ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 61, No. 2 - February 2013

Wednesday, February 20, 2013
SAN FRANCISCO AMATEUR ASTRONOMERS

ANGIE AND DOUG TRAEGER - HOW TO MEET BAT PEOPLE

Practical Observational Astronomy is one of several science and nature oriented classes offered at the San Francisco State University's Sierra Nevada field campus every summer. Doug and Angie Traeger, SFAA members, attended and participated in the astronomy course in the summers of 2011 and 2012. They would like to share their experiences. They'll cover the ins and outs on a week-long course that includes lectures in the day and guided observing at night.

Doug and Angie have been active amateur astronomers for 13 years, and they each have their own dobsonian telescopes. They travel to observe together.

ROBERT DOUGLAS - TITIRO ETU

Early Polynesian navigators from the Cook Islands and Tahiti sometimes used titiro etu (star peekers). These were made using coconut shells. In a sense, a titiro etu substituted for not having a more modern sextant. Each titiro etu was designed for a known island associated with a particular star. The instrument allowed navigators to determine when they were on the latitude of the destination island.

Ever since grade school, Bob had been interested in astronomy and space travel. When he was 13, his father bought him a 2.4-inch f/15 Unitron refracting telescope. At the University of Washington, Bob received a BS, MS and PhD degrees in mathematics. He came to San Francisco State University as an Assistant Professor of Mathematics in 1969, and was in the Mathematics Department for about the first 15 years. He then switvhed into the newly-created Computer Science Department for another 15 years. Bob has taken eight trips to Australia for observing the southern skies, including two total solar eclipses there.

PAUL SALAZAR - SOLAR AND LUNAR ECLIPSES, PAST, PRESENT AND FUTURE.

In this talk, Paul will provide an overview of one of the most riveting astronomical phenomenon, eclipses. They happen with regularity, but sometimes you need to travel to see one, and other times they come to you. We'll recap a few recents eclipses, and talk about the next few years worth of good eclipses, as well as discuss some of the more interesting aspects of solar eclipses.

Paul Salazar is an amateur astronomer and blogger, speaking on astronomy at various venues including Mt. Tam and Yosemite, and on KFOG and KALW radio. He lives in San Francisco, and is a business executive at a startup in Silicon Valley called Skytree.

PRESIDENT'S MESSAGE

Hello SFAA! It is an honor to take on the role of President of the San Francisco Amateur Astronomers. As Ireflect on the accomplishments, talents, and skills of Sue-Ellen Speight and our former SFAA Presidents, I feel like someone just handed me the keys to a Ferrari. Actually, the "keys" were handed over on January 19 at our Annual Awards Dinner, where the guard officially changed over to our 2013 crew.

Thanks to our outgoing board members – Michael Farino, Dave Frey, and Jessica Santascoy. They each contributed to or club's operations over the course of the year. We have two new officers this year. Matt Jones, a prior board member and our Webmaster, is taking on the role of Vice-President. Michael Patrick, also a prior board member, has graciously offered to take on the role of Treasurer and is already busily processing new memberships, mailing out parking passes, and categorizing expenditures. We have three new board members, Paul Salazar, Sunil Nagaraj and George Teiber. Thanks to all of you for making a substantial commitment to the club. We are keeping some secrets and can't tell you who won each of our club's traditional awards – the "Service Award," the "Observer of the Year Award," and the club's highest honor, the "Herman Fast Award." Believe it or not, none of the recipients were at the Awards Dinner. We did, however, have a fine "Installation Dinner" and reveled in a fun evening together. We'll announce the awards after they have been presented to the recipients.

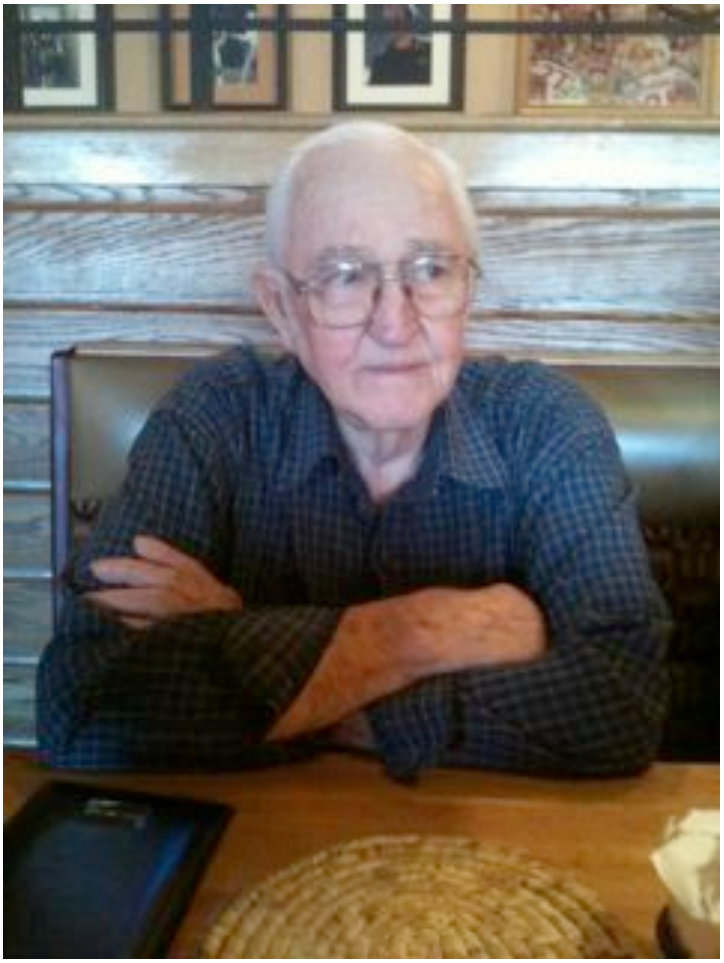
At the Awards Dinner, I spoke a bit about what I think our mission should be in 2013, citing the organizational documents that I came across while in the role of club Treasurer. As our Articles of Incorporation state it, the purpose of our club is to "carry on an educational program in astronomy and kindred subjects among the members of the association, the general public; and to affiliate with other astronomical associations; and to engage in any other lawful activity." (Boring!) The way that our By-Laws state this is more short and sweet, which is to "promote and popularize astronomy and related disciplines." Setting legal language aside and putting this into my own words: *We are the Welcome Mat for amateur astronomy.* As an astronomy club, we provide an important resource to residents of San Francisco County, Marin County, and the Bay Area. My desire is that in 2013 every person who is one of our first time visitors, just becoming acquainted with the world of amateur astronomy, finds us to be friendly and helpful. Feel free to remind me of this goal if the next time we are on Mt. Tam at an SUP as you find me rambling on about whether my husband Doug and I should attend GSSP or CalStar, put an EQ platform or have DSC's and GOTO installed on my Dob, or if I say,"my target's transiting, excuse me while I get back to NGC 128!"

