SVAS OBSERVER
Vol.72 No.3* May-June, 2015
Sacramento Valley Astronomical Society
Founded in 1945

2015 Elections

Greetings form the SVAS Board! We plan on a successful and **FUN** 2015. From left to right, Ramona Glasgow, David Macho, Charles Jones, Kevin Normington, Bill Marquardt, Chuck Real, Walt Heiges, Tom Braun, and Lonnie Robinson. Walt Heiges was elected president, Lonnie Robinson Vice President, Kevin Normington as treasurer, and our new secretary is Kevin Heider. Ramona, Dave, Charles, Bill, Chuck, and Tom are the odd year Board of Directors.

Our membership is increasing, and we want to encourage everyone to attend the SVAS meetings and support our great club. We are here to organize, assist, and be your representatives. We are listening to your desires, so let us know how you feel.

It's a sad year loosing our past President, Ross Gorman. He has given the SVAS so much in the way of organization and leadership, but he trained

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Inside This Issue

SVAS Event Calendar

May 5, Tues **Eta Aquarid Meteor Shower.**

May 15, Friday, General Meeting Friday at 8:00pm

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

May 16, Sat **Blue Canyon, weather permitting.**

May 17, Sun **New Moon, next Full Moon is called the Strawberry Moon.**

June 13, Sat **Blue Canyon, weather permitting.**

June 15, Mon **New Moon, next full Moon is called the Buck Moon.**

June 20-21, International Sun-Day at Dicsovery Museum

Contact Walt Heiges.

June 19, Friday, General Meeting Friday at 8:00pm

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

Star Party Schedule for 2015

Blue Canyon

May 16th
June 13th
July 17-18th, Star-B-Q
Aug 15th
Sept 12th
Oct 10th
Nov 14th
Dec 12th

Star Parties

Community Star Parties

Contact Wayne Lord

SVAS Main Events

International Sun-Day at Discovery Museum
Sat & Sunday, June 20 & 21!
SVAS

SVAS
July 11
Rusch Park
Family Camp Out

Star-B-Q
July 17-18

Yosemite
Contact
Tom Braun
Labor Day Weekend
Sept, 4 - 6

SVAS
Citrus Heights
Sunday FunDay
September 27th
Rusch Park
11:00am - 3:00pm

Messier Marathon
SVAS
East
West
Contacts
Charles Jones
Tom Braun
Lonnie Robinson
See page 7

SVAS SVAS.Org Membership Application

Sacramento Valley Astronomical Society

Founded in 1945

Date____/____/_____ Please check one: New Member_____ Renewing _____

Name:_____

Address_____

City_____ State_____ Zip Code:_____

Phone_____ E-mail:_____

Annual Renewal Date is July 1st

General Member $36

Prorate @ $3 per month

Observatory Member $84

Prorate @ $7 per month

Student $24

Prorate @ $2 per month

Dues $_____ Tax deductible contribution $_____ Total $_____

Observatory Membership

Observatory Membership offers the benefits of a general 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.

Sign & Mail To:

SVAS Membership App
PO Box 15274 –0274
Sacramento, CA.
95851-0274

Signature _____

Walt Heiges, SVAS President

SUN-DAY will be held at the
Discovery Museum
3615 Auburn Blvd, Sacramento
Sat & Sunday, June 20 & 21!
12:00pm - 4:00pm
Setup at 11:00am

916-808-3942
INFO@THEDISCOVERY.ORGhttp://
www.thediscovery.org/ http://

DISCOVERY MUSEUM
Science & Space Center

POWERHOUSE SCIENCE CENTER
Future Home of the Discovery Museum Science & Space Center
www.powerhousesciencec

Last year was such a successful and fun event, that we will be there again this year. Did I mention fun? Nothing like sharing our star with the many families visiting the Science Center on Old Auburn Blvd. Our telescopes cover the large entryway, and folks just can't miss us!

It 's a success because of you the members, coming out to support the SVAS and our President Walt Heiges. This is his public outreach passion, and I hope it will become yours. Warning, it's very contagious!

Bring your solar telescope, or not, a chair, sunscreen, cap, water, snack, and enjoy the friendships of other SVAS members. This year we will have two MallinCams, one belongs to the club, and the other to Walt. We will have big screens to display the Sun in all it's glory to the public. It's great fun to describe why the sunspots appear to a young curious adult. Come prepared to answer some tough questions from these curious minds.

