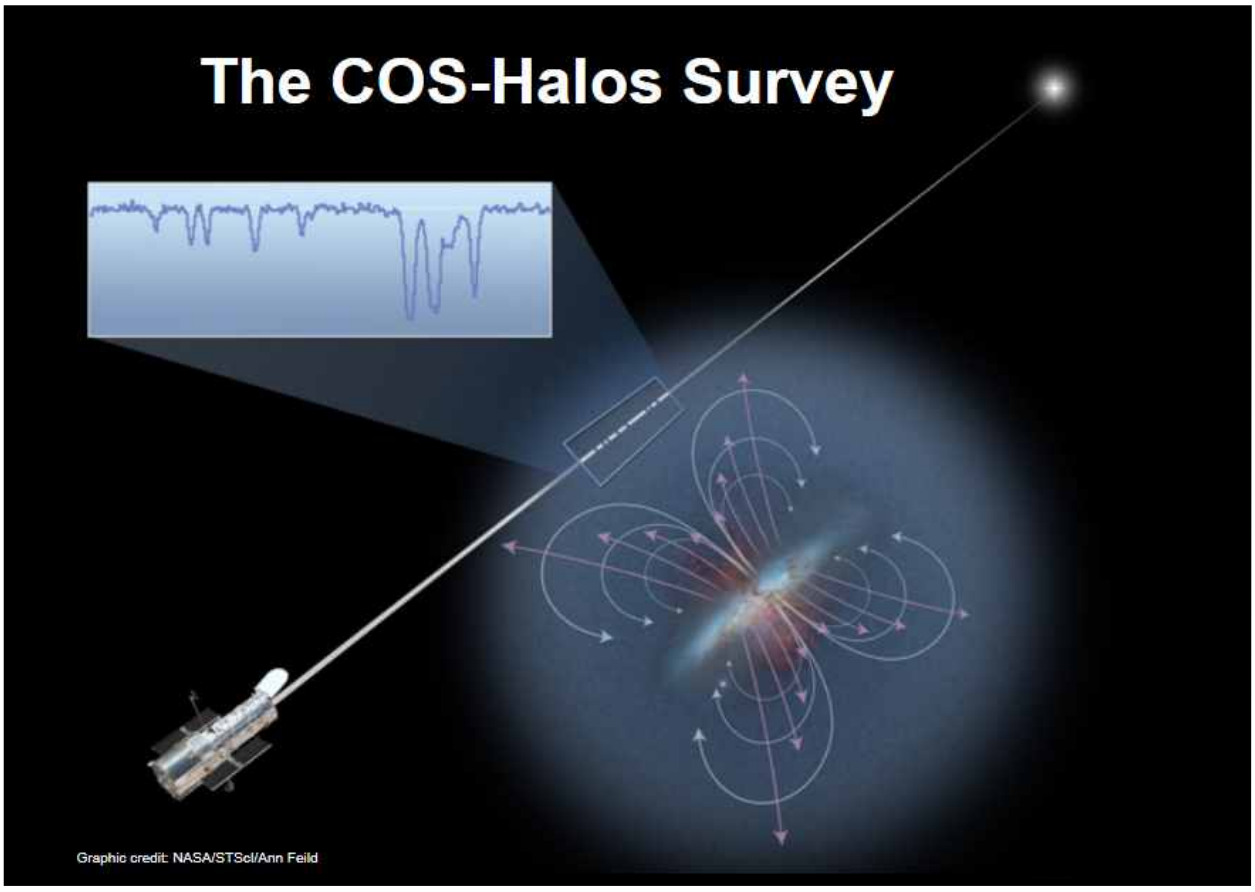
"Halos are the gaseous atmospheres of galaxies. The properties of these gaseous halos control the rate at which stars form in galaxies according to models of galaxy formation," explained the lead investigator Nicolas Lehner of the University of Notre Dame, Indiana. The gargantuan halo is estimated to contain half the mass of the stars in the Andromeda galaxy itself, in the form of a hot, diffuse gas. If it could be viewed with the naked eye, the halo would be 100 times the diameter of the full moon in the sky. This is equivalent to the patch of sky covered by two basketballs held at arm's length.

The Andromeda galaxy lies 2.5 million light-years away and looks like a faint spindle, about 6 times the diameter of the full moon. It is considered a near-twin to the Milky Way galaxy.

Because the gas in Andromeda's halo is dark, the team looked at bright background objects through the gas and ob-



served how the light changed. This is a bit like looking at a glowing light at the bottom of a pool at night. The ideal background "lights" for such a study are quasars, which are very distant bright cores of active galaxies powered by black holes. The team used 18 quasars residing far behind Andromeda to probe how material is distributed well beyond the visible disk of the galaxy. Their findings were published in the May 4, 2015 edition of the Astrophysical Journal.



Earlier research from Hubble Cosmic Origins Spectrograph (COS)-Halos program studied 44 distant galaxies and found halos like Andromeda's, but never before has such a massive halo been seen in a neighboring galaxy. Because the previously studied galaxies were much farther away, they appeared much smaller on the sky. Only one quasar could be detected behind each faraway galaxy, providing only one light anchor point to map their halo size and structure. With its close proximity to Earth and its correspondingly large footprint on the sky, Andromeda provides a far more extensive sampling of a lot of background quasars.