May 2013 Bring us fantastic skies, some dramatic comets, and some bolides that can show up when we're NOT inside for our General Meeting.

With Thanks and commitment, I Am looking forward to serving as your President for the coming year.

ANGIE TRAEGER
President
San Francisco Amateur Astronomers
2013

REMEMBERING
ART OWENS
LONG-TIME SFAA MEMBER



We are sad to report the passing of our dear friend and long-time SFAA member, Art Owens, from complications of pneumonia on December 23rd.

In 1999, Norman and I met Art and his wife, Chelle, who was the SFAA Treasurer for many years.. We brought our brand new telescope to Mount Tamalpais, with no knowledge of how to put it together and no real knowledge of the night sky. Someone said we should join SFAA, and meet Art and Chelle because they were the first members to own a go to telescope like ours. They were early adopters of computers and new technology for their observing. We would be in good hands. And we gained two wonderful friends.

Art would frequently meet us for coffee, bringing manuals, eyepieces and his years of knowledge to share with us. The four of us went to many star parties together and traveled with our telescopes to various locations. One of the first things Art introduced us to was the beautiful Owl Cluster, NGC 457, in Cassiopeia, and we will always remember his enthusiasm in sharing his favorite objects with us. He could always be found with his 12" Meade telescope on "his" spot on Mt. Tam , at the south-western most end of the parking lot, delighted to share his favorites with the people standing in line in the dark.

And if the clouds rolled in, and we had to shut down, he was sure to say, "There'll always be pie!" There never was a really disappointing night, because we four would go for pie and discuss astronomy till the wee hours.

Art's email address was SunManArt, and he was especially passionate about the sun. He checked the SoHo website every day, and owned a fine solar scope. He would arrive early at any star party to show everyone the wonders of the sun. He loved to study solar science and gave two talks to SFAA and to other bay area clubs, and venues. He also owned a Van de Graaff generator and enjoyed demonstrating it at his talks, getting volunteers' hair to stand on end, and explaining the science at work. For the annular solar eclipse last May, we shared a spot in front of a Novato restaurant with Art and Chelle. He delighted children and adults who returned to his solar scope time and again for the views and his knowledge. We will always miss these special times with Art.

Many SFAA members held Art Owens in friendship and high regard. His spirit will live on in the many people who looked up, with him.

Linda and Norman Mahan

To send condolences to Chelle Owens, email her at: chelle422@gmail.com

IMPORTANT DATES
&
UPCOMING SFAA VIEWING EVENTS

SFAA GENERAL MEETINGS & LECTURES

Randall Museum, 199 Museum Way (Near 14th Street and Roosevelt)
Third Wednesday of each month: 7:00 p.m. Doors open. 7:30 p.m. Announcements. 8:00 p.m. Speaker

SFAA BOARD MEETINGS IMMEDIATELY PRECEDE GENERAL MEETINGS AND BEGIN AT 6:00 P.M.

February 20, March 20, April 17, May 15, June 19, July 17, August 21,
September 18, October 15, November 20, December 18

CITY STAR PARTY

Saturday, February 16
See details in newsletter

2010 MT TAM SPECIAL USE PERMIT STAR PARTIES
MEMBERS ONLY

SPECIAL USE PERMIT observing nights on Mount Tamalpais are private, open *only* to SFAA members.
Please arrive by sunset. SFAA/Mt. Tam permit required for each car.
We must vacate the mountain by 2:00 a.m. except on specially approved nights
(such as Messier Marathon).

ALWAYS ON A SATURDAY
February 9, March 9, April 6, May 4, June 8, July 6, August 3, August 31,
October 5, November 2, November 30

MT TAM PUBLIC STAR PARTIES (April through October)

Public nights on Mount Tamalpais start with a lecture in the Mountain Theatre
followed by public viewing in the Rock Springs parking lot.
SFAA members may view privately after crowd departs from approx. 11 pm-2 am.
For more information: http://www.sfaa-astronomy.org/starparties/

2013 Dates: April 13, May 11, June 15, July 13, Aug 10, Sept 7 and Oct 12

UPCOMING LECTURES

MARCH 20, 2013 - DR. RALPH KAEHLER
SCIENTIFIC VISUALIZATION IN NUMERICAL ASTROPHYSICS AND COSMOLOGY

Three-dimensional movies of the birth of the first stars in the Universe are just some of the stunning visuals at the Schwob Computing and Information Center, a resource at KIPAC's Computational Physics Department. The visualizations are based on large-scale computer simulations that model complex astrophysical and cosmological processes, ranging from the formation of the first galaxies to the motion of dark matter on cosmic scales. In his presentation, Ralf will describe the role of scientific visualization in cosmological research, explain how he develops and employs state-of-the-art computer graphics techniques to produce the visualizations, and show us many examples of images and animations resulting from the work done at KIPAC. Dr Ralf Kaehler is a computational scientist at KIPAC, the Kavli Institute for Particle Astrophysics and Cosmology. He manages KIPAC's visualization laboratory, designs and implements computer graphics software and produces astrophysical images and movies that have been presented worldwide on numerous covers of magazines, in planetarium shows and TV documentaries.