Observer Editor

Charlie Bates Solar Astronomy Project

http://solarastronomy.org/sunday.html
www.facebok.com/groups/InternationalSUNday/
www.facebook.com/groups/batessolarastronomyproject/

Messier Marathon 2015-16

East SVAS West

Charles Messier
1730-1817

The Messier Marathon was Tim Tingey's favorite pet project. He would be pleased that we are continuing the tradition. Two Board Members have volunteered to make it happen, Charles Jones and Tom Braun. I will lend a hand too!

This is a natural for new and old members alike. I know I need a lot of practice to manually find all 110 Messier objects in one night. We would like to include special help for those new to astronomy, help with your new scope and learning the constellations. If you don't have a scope, no worries, we have several you can use at HGO from a 16" Dob to 8" Cassegrains. This is a great opportunity to try several scopes, and decide which one fits your needs best. Your scope choice will be a balance between your budget and how much you can lift. Bigger is always better, but portability is a huge issue. If it's too big and heavy, it just won't get used.

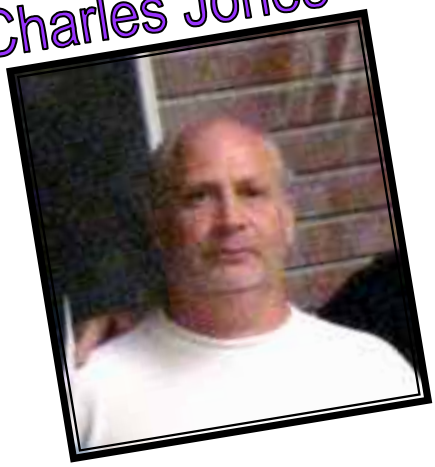
Traditionally, the Messier Marathon only utilized manual search for objects. While talking with Don Machholz (the father of the Messier marathon) this year, I ask his opinion. He said we need to include everyone, so using a computerized scope is fine. I'm thinking a special award is in order for completing all 110 objects, in one night, by the manual method! It's easier than you think to locate stuff with a Telrad finder only.

Our plan is to work on a few of the 110 objects at each star party throughout the year. Hopefully, when March, 2016, arrives you will be ready to tackle all 110 objects in one night. We will look at all sorts of objects as well. There seems to be about five major categories of object types; Galaxies, Globular Clusters, Open Star Clusters, Bright Nebula, and Planetary Nebulas. My favorite objects are Galaxies, especially edge on, what's yours?

Joining the group couldn't be easier, just attend the next star party, weather permitting, Sat, May 16th. We will be out in front (or inside) of the observatory, just ask for one of us. Bring a chair, red light, warm clothing, mosquito repellent, and perhaps a snack. We can brew some coffee in HGO. We will have star maps you can use, stay as late as you like, and we will try to bag 20 to 40 objects.

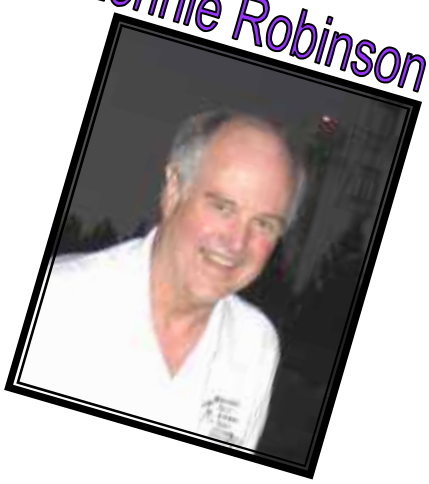
Call for more info, our contact numbers are on the last page. Looking forward to having a great time!

Charles Jones



Tom Braun

Lonnie Robinson



us well! We are still in touch by email and telephone, and his continued guidance is most welcome.

Here is a collection of some great photos from Star-B-Q a couple years ago. Ross receiving a merit award, congratulated by Walt Heiges, and posing together with Lonnie, Perry, and Walt. This was the year we had a visit from the Forrest Service patrolman, Ross was always there to take care of business.

I've told this story before; I stayed overnight knowing everyone from the Board had left for home. Waking up a bit late, I was sure the job of putting away the tent canopies would be all mine. I discovered Ross had already done it with other members help, and that really made my day!

The bottom photo is a recent get together and farewell dinner, with Kevin Normington, Lonnie Robinson, Perry P. Porter, and Ross Gorman, at BJ's Pizza. After a great meal, we traveled a short distance to the theater for an early showing of Interstellar. Great fun enjoying some time together away from SVAS duties!

Thank you Ross,
for some great years at the SVAS!

School Star Party Report

Contact Wayne Lord
star_geezer@yoahoo.com
916-396-7404

This is a special school star party report, because the SVAS just purchased a new Mallincam Jr., to help us share the heavens with young curious minds. The photo at right is first light for the new camera, and we had a great view of a distant tree from my backyard! Chuck Real is adjusting the camera settings, while Wayne Lord is presenting the view on the monitor. We (the Board) all felt this would be a fantastic tool to allow several people to view at the same time, while discussing the object.