"As the light from the quasars travels toward Hubble, the halo's gas will absorb some of that light and make the quasar appear a little darker in just a very small wavelength range," explains co-investigator J. Christopher Howk, also of Notre Dame. "By measuring the dip in brightness in that range, we can tell how much gas there is between us and that quasar."

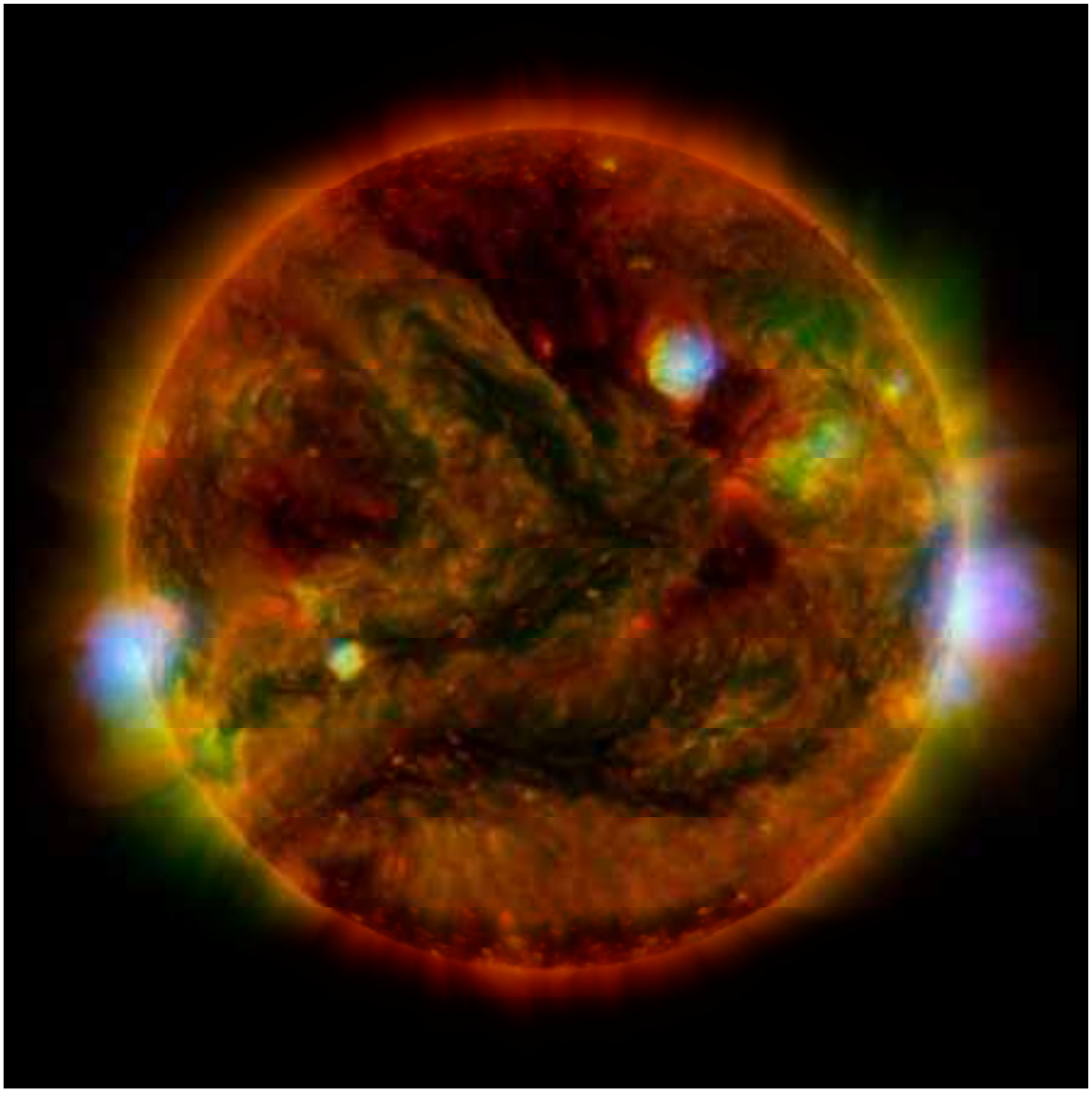
The scientists used Hubble's unique capability to study the ultraviolet light from the quasars. Ultraviolet light is absorbed by Earth's atmosphere, which makes it difficult to observe with a ground-based telescope. The team drew from about 5 years worth of observations stored in the Hubble data archive to conduct this research. Many previous Hubble campaigns have used quasars to study gas much farther away than -- but in the general direction of -- Andromeda, so a treasure trove of data already existed.

But where did the giant halo come from? Large-scale simulations of galaxies suggest that the halo formed at the same time as the rest of Andromeda. The team also determined that it is enriched in elements much heavier than hydrogen and helium, and the only way to get these heavy elements is from exploding stars called supernovae. The supernovae erupt in Andromeda's star-filled disk and violently blow these heavier elements far out into space. Over Andromeda's lifetime, nearly half of all the heavy elements made by its stars have been expelled far beyond the galaxy's 200,000 light-year diameter stellar disk.