This is one lecture you won't want to miss! (sent by an enthusiast who heard this lecture!)

APRIL 17 – GASPARD DUCHENE
PLANET FORMATION AND STELLAR MULTIPLICITY:
INSIGHTS FROM RECENT SURVEYS AND PERSPECTIVES GASPARD DUCHENE UC BEREKLEY

While the prevalence of stellar multiplicity has been known for many decades, it is now becoming increasingly clear that planetary systems are also frequent around Main Sequence stars. This raises the natural question of the connection between stellar multiplicity and planet formation, a topic that was mostly ignored until the last few years. Does the presence of a stellar companion alter, prevent or promote the formation of planets? In which way? Characterizing observational trends as a function of the stellar companion's mass and orbital properties can help identify the most important physical effects induced by the companion, if any. In this talk, I will review some key results from a number of recent surveys based on the Spitzer, Kepler and Herschel space observatories, as well as ground-based facilities. Building on these surveys, I will draw a global picture of our current understanding of the subject and will propose that, while planetary systems exist in a very diverse range of multiple stellar systems, they may not all form through the same process.

MAY 15 - ANTHONY AGUIRRE, Assistant Professor of Physics, University of California, Santa Cruz
MULTIPLE UNIVERSES & COSMIC INFLATION-THE QUEST TO UNDERSTAND OUR UNIVERSE (AND FIND OTHERS)

About a decade ago, scientists completed a great transformation in the understanding of our cosmos, establishing a broad and deep understanding of how the observable universe has evolved from a hot, dense state 13.7 billion years ago. Yet a second, even bigger transformation may now be taking place, because this understanding points to an early epoch during which the universe expanded at a stupendous rate to create the vast amount of space we can observe.

Cosmologists are now coming to believe that this "cosmic inflation" may do much more: In many versions, inflation goes on forever, generating not just our observable universe but also infinitely many such regions with similar or different properties, together forming a staggeringly complex and vast "multiverse". Dr. Aguirre will trace the genesis of this idea, explore some of its implications, and discuss how cosmologists are currently seeking ways to test this idea by actually searching for hints of other universes. Don't miss this introduction to one of the most mind-boggling parts of modern astronomy.

JUNE 19 TOM ZOBRIST
BUILDING THE WORLD'S LARGEST TELESCOPES: THE FUTURE OF GROUND-BASED ASTRONOMY

Tom Zobrist will recap his experience working at the Stewart Observatory Mirror Laboratory (SOML) helping to build the world's largest astronomical telescopes, including LBT, GMT, and LSST. Tom will discuss how LSST will allow every amateur astronomer to have access to an 8.4 m research-grade telescope, and about the race between GMT and its competitors, the Universities of California led Thirty Meter Telescope and the European Extremely Large Telescope, for the title of World's Largest Telescope.

Tom Zobrist *received his PhD in Optical Engineering from the University of Arizona. He worked as a metrologist and optical research engineer at the Optical Sciences Center and Stewart Observatory Mirror Laboratory in Tucson, AZ between 2003 – 2011. During that time he helped develop numerous optical metrology systems for measuring the surface figure of precision optics and astronomical mirrors for many of the world's largest astronomical telescopes. In 2011, he made a career change from supporting the fabrication of the world's largest optics to supporting the world's largest optical system: the National Ignition Facility at Lawrence Livermore National Laboratory, where he supports target and diagnostic alignment activities.*

SAN FRANCISCO AMATEUR ASTRONOMERS
CITY STAR PARTY

SATURDAY
FEBRUARY 16, 2013

New Scope Forum City Star Party
At this February's CSP, we will be offering a New Scope Forum, in which we invite anyone to bring out their new telescope and get some assistance from experienced amateur astronomers on setting up and using their scope. Many people get a new scope (or buy one for their kids), and look at the Moon or one planet, after which the scope goes into a closet and gathers dust. We want to change that and put your scope to work in ways you did not know you could use it.

We will be setting up the City Star Party before dark, around 5pm, and will conduct a short session on setting up your scope, and offer some hands-on help to get your telescope ready so that when darkness sets in, you can put your scope to work seeing many more items in the night sky.

Clear skies from the CSP team!

Date: Saturday, 2/16/2013

Time: 5:00 PM

Location: Land's End- Point Lobos, El Camino del Mar St, San Francisco, CA (Get Directions)

Event Location

Land's End- Point Lobos
City Star Parties are held at this location throughout the year. Check the Club Calendar for a schedule.

Address: El Camino del Mar St
San Francisco, CA
(Get Directions)

Check Weather Forecast

SFAA City Star Parties

Notes:
Northbound on the Great Highway, follow the highway as it becomes Point Lobos Avenue and passes the Cliff House. After you pass a small road called Merrie Way, take the next left onto El Camino Del Mar and follow the road uphill. You will pass Seal Rock Street on your right and will see a "Not a Through Street" sign and another sign for Fort Miley. Continue until the road ends in a parking lot.

Contact **SFAA** for more information.
Email this Club

SAN FRANCISCO AMATEUR ASTRONOMERS
ANNUAL DINNER
January 19, 2013
PERRY'S EMBARCADERO
San Francisco

Refreshments Thank You's, with Outgoing President Sue-Ellen, James Mace, Incoming President Angie Traeger, Doug Traeger, and Anil Chopra

Matt Jones, winner of "SFAA's Air Mattress Astronomer Award" for Throwing an Exceptional Perseids Meteor Shower Party

Past President Dave Frey, Outgoing President Sue-Ellen Speight
Past President Michael Portuesi, Incoming President Angie Traeger

More
photos
can be found
on our website
here:
http://www.sfaa-astronomy.org/member_images/?album=all&gallery=16

LIGHT POLLUTION: CAUSES, EFFECTS AND SOLUTIONS

By Sophia Lahey
Sir Francis Drake High School

Sophia Lahey is a member of SFAA and a Junior at Sir Francis Drake High School . She has been interested in and involved in astronomy since middle school and, for three years, has volunteered with the Mt. Tam Astronomy Program. The seed for this article started in a research project during 8th grade; this article has been added to every year since then. Sophia is also working on a light polllution ordinance for her town, Fairfax.