The photos below show our first experience with the Mallincam under the stars. Wayne has a lot of experience with astrophotography, and it came in handy. The strange looking screen, or mask, over the end of his scope is called a Bahtinov mask. It is used to accurately focus a telescope camera by observing the angled diffraction spikes coming together to form a star like pattern. There are three patterns, two form and X and balancing the third center spike for equal left and right length indicates perfect focus. Very cool and makes focus much easier!

This was an exciting learning experience for all of us, and we set up the monitor a short distance away near Wayne's power supply. We used my old 8" Meade LX3 with tracking only, but it has JMI encoders and a Bluetooth connection to my tablet PC running Sky Safari. Go-to is desirable for fast object changes, but the push to system worked fine. Sometimes push-to can be faster than long go-to slews.

The first object was Jupiter, easy to center and very bright. Our lack of experience showed, and adjusting the camera to see the moons and Jupiter's surface detail at the same time was elusive. A short time after dusk, Chuck dropped by to lend a welcome hand. He suggested moving to the Orion Nebula, and after a few adjustments we had a great color view on the screen. Up until now there wasn't a lot of interest, but the nebula drew a small crowd. So many in fact, that we couldn't see the screen to refine the adjustments! Lessons learned, we need to figure out a way to securely support the monitor near the telescope. We also need to pay attention to safely routing the wiring, it's easy to trip on in the dark. I've never had so many folks wanting to look through my finder scope, since the camera was attached to the main focus! The Mallincam was a great success!

Now on to the star party report! We had a great turnout from the SVAS! Ten or more scopes in all and estimating 30-40 interested students and parents. With all the Mallincam setup issues, Wayne and I both realized time was wasting to get some pictures. There is a story with the photo of Tom Braun and Lisa Perez on the right. I took three photos, and all were out of focus. You can see the bit of attitude from Tom after asking for a fourth shot. He was kidding of coarse, and it turned out great. It's hard to see the two Buick's in the photo below, a fellow member, Nick Johonie, has a SUV like mine. Following suit to the Buick ads where no one knows where the Buick is, this may help the situation.

Wayne ask everyone to sign in, and identify their scope. Here is the list of attendees: George Foxworth (5" Refractor), Jay Schudel (10" Orion Dob), Lonnie Robinson (8" Meade), Wayne Lord (10" Coulter Dob), Tom Braun, Ray Brown (4" Meade Refractor), Nick Johonie (8" Celestron NexStar), Jim Carvalho (10" Dob), and Chuck Real. There were others who showed up later, sorry if we missed you!

This is a great way to get to know other members, join us next time sharing our hobby with the public. It's a very rewarding experience!

Observer Editor

Video Astronomy

A Tool for Enhanced Observing Part-1

by Chuck Real

Ever have that yearning for a new, bigger telescope to see deeper into the night sky? If you're like me you have other demands for your precious dollars; and besides, getting older makes it increasingly difficult to lug around bigger and bigger scopes. My vision isn't like it used to be either. How about enhancing your existing scope with a gadget that effectively triples its aperture, allows capturing mag 20 or better stars, and turns those faint fuzzies into beautiful galaxies, star clusters and nebulae…and does so in a matter of seconds, in full color, on your HD television for a fraction of the cost of an equally-performing new telescope? Sounds like magic, but that's what an astronomical video camera can do for that old scope of yours….I know, because it did that for mine. This article takes a brief glimpse of the capabilities and underlying technology, and is part 1 of a series that will help to unravel the mystery of the new video astronomy that is catching on like wildfire.

Although astronomical imaging has been around for decades, the use of video cameras for observing is comparatively new. Video cams for observing the moon and planets have been around for more than 10 years; however, advances in sensor technology, driven by the demand for light-sensitive surveillance cameras for security purposes, has been a game-changer for deep-sky astronomical use. As an entry to the technology let's take a look at the principal differences between astronomical video cameras and digital cameras made for astrophotography, both in design and purpose.

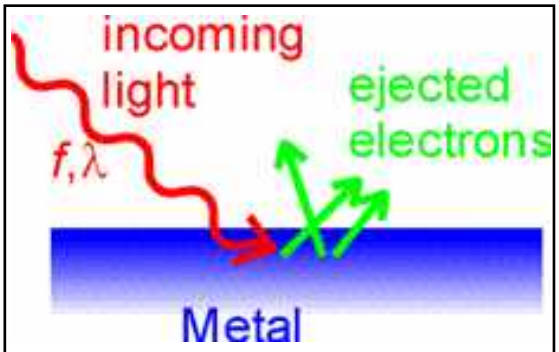


Figure 1. The **photo-electric effect** is the release of electrons in certain metals such as Gallium via an exchange of energy when struck by photons.