What does this mean for our own galaxy? Because we live inside the Milky Way, scientists cannot determine whether or not such an equally massive and extended halo exists around our galaxy. It's a case of not being able to see the forest for the trees. If the Milky Way does possess a similarly huge halo, the two galaxies' halos may be nearly touching already and quiescently merging long before the two massive galaxies collide. Hubble observations indicate that the Andromeda and Milky Way galaxies will merge to form a giant elliptical galaxy beginning about 4 billion years from now.

The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency. NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, Inc., in Washington. ***Credits: NASA/STScI , Rob Gutro NASA'S Goddard Space and Flight Center***

NuSTAR Stares at the Sun



Flaring, active regions of our sun are highlighted in this new image combining observations from several telescopes. High-energy X-rays from NASA's Nuclear Spectroscopic Telescope Array (NuSTAR) are shown in blue; low-energy X-rays from Japan's Hinode spacecraft are green; and extreme ultraviolet light from NASA's Solar Dynamics Observatory (SDO) is yellow and red.

All three telescopes captured their solar images around the same time on April 29, 2015. The NuSTAR image is a mosaic made from combining smaller images.

The active regions across the sun's surface contain material heated to several millions of degrees. The blue-white areas showing the NuSTAR data pinpoint the most energetic spots. During the observations, microflares went off, which are smaller versions of the larger flares that also erupt from the sun's surface. The microflares rapidly release energy and heat the material in the active regions.

NuSTAR typically stares deeper into the cosmos to observe X-rays from supernovas, black holes and other extreme objects. But it can also look safely at the sun and capture images of its high-energy X-rays with more sensitivity than before. Scientists plan to continue to study the sun with NuSTAR to learn more about microflares, as well as hypothesized nanoflares, which are even smaller.

In this image, the NuSTAR data shows X-rays with energies between 2 and 6 kiloelectron volts; the Hinode data, which is from the X-ray Telescope instrument, has energies of 0.2 to 2.4 kiloelectron volts; and the Solar Dynamics Observatory data, taken using the Atmospheric Imaging Assembly instrument, shows extreme ultraviolet light with wavelengths of 171 and 193 Angstroms.

Note the green Hinode image frame edge does not extend as far as the SDO ultraviolet image, resulting in the green portion of the image being truncated on the right and left sides.

Image credit: NASA/JPL-Caltech/GSFC/JAXA

SVAS Main Events

July

SVAS Sponsors!

DISCOVERY MUSEUM
Science & Space Center

TelescopeS.NET
by Woodland Hills Camera & Telescopes

OPT Telescopes
800-483-6287

STELLARVUE

Agena AstroProducts

For sale: A Meade 8" LX90, Schmidt Cassegrain Auto Star. This scope has been lightly used, and improvements have been made. The GOTO apparatus, with aid of the GPS make it easy to locate your favorite objects. A basic set of eye pieces are included, including a Mars filter. The pictured right angle finder scope saves craning your neck locating targets. Also included is a 12 hour power source. I'm asking $900 and will accept reasonable counter offers.
Please contact Dave Compton.

For Sale, Meade 10" f4/5 Newtonian. Completely gone through and modified to make it easier and safer to use. The feet now have leveling adjusters and the drive motor has an on/off switch. The bands that secure the tube assembly are trapped so they can't come off. Both RA and Dec pivots were cleaned and greased, the drive clutch was cleaned and adjusted. The optic's are typical high quality Meade. The original 1.25 plastic focuser has been replaced with a metal 2" Orion with a 1.25" adapter. The mirror's were cleaned and collimated.

The scope comes with two eyepieces, a 1.25/15mm Kellner and a 40mm Scopetronix Maxview 2". A Stellarvue 8x50 right angle correct view finder that accepts eyepieces, and a Telrad are included. Designed for visual observations, it works fine with today's fast rate imagers (with careful polar alignment). Asking $1000,00, please make offer.
Contact Manya Hvizdak

Check out Cloudy Nights Classifieds for Used Astro Stuff

For sale: NexStar 11 GPS with a couple extra lenses. Asking $1,500 (50% off purchase price!), will consider reasonable offers.
Contact; Kurt Robinson

SVAS Officers

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 *Ramona Glasgow* *Bill Marquardt* *Chuck Real*

~ Odd Year Term ~

Tom Braun *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.

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.

Copyrights- Except for individually copyrighted articles, permission is granted to other amateur astronomy organizations to reproduce articles in whole or in part, for internal non-profit use, provided credit is given to the SVAS Observer and the authors of the reproduced materials. Copyrighted material appears in this publication solely for non-profit educational and research purposes, in accordance with title 17 U.S.C. section 107.

SVAS Membership Application

Date___/ ___ /___ **Membership** *(check one)* **New:** ___ **or Renew:**___

Annual Renewal Date June 1st (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** _____
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.

To: SVAS Membership Application
Detach, *SIGN*, & mail with payment.
PO Box 15274 –0274
Sacramento, California. 95851-0274