The main type of pollution people usually think of when they see the word "pollution" might be air pollution caused by cars and factories, or maybe big oil spills threatening the Gulf Coast. There's another type of pollution that negatively effects the environment not quite as obvious as a smog haze. If you live in an urban or suburban area all you have to do to see this type of pollution is go outside at night and look up at the sky. The glow you see blocking the stars is called light pollution.

"The view on the left is the view most people had from home only 25 - 50 years ago... and the view on the right is what the majority of Americans now see from their backyard. These photos show approximately the same area of the sky; one was taken from a rural area and one was taken from outside a small city (Springfield, MA)." Photo credit: *rocketroberts.com*

Light pollution is the pollution caused by misplaced artificial light. It is a growing problem that threatens wildlife, humans, natural habitats, our energy use and the heritage of appreciation for our night sky. Leaving lights on in vacant buildings, outdoor lights pointing up to the sky and unshielded outdoor lights all contribute to light pollution or sky glow. There are 4 different components of light pollution:

Urban Sky-glow: Artificial lights that are pointed upwards or misplaced cause the sky to unnaturally "glow" blocking the view of stars.

Light trespass: light that lands in areas where it is not wanted or needed. Example: light from a neighbor's house is also lighting up your back yard.

Glare: the bright uncomfortable light that comes off of poorly built lamps. This causes a decrease in visibility.

Clutter: a grouping of bright light (Example: New York City) contributing to sky-glow, trespass, and glare.

An example of Light Trespass and Glare

Photo credit: ***International Dark Sky Association***

Urban sky glow and clutter obscure our ability to see the stars at night. For example, a person living in the middle of nowhere could see around 2,000 stars while someone who lives in the city would be lucky to see a few stars. Because the stars are blocked out by light pollution, astronomers find it hard to search the cosmos for new galaxies or planets. Astronomers around the world have been publicizing how light pollution negatively impacts astronomical observation. Because of this many believe light pollution only concerns scientists working in the field of astronomy, which could be why the topic is often overlooked when modern environmental threats are discussed. And no one bothers to question why there are fewer and fewer visible stars if they grew up viewing a night sky blocked by light pollution. In fact, 80% of the US population can't see the Milky Way from their back yard.

Some people are very concerned about the ever increasing levels of light pollution as urban and suburban sprawl continue to grow. Not just astronomers, but also everyday people. Many believe that excessive artificial light at night separates us from our history and from our heritage of appreciating the night sky bringing us closer to nature. Feeling separate from nature can cause people to not care about it or understand it. And research shows light pollution can also harm our habitat and our health.

Light Pollution and Humans

Light pollution has consequences for human health. Night vision can be severely impacted. Glare on the eyes from excessive night lighting can cause **disability glare**. Disability glare is glare from roadway lighting that is so bright it causes us to avert our eyes. Older drivers are particularly vulnerable to disability glare. Disability glare reduces:

· Ability to distinguish contrast
· Color perception

The aging eye is also susceptible to eyestrain and loss of night vision.

The circadian rhythm is the 24-hour cycle that our bodies run on and what keeps us happy and healthy. Studies show that disruption of this cycle can lead to insomnia, depression, cancer, and cardiovascular disease. Over exposure to artificial light causes your circadian rhythm to be thrown off, possibly leading up to these severe side effects over time.

Melatonin: a hormone called Melatonin is what maintains a natural sleeping rhythm. Artificial light affects this rhythm, decreasing the levels of melatonin in your body. Melatonin is only produced in the darkness. Even a little exposure to artificial light will disturb the melatonin production. If there is a light shining through your window, make sure to block it with something.

Light Pollution and Wildlife

Light pollution also negatively affects animals in a bigger way than most would think. The sky glow from towns and cities cause nocturnal wildlife around the world to experience a loss of their night ecosystem.

Mammals: Mammals lose a lot of their internal night systems due to over lit areas. Nocturnal animals such as raccoons, bats, and deer suffer greatly, causing a decrease in population, difficulties with finding food, exposure to predators, and an increase in mortality.

Amphibians: Light pollution causes amphibians to suffer by lowering population, decrease in body weight, and confusion between insects that protect nature rather than harming it. If an ecosystem is anywhere near an urban area with high amounts of light pollution, amphibians will suffer.

Insects: You have probably seen insects fly around your porch light. This is a striking example of how artificial light affects wildlife. Insects such as moths and flies suffer a decrease in population due to light pollution because it is easier for predators to hunt the insects. The decreased insect population impacts all the animals that feed on insects as their main food source.

Birds: If any animal species suffer from light pollution, birds definitely suffer the most. Over 100 million birds in the United States die from collisions with lighted buildings alone. The lighted buildings attract them. That's not all; some migrating birds don't reach their destination because the artificial lights interfere with their navigation and can throw them off course.

Reptiles: As you may know, sea turtles travel up on beach shores to bury their eggs in the sand. But what if the beach is near a bright urban area? Baby sea turtles rely on the moon to lead them to the sea. Artificial light can lead them to roads where cars can run them over or to someplace far off until they die from exhaustion. This explains one reason why sea turtles are decreasing in population.