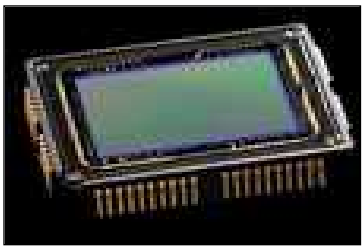


Figure 2. Typical integrated-circuit charge-couple device.

Both types of cameras utilize digital sensor technology via the charge-couple device (CCD); an integrated circuit that converts light energy into an electric current that varies with the intensity of the light. This is made possible by the photo-electric effect (figure 1), a discovery by Albert Einstein in 1904 that gave him a Nobel Prize in 1921. Certain metals, like Gallium (atomic number 31 on the periodic table of elements), release electrons when struck by particles of light called photons. Sensor chips are composed of an array of sensor elements each of which constitutes a single pixel, or picture element (figure 2). Digital circuitry inside the camera then takes the varying voltage from each pixel to form a video signal that is displayed on a monitor. Color sensors have color micro-filters that cover alternating rows of pixels in red, green, and blue, which are then combined to form a color image. To enhance sensitivity, high quality sensors used in astro-video cameras also cover each pixel with a micro-lens (figure 3) that concentrates the incoming light onto the sensing material,

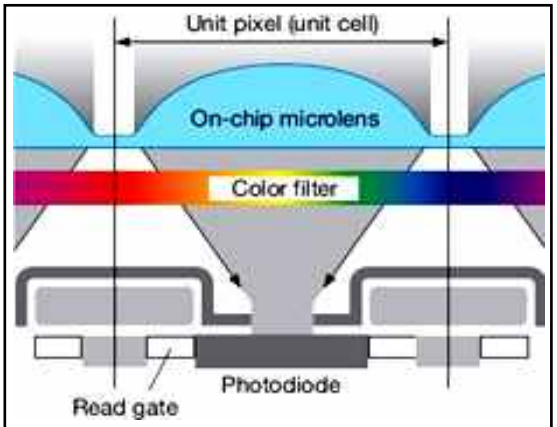


Figure 3. Cross-section diagram of a **single CCD pixel** (courtesy of Sony Corporation).

thereby increasing the number of photons being captured. The technology results in light sensitivity more than 100,000 times greater than the human eye over a broad spectral range of astronomical interest, including the near infra-red.

The principal difference in the two types of cameras is in the type of sensor, which defines the intended purpose for which each are designed. Astro-imaging camera sensors are generally smaller, but have very high pixel density, which results in very high resolution images great for displaying subtle details for astronomical portraits. These smaller pixels, however, are less sensitive to light and consequently long exposures (minutes to hours) are necessary to gather enough photons (charge) to capture the object. On the other hand, astro-video cameras have larger sensors (and pixels) that enable capturing many more photons in less time (seconds) making them useful for near-real time viewing, but the larger pixel size results in lower resolution. Thus the tradeoff with astro-video cameras is rapid viewing of astronomical objects at the expense of detail in the image; different cameras designed for different purposes….near-real time observing verses portrait astro-photography.

The sensor is not the only component of astro-video cameras that enables rapid formation of images, but also the multiple frame generation inherent in video capture. Rather than capturing motion as most video cameras are designed for, astro-video cameras use the streaming of multiple frames to continuously collect photons emanating from a faint object, and accumulate enough electric charge in digital memory from each pixel to form an image. Think of it as an electronic bucket brigade of photons (figure 4). This is analogous to a long exposure, only benefitting from the fact that standard U.S. video kicks out 30 frames per second. In less than a minute hundreds of frames can be summed to reveal very faint, otherwise invisible objects. Many video astronomy enthusiasts point out that use of this technology can more than triple the effective aperture of a telescope, allowing an 8 inch SCT, for example, to quickly capture 20th magnitude stars, performing like a 20 inch scope. Firmware inside the camera digitally enhances the image data, reducing noise, and converts the output into standard composite or s-video signals. Software can optionally be used to control video cameras, which can further visually enhance the image on-the-fly, performing contrast stretching, noise reduction via stacking, color balancing, and so on; but that's another story.