Light Pollution, Energy Use and the Environment

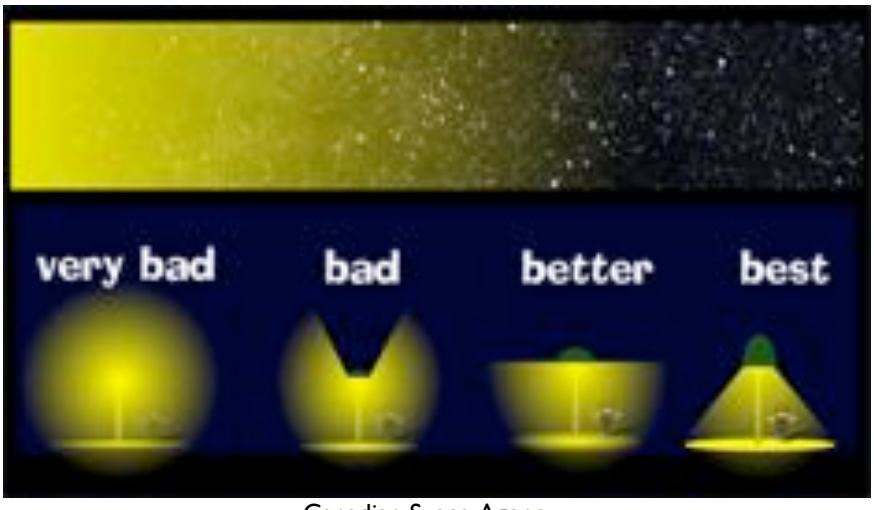
The International Dark-Sky Association estimates we waste $2.2 billion annually in the United States on unnecessary and/or inefficient outdoor lighting, amounting to 22,000 gigawatts of energy producing 14.7 million tons of carbon waste! So not only does light pollution cost the U.S. $2.2 billion on wasted lights, it is a contributor to global warming. Lights are powered by fossil fuels. This means there's carbon going into the atmosphere due to poor lighting. And lights that are kept on constantly at night to ensure "safety" not only contribute to global warming, they may not even be that helpful to keep you safe. Studies have shown that security lights have not been proven to decrease crime, and if the light is too bright, you might not even see the person trying to break into your home because of the glare.

Light pollution also enhances air pollution. In 2010, a scientist at the National Oceanic and Atmospheric Administration presented data indicating that human-caused sky-glow "reduces a naturally occurring nitrate radical that helps cleanse the atmosphere of exhaust and ozone." This study showed city lights can alter the concentration of nitrate radicals, an important atmospheric oxidant. These alterations have potential consequences for pollution levels the following day. So, a night sky full of artificial light is also a more polluted sky.

Solutions to Light Pollution

Many homeowners and city planners believe that "more is better" when it comes to lighting their night environment. But the glare of excessive light can actually reduce visibility and well-planned lighting can save money, decrease crime and improve nighttime ambiance. As taxpayers our taxes fund municipal lighting for our streets and government buildings. Let your elected officials know you do not support lighting plans that waste energy, contribute to global warming and destroy our night sky.

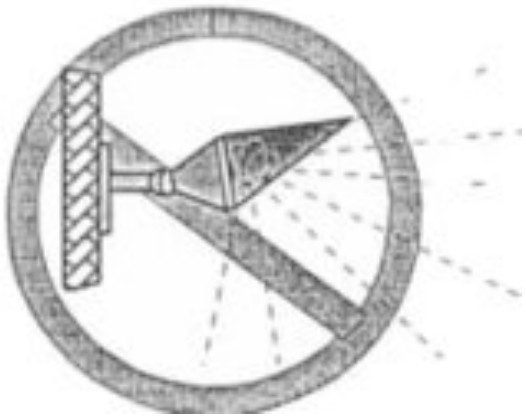
Your support for light pollution control initiatives at the city, state and federal level will also encourage the adoption of such ordinances across the country. To date, about 300 localities in the United States have adopted lighting control laws, primarily motivated by finances, but also to conserve resources, and to protect a natural resource (darkness) important to local interests such as tourism or observatories, and of course public safety.



Canadian Space Agency

Educating yourself regarding what does and does not constitute dark sky friendly lighting is a great first step. Set a good example in your own neighborhood! Changing the way people use artificial light is one simple way to solve light pollution. You only need light where you need it: ON THE GROUND. Your neighbors will appreciate your lighting choices if you consider light pollution when selecting fixtures – no more lights shining in their windows. So here are some suggestions on how to improve exterior home lighting:

When finding new light fixtures, make sure to check if they have a hood so the light is directed downwards, not up or forward. This light is fine. The hood is pointing the light downwards where it is needed.



This light is NOT GOOD. The light is pointing forwards, where it is not needed.

Images from International Dark Sky Association

To conclude, being dark sky friendly doesn't mean no light. It means using the light that you need in the most efficient manner.

- Shield and lower the wattage of all outdoor lighting—both municipal and private.
- Use only the light you need to get the job done.
- Use timers, dimmers, and sensors. Shut off the lights when you can.
- Work with your neighbors and local government to keep the light on the ground and the skies natural.
- Use light emitting diodes (LED) technology with long wave length light in a red or yellow tint to minimize impact and save energy.

References and Links

Light Pollution: Responses and Remedies, Bob Mizon, Copyright: Springer-Verlag London Limited 2002 (book)

Let there Be Night: Testimony on Behalf of the Dark, Edited by Paul Bogard, Copyright: University of Nevada press 2008 (book)

Ecological Consequences of Artificial Night Lighting, Edited by Catherine Rich and Travis Longcore, copyright: Island Press 2006 (book)

www.darksky.org, International Dark Sky Association

http://ngm.nationalgeographic.com/2008/11/light-pollution/klinkenborg-text National Geographic Magazine article on light pollution

http://www.nytimes.com/keyword/light-pollution New York Times articles on light pollution

FOR SALE
RCOS 12.5 inch f/9 Ritchey-Chretien telescope

Equipment: This is a carbon fiber solid-tube model (not truss tube) with secondary mirror focussing as well as a 2.7 inch Astro-Physics eyepiece focusser. The mirror was ground by Paul Jones of Star Instruments and shows a near-perfect test pattern. Cooling fans in the mirror mounting plate permit rapid temperature equilibration when setting up. The Telescope Control Center (TCC) utilizes 12-13 Volt DV power and is equipped with a hand paddle for focussing, fan control, and for monitoring the primary mirror temperature. Mounting is via Losmandy-type dovetail plates on top and bottom. Website picture on the RCOS website at http://www.rcopticalsystems.com/telescopes/12tube.html

History and condition: This superb scope was purchased in 2001 directly from RCOS in Flagstaff, AZ and has been kept indoors or in an enclosed observatory ever since. It was shipped back to Flagstaff for installation of the secondary mirror focussing mechanism in 2003 at which time the carbon fiber tube was repainted. The mirror has a radially oriented superficial scratch about 1 inch long. According to the mirror maker, this scratch should not have any effect on the optical performance of the scope. The external tube has one small ding in the paint but is completely intact structurally. You can see the scope on its mount at
http://www.astronomy-images.com/yours_truly_in_the_observatory.htm
and some images made with the scope by scrolling through the gallery at http://www.astronomy-images.com/images.htm.