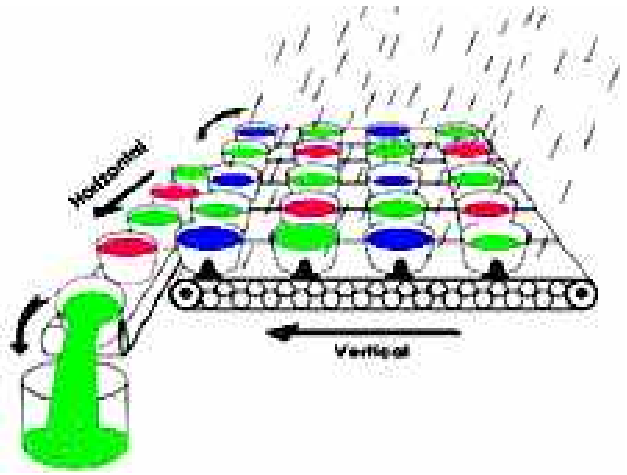


Figure 4. Incoming photons create an accumulating electric charge that is stored in shift-register memory.

This brief segment only grazes the surface of this exciting new dimension of amateur astronomy. Subsequent segments will delve into the entry-level costs, necessary and recommended accessories, and observing tips to help get the most out of this new method of enhanced observation through your telescope.

The (Almost?) Total Lunar Eclipse April 4

by Ralph Merletti

I observed the early morning lunar eclipse of April 4th, 2015, mostly from my place in the Fruitridge area of South Sacramento. I observed with my usual array of equipment including my 3" Swift refractor at 25x and 111x, a 10x finder scope, and my 10x50 Orion Vista binoculars. I also set up an earth globe on top of an A-frame ladder to replicate the approximate orientation/position of the Earth and Moon, to take some flash pictures. I was accompanied by a neighbor tenant, with an increasing interest in astronomy, who took the lunar eclipse photos shown on this page (near mid-eclipse and after-- as the Moon was uncovered) through my 10x finder scope with his I-phone.

As expected, the partial umbral phase advanced slowly because the Moon's entry was at a tangent into the northern portion of the Earth's shadow. As the time of "totality" approached, there were two surprises: First, the eclipse was darker than I expected, but with the lunar Maria still easily visible (brightness: L = 2.5) with more uniform umbral shading. Second, the sliver of white light on the Moon's north polar limb never disappeared! At mid-eclipse the Moon looked more like Mars--with a bright "polar cap", a gray rim, and dark red/orange/brown color (coloration: L = 1.5).

As the Moon was slowly uncovered at a tangent, the Grimaldi (large basin) area within the umbra looked a little brighter. After the Moon was more than half uncovered in the brightening dawn twilight, it began to slip into some trees/vegetation. I decided to put away most of my equipment, except for my binoculars and my one-use type cameras. Then I drove a few blocks to capture the mostly uncovered moon closer to the horizon, but was not in time to observe the actual moonset from the Fruitridge overpass of the 99 freeway. After parking near the far west end of the overpass and hustling on foot up the north side of the bridge, high thin clouds from an approaching storm system made the situation even more difficult.

Well, so much for the predicted third of four consecutive "total" lunar eclipses! What happened??? Stay tuned! Meanwhile, check out the internet chatter, and upcoming issues of Sky & Telescope and Astronomy magazines. I'll have much more to say about this later.

Astro AP Photography

by Wayne Lord

I have finally got out to do some imaging, and since the Moon was pretty full that night, decided to tackle some northern targets well away from the moon glow. It had been quite a while since I had set up for imaging, and this was the first real trial for my new SBIG camera. I was pleased to be able to get both **M81 & M82 galaxies** in one image, and even managed to get some of the spiral arms of M81 to show up.

Imaged with an Orion 8" Astrograph on an Orion Sirius mount, guided, and an SBIG sT8300C camera. Forty minute total exposure (8 5-minute exposures stacked and pre-processed with Nebulosity and post-processed with Fits Liberator and Photoshop CS3).

Project Mercury Astronauts

On April 9, 1959, NASA's first administrator, Dr. Keith Glennan, announced the names of the agency's first group of astronauts at a news conference in Washington, D.C. Now known as the "Original Seven," they included three Naval aviators, M. Scott Carpenter, Walter M. Schirra Jr., and Alan B. Shepard Jr.; three Air Force pilots, L. Gordon Cooper Jr., Virgil I. (Gus) Grissom, and Donald K. (Deke) Slayton; along with Marine Corps aviator John H. Glenn Jr. This group photo of the original Mercury astronauts was taken in June 1963 at the Manned Spacecraft Center (MSC), now Johnson Space Center, in Houston, Texas. The astronauts are, left-to-right: Cooper, Schirra, Shepard, Grissom, Glenn, Slayton and Carpenter.