Although the scope is completely functional, health considerations force me to sell it. A new 12.5 inch RCOS scope of this type costs $34,500 plus over $2400 for the secondary mirror focusing control (RCOS prices January 8, 2013). This excellent used scope is available for $12,500 plus shipping in the continental US from San Rafael, California; pickup in Marin County, California, preferred.

Contact me at katzung1@comcast.net

Bert Katzung
www.astronomy-images.com

NIGHT SKY NETWORK

February 2013 - THE EVENING SKY

February Sky Map: http://skymaps.com/skymaps/tesmn1302.pdf

February Sky Calendar: http://skymaps.com/articles/n1302.html

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BAY AREA ASTRONOMY EVENTS

Kenneth Lum

http://tech.groups.yahoo.com/group/bayastro/?v=1&t=directory&ch=web&pub=groups&sec=dir&slk=94

BAY AREA REGULARLY SCHEDULED EVENTS

EVERY FRIDAY NIGHT **7:00 PM – 10:00 PM** **excluding major holidays** **The Telescope Makers' Workshop** **CHABOT SPACE AND SCIENCE CENTER** **10000 Skyline Boulevard** **Oakland, CA 94619-2450**	**THE TELESCOPE MAKERS' WORKSHOP** is held every Friday night from 7pm - 10pm, excluding major holidays (e.g. Christmas Day and New Year's Day) that fall on Fridays. The Workshop is always closed on Memorial Day Weekend. Attendance every Friday night is not mandatory, and members work at their own pace. The Workshop meets at Chabot Space & Science Center, 10000 Skyline Blvd., Oakland. Contact us for more specific details: Contact: E-mail Richard Ozer (rozer@pacbell.net) or (510) 406-1914
EVERY FRIDAY & SATURDAY EVENING, weather permitting **7:30 PM – 10:30 PM** **CHABOT SPACE AND SCIENCE CENTER** **10000 Skyline Boulevard** **Oakland, CA 94619-2450** **(510) 336-7300**	**EXPLORE THE NIGHT SKIES AT THE CHABOT OBSERVATORIES** For more information: http://www.chabotspace.org/ **Free Telescope Viewing** Regular hours are every Friday & Saturday evening, weather permitting: 7:30pm -10:30pm Come for spectacular night sky viewing the best kept secret in the Bay Area and see the magnificence of our telescopes in action! **Daytime Telescope Viewing** On Saturday and Sunday afternoons come view the sun, moon, or Venus through Chabot's telescopes. Free with General Admission. (weather permitting) 12pm - 5pm: Observatories Open
Sunset – 5:11 PM **(TWICE MONTHLY)** **Inclement weather (clouds, excessive wind and showers) will cause the event to be canceled without notice.** **SAN MATEO COUNTY ASTRONOMICAL SOCIETY STAR PARTY**	**STAR PARTIES AT CRESTVIEW PARK, SAN CARLOS** Come out and bring the kids for a mind expanding look at the universe The City of San Carlos Parks and Recreation Department and the San Mateo County Astronomical Society has open Star Parties twice a month. These events are held in Crestview Park, San Carlos California. Note that inclement weather (clouds, excessive wind and showers) will cause the event to be canceled without notice. For more information call Bob Black, **(650)592-2166**, or send an email to SMCAS@live.com or call Ed Pieret at **(650)862-9602.** **Reasons to Attend** If you have kids interested in space or planets bring them here for a real life view of planets, nebula, star clusters and galaxies. If you are thinking of buying a telescope or want help using a telescope you own, come here to talk with experienced users. If you think you might have an interest in astronomy come and talk to experienced amateur astronomers. Cautions Dress warmly and wear a hat. Visitors should park on the street and walk into the park so your headlights don't affect the observer's dark adaptation. Only park in the parking lot if you are arriving before dark and plan to stay until the end of the event. You shouldn't need lights but if you feel you do, only bring a small flashlight with the lens covered using red cellophane or red balloon. Please respect the telescopes and ask permission from the owner if you wish to touch. Parents, please watch your children. The park is residential, and adjacent to homes and backyards, please keep noise to a minimum. Schedule Time Astronomers arrive to set up at around sunset. Observing starts at about one hour after sunset and continues for two to three hours.