Project Mercury became NASA's first major undertaking. The objectives of the program were to place a human-rated spacecraft into orbit around Earth, observe the astronaut's performance in such conditions and safely recover the astronaut and the spacecraft. **The Mercury flights proved that humans could live and work in space, and paved the way for the Gemini and Apollo programs as well as for all further human spaceflight.**

Image Credit: NASA

Celebrating Apollo "Earthrise"

Apollo 8, the first manned mission to the moon, entered lunar orbit on Christmas Eve, **Dec. 24, 1968**. That evening, the astronauts-Commander Frank Borman, Command Module Pilot Jim Lovell, and Lunar Module Pilot William Anders-held a live broadcast from lunar orbit, in which they showed pictures of the Earth and moon as seen from their spacecraft. Said Lovell, "The vast loneliness is awe-inspiring and it makes you realize just what you have back there on Earth." They ended the broadcast with the crew taking turns reading from the book of Genesis.

Image Credit: NASA

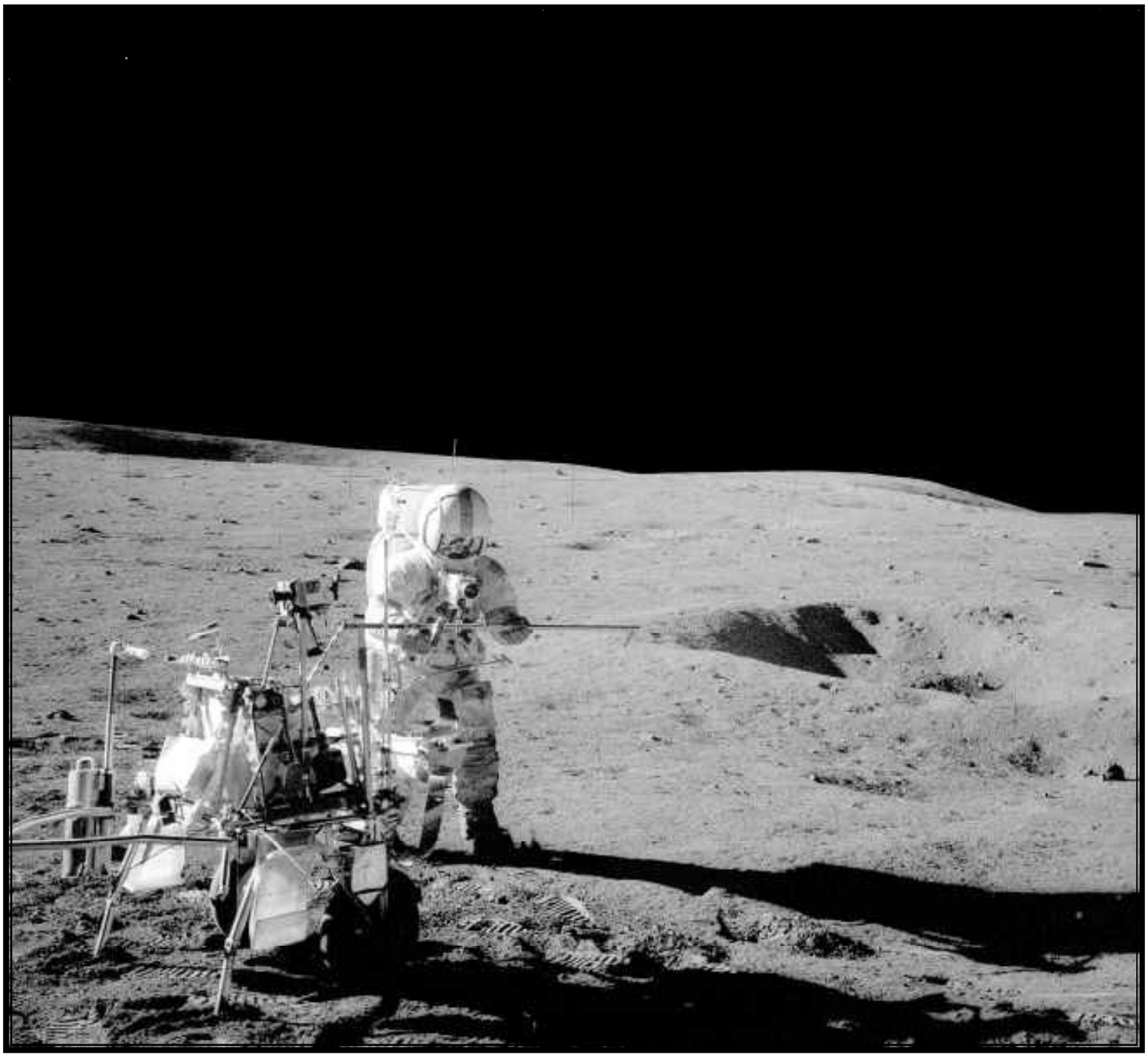
Apollo 13, Mission Control, Houston, April 13, 1970