BAY AREA EVENTS – FEBRUARY 2013

Tuesday, February 12 **12:00 NOON** **SETI INSTITUTE** **COLLOQUIUM SERIES** **189 Bernardo Ave** **Mountain View, CA 94043**	Surface exploration of small solar system bodies: challenges and prospects Marco Pavone Dept of Aeronautics and Astronautics, Stanford University In recent years, space agencies worldwide have shown an increasing interest in the exploration of small solar system bodies. Of special importance is direct access to their surfaces, as it allows precise characterization of soil properties and surface physics, and, in turn, holds the potential to lead to a much improved understanding about the origins and evolution of the solar system. Surface exploration of small bodies, however, presents daunting technological challenges. In this talk, Dr. Pavone will discuss past attempts together with recent advancements in the field of microgravity planetary rovers, including wheeled rovers, legged rovers, tethered robots, and hoppers. When tasked with operation in microgravity, these rovers must be able to function in unprecedented conditions, where traction is almost non-existent, environmental characteristics are extreme, and sharp regolith, boulders, and loose dust are dominant features of the landscape. In the final part of his talk, Dr. Pavone will focus on a reference mission to Phobos, whose aim would be to address both high-priority science objectives identified for Mars' moons and strategic knowledge gaps for future human exploration in the Martian system.
Tuesday, February 12 **4:15-5:30 PM** **STANFORD UNIVERSITY** **HEWLETT TRAINING CENTER** **Room 101** **Palo Alto CA 94305** **Cost: Free**	**A NEW TYPE OF NEUTRINO OSCILLATION OBSERVED AT DAYA BAY** Professor Yifang Wang of IHEP, Beijing, will give the Applied Physics/Physics colloquium.
Tuesday, February 12 **7:30 PM** **KEPLERS BOOKSTORE** **1010 El Camino Real** **Menlo Park, California**	This looks REALLY interesting! Apparently based on a series of courses he teaches at Stanford Continuing Studies in the evenings. **LEONARD SUSSKIND** **THE THEORETICAL MINIMUM: WHAT YOU NEED TO KNOW TO START DOING PHYSICS** In The Theoretical Minimum, physicist Leonard Susskind and hacker-scientist George Hrabovsky offer a first course and associated math for the ardent amateur. Popular physics books give readers a taste of what physicists know, but shy away from teaching the skills required to do the work. By contrast, Susskind and Hrabovsky cover the minimum--the theoretical minimum of the title--that readers need to study more advanced topics. Beginning with classical mechanics, the work ends with discussions of electromagnetic fields and chaos theory. An alternative to the go-to-college method, The Theoretical Minimum offers a tool kit for amateur scientists to learn physics at their own pace. Lenny is the Felix Bloch Professor in theoretical physics at Stanford University. He has made numerous contributions to physics and cosmology, including the discovery of string theory and the idea of a string theory "landscape." The Theoretical Minimum: What You Need to Know to Start Doing Physics (Hardcover) By Leonard Susskind, George Hrabovsky$26.99 Availability: On Our Shelves Now - Call to Confirm Published: Basic Books, 1/2013

Friday, February 15 **7:00 - 09:00 PM** **San Jose Astronomical Association** **Houge Park** **Twilight Drive** **San Jose, CA 95124** **Cost: Free**	**HOUGE PARK STAR PARTY** Meet with members of San Jose Astronomical Society for a Star Party, weather permitting.
Friday, February 15 **9:00-11:00 PM** **Foothill Community College** **12345 Moody Road** **Los Altos Hills** **Cost: Free**	**THE OBSERVATORY IS OPEN AGAIN.** Foothill Observatory is open for public viewing every clear Friday evening from 9:00 p.m. until 11:00 p.m. Visitors can view the wonders of the universe through the observatory's computer-controlled 16- inch Schmidt-Cassegrain telescope. Views of objects in our solar system may include craters and mountains on the moon, the moons and cloud-bands of Jupiter, the rings of Saturn, etc. Deep space objects including star clusters, nebulae, and distant galaxies also provide dramatic demonstrations of the vastness of the cosmos.The choice of targets for any evening's viewing depends on the season and what objects are currently in the sky. The public viewing programs at Foothill are free of charge and are open to guests of all ages. Please note that the observatory is closed when the weather is cloudy. Also note that visitor parking permits are available from the machines in the parking lots for $3.00. Come to Foothill Observatory and join us in the exploration of our Universe! Foothill Observatory is located on the campus of Foothill College in Los Altos Hills, CA. Take Highway 280 to the El Monte Rd exit. The observatory is next to parking lot 4. Parking at the college requires visitor parking permits that are available from the machines in the parking lo Addendum: The Near-Earth Asteroid 2012 DA14 will be making a very close pass earlier this day, and will be observable right after sunset Feb 15th. Normal Friday Night Public Viewing will still occur, but Rick Baldridge and other PAS Members will set a video system up on the telescope to be used from 7pm to 9pm. It is likely several NASA/Ames personnel from the Lunar Science Research Institute will be there, and likely that the media will come up to take a video feed off the telescope of the asteroid moving through the starfield. Please join us if you can. The normal Friday Night Staff should still plan on manning the observatory from 9pm to 11 as usual. It should be a fun night!
Saturday, February 16 **11:00 AM - 04:00 PM** **CHABOT SPACE AND SCIENCE CENTER** **10000 Skyline Blvd** **Oakland, CA** **Cost: Free with admission**	**INVENTION EXPERIENCE** They did it again! NASA 's newest Centennial Challenge, Night Rover and the I.S.I.S Project have joined forces with us to offer an epic, hands-on day of exploration and creationthat will have the Center jumping. In the spirit of the NASA Night Rover Challenge, Invention Experience invites students to invent, prototype, and present their own ideas. Prize drawings, giveaways, face to face with experts in the field and more. Web site: http://www.chabotspace.org/calendar.htm?date=2-16-2013&p=301723

Saturday, February 16 **10AM-12PM if it is clear** **FOOTHILL COMMUNITY COLLEGE** **12345 Moody Rd.** **Los Altos Hills, CA** **Cost: Free**	Solar observing with a Hydrogen alpha solar telescope every clear Saturday morning. This allows spectacular views of solar prominences and unusual surface features on the Sun not otherwise visible with regular white light telescopes. Foothill Observatory is located on the campus of Foothill College in Los Altos Hills, CA. Take Highway 280 to the El Monte Rd. exit. The observatory is next to parking lot 4. Parking at the college requires visitor parking permits that are available from the machines in the parking lots for $ 3.00.
Saturday, February 16 **7:00-10:00 PM** **COLLEGE OF SAN MATEO** **Building 36** **1700 W Hillsdale Road** **San Mateo, CA** **Cost: Free**	**JAZZ UNDER THE STARS** This event is weather dependent. If skies are cloudy or overcast, the event is cancelled. Latestweather updates. Visit our roof top observatory and see the moon and Jupiter thru our telescopes, while listening toKCSM Jazz 91 FM. Dress warmly and come by anytime between 7 & 10 p.m. Free parking in Marie Curie Lot 5. No food or drinks in the observatory. Children are welcome and need to be attended at all times.
Saturday, February 16 **7:30 PM** **EAST BAY ASTRONOMICAL SOCIETY** **CHABOT SPACE & SCIENCE CENTER** **1000 Skyline Boulevard** **Hauben Resource Center** **Dellums Building** **Oakland CA 94619** **Cost: Free**	**QUANTUM MECHANICS** **Speaker: Bill Levinson, PhD.**