Apollo 13, NASA's third crewed mission to the moon, launched on April 11, 1970. Two days later, on April 13, while the mission was en route to the moon, a fault in the electrical system of one of the Service Module's oxygen tanks produced an explosion that caused both oxygen tanks to fail and also led to a loss of electrical power. The Command Module remained functional on its own batteries and oxygen tank, but these were usable only during the last hours of the mission. The crew shut down the Command Module and used the Lunar Module as a "lifeboat" during the return trip to Earth. Despite great hardship caused by limited power, loss of cabin heat, and a shortage of potable water, the crew returned to Earth, and the mission was termed a "successful failure."

This photograph of the Mission Operations Control Room in the Mission Control Center at the Manned Spacecraft Center (now Johnson Space Center), Houston, was taken on April 13, 1970, during the fourth television transmission from the Apollo 13 mission. Eugene F. Kranz (foreground, back to camera), one of four Apollo 13 flight directors, views the large screen at front as astronaut Fred W. Haise Jr., Lunar Module pilot, is seen on the screen.

Image Credit: NASA

Apollo 14 Touchdown Just 44 years agao!



On **Feb. 5. 1971, the Apollo 14** crew module landed on the moon. The crew members were Captain Alan Bartlett Shepard, Jr. (USN), commander; Major Stuart Allen Roosa (USAF), command module pilot; and Commander Edgar Dean Mitchell (USN), lunar module pilot. In this photo, Shepard stands by the Modular Equipment Transporter (MET). The MET was a cart for carrying around tools, cameras and sample cases on the lunar surface. Shepard can be identified by the vertical stripe on his helmet. After Apollo 13, the commander's spacesuit had red stripes on the helmet, arms, and one leg, to help identify them in photographs.