NASA SCIENCE CAST

The Science@NASA team is pleased to announce a new product: the ScienceCast. Every week, we produce a short video highlighting a topic in NASA science news. A complete list of ScienceCast episodes may be found on Science@NASA's Youtube channel: http://www.youtube.com/user/ScienceAtNASA . Enjoy!

NASA SCIENCE NEWS
http://science.nasa.gov/science-news/

A POSSIBLE NAKED-EYE COMET IN MARCH

Feb. 6, 2013: Far beyond the orbits of Neptune and Pluto, where the sun is a pinprick of light not much brighter than other stars, a vast swarm of icy bodies circles the solar system. Astronomers call it the "Oort Cloud," and it is the source of some of history's finest comets.

One of them could be heading our way now.

A new ScienceCast video explores the possibility that Comet Pan-STARRS will be visible to the naked eye in early March. Play it!

Comet Pan-STARRS was discovered by the Panoramic Survey Telescope & Rapid Response System atop the Haleakala volcano in Hawaii. Astronomers use the massive 1.8 meter telescope to scan the heavens for Earth-approaching objects, both asteroids and comets, that might pose a danger to our planet. In June 2011 a comet appeared, and it was named "Pan-STARRS" after the acronym for the telescope.

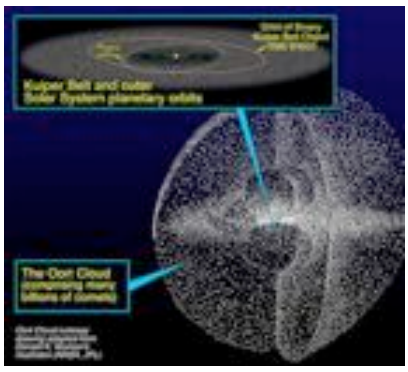
In early March, the comet will pass about 100 million miles from Earth as it briefly dips inside the orbit of Mercury. Most experts expect it to become a naked-eye object about as bright as the stars of the Big Dipper.

"But" says Karl Battams of the Naval Research Lab, "prepare to be surprised. A new comet from the Oort Cloud is always an unknown quantity equally capable of spectacular displays or dismal failures."

The Oort cloud is named after the 20th-century Dutch astronomer Jan Oort, who argued that such a cloud must exist to account for all the "fresh" comets that fall through the inner solar system. Unaltered by warmth and sunlight, the distant comets of the Oort cloud are like time capsules, harboring frozen gases and primitive, dusty material drawn from the original solar nebula 4.5 billion years ago. When these comets occasionally fall toward the sun, they bring their virgin ices with them.

Because this is Comet Pan-STARRS first visit, it has never been tested by the fierce heat and gravitational pull of the sun. "Almost anything could happen," says Battams. On one hand, the comet could fall apart--a fizzling disappointment. On the other hand, fresh veins of frozen material could open up to spew garish jets of gas and dust into the night sky.

An artist's concept of the Oort cloud. More



"Because of its small distance from the sun, Pan-STARRS should be very active, producing a lot of dust and therefore a nice dust tail," predicts Matthew Knight of the Lowell Observatory.

"However," he cautions, "it could still be difficult to see. From our point of view on Earth, the comet will be very close to the sun. This means that it is only observable in twilight when the sky is not fully dark."

The best dates to look may be March 12th and 13th when Pan-STARRS emerges in the western sunset sky not far from the crescent Moon. A comet and the Moon, together, framed by twilight-blue is a rare sight. "My guess is that the primary feature visible to the naked eye will be

the gaseous coma around the head of the comet," says Knight. "The comet's tail will probably require binoculars or a small telescope."

Two other key dates are March 5th when the comet comes closest to Earth (about 100 million miles away) and March 10th, when the comet comes closest to the sun. The dose of solar heating it receives just inside the orbit of Mercury could be just what the comet needs to push it into the realm of naked-eye visibility.

Comet Pan-STARRS should not be confused with another, even better comet coming later this year. In Nov. 2013, Comet ISON could shine as brightly as a full Moon in broad daylight when it passes through the atmosphere of the sun: video.

"Two bright comets in one year is a rare treat," says Battams. "This could be good."

Author: Dr. Tony Phillips |Production editor: Dr. Tony Phillips | Credit: Science@NASA

SEE MERCURY AT SUNSET

Feb. 8, 2013: NASA has recently discovered a very strange planet. Its days are twice as long as its years. It has a tail like a comet. It is hot enough to melt lead, yet capped by deposits of ice. And to top it all off ... it appears to be pink.

The planet is Mercury.

Of course, astronomers have known about Mercury for thousands of years, but since NASA's MESSENGER probe went into orbit around Mercury in 2011, researchers feel like they've been discovering the innermost planet all over again. One finding after another has confirmed the alien character of this speedy little world, which you can see this week with your own eyes.

A new ScienceCast video previews the year's best apparition of the planet Mercury. Play it

Mercury is emerging from the glare of the sun for a beautiful two-week apparition during the month of February 2013. The show begins about a half hour after sunset. Scan the horizon where the sun's glow is strongest and, if the sky is clear, Mercury should pop out of the twilight, a bright pink pinprick of light. Mercury itself is not actually pink, but it is often colored so by the rosy hues of the setting sun.

If you're looking on the evenings of February 8th and 9th, scan the sky around Mercury with