Image Credit: NASA

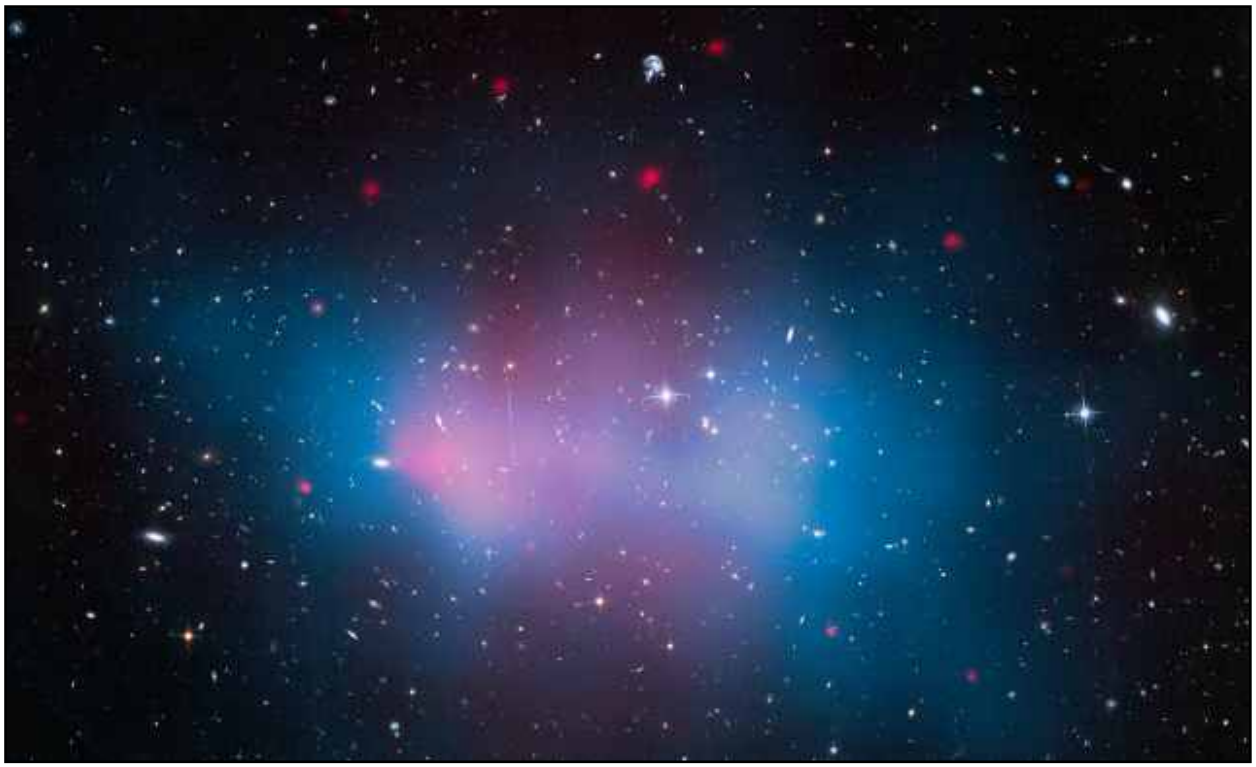
The heavyweight champion of the Cosmos

By Dr. Ethan Siegel

As crazy as it once seemed, we once assumed that the Earth was the largest thing in all the universe. 2,500 years ago, the Greek philosopher Anaxagoras was ridiculed for suggesting that the Sun might be even larger than the Peloponnesus peninsula, about 16% of modern-day Greece. Today, we know that planets are dwarfed by stars, which themselves are bound together by the billions or even trillions into galaxies.

But gravitationally bound structures extend far beyond galaxies, which themselves can bind together into massive clusters across the cosmos. While dark energy may be driving most galaxy clusters apart from one another, preventing our local group from falling into the Virgo Cluster, for example, on occasion, huge galaxy clusters can merge, forming the largest gravitationally bound structures in the universe.

Take the "El Gordo" galaxy cluster, catalogued as ACT-CL J0102-4915. It's the largest known galaxy cluster in the distant universe. A galaxy like the Milky Way might contain a few hundred billion stars and up to just over a trillion (10^{12}) solar masses worth of matter, the El Gordo cluster has an estimated mass of 3×10^{15} solar masses, or 3,000 times as much as our own galaxy! The way we've figured this out is fascinating. By seeing how the shapes of background galaxies are distorted into more elliptical-than-average shapes along a particular set of axes, we can reconstruct how much mass is present in the cluster: a phenomenon known as weak gravitational lensing.



That reconstruction is shown in blue, but doesn't match up with where the X-rays are, which are shown in pink! This is because, when galaxy clusters collide, the neutral gas inside heats up to emit X-rays, but the individual galaxies (mostly) and dark matter (completely) pass through one another, resulting in a displacement of the cluster's mass from its center. This has been observed before in objects like the Bullet Cluster, but El Gordo is much younger and farther away. At 10 billion light-years distant, the light reaching us now was emitted more than 7 billion years ago, when the universe was less than half its present age.

It's a good thing, too, because about 6 billion years ago, the universe began accelerating, meaning that El Gordo just might be the largest cosmic heavyweight of all. There's still more universe left to explore, but for right now, this is the heavyweight champion of the distant universe!

Learn more about "El Gordo" here:
Http://www.nasa.gov/press/2014/april/nasa-hubble-team-finds-monster-el-gordo-galaxy-cluster-bigger-than-thought/

Image credit: NASA, ESA, J. Jee (UC Davis), J. Hughes (Rutgers U.), F. Menanteau (Rutgers U. and UIUC), C. Sifon (Leiden Observatory), R. Mandelbum (Carnegie Mellon U.), L. Barrientos (Universidad Catolica de Chile), and K. Ng (UC Davis). X-rays are shown in pink from Chandra; the overall matter density is shown in blue, from lensing derived from the Hubble space telescope. 10 billion light-years distant, El Gordo is the most massive galaxy cluster ever found.

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 $1300 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 17 to 40mm eyepieces, and a Telrad are included. Designed for visual observations, it works fine with today's fast rate imagers (with careful polar alignment) and quite well with Orion's Deep Space Video Camera. Asking $1000,00. Contact Manya Tingey

For Sale: Celestron (Ultima 8 -PEC) 8 inch Schmidt-Cassegrain telescope with tripod. (includes instruction manual and metal case for telescope) Telescope is about 20 years old but in very good condition. Also includes the following eyepieces: Celestron Ultima Series 30 mm, 18 mm, 7.5 mm, and 2x Barlow. Asking $1,200. If interested, please contact James Wurschmidt

For sale: NexStar 11 GPS with a couple extra lenses. Asking $2,000, 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 ~

Gary Shuluk *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	Liam McDaid
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
Messier Marathon	Charles Jones / Tom Braun
HGO Maintenance Director	Stuart Schulz
Amateur Telescope Making	Lonnie Robinson / Bill Thomas

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.

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SVAS Membership Application

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

Annual Renewal Date 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.

Detach, *SIGN*, & mail with payment.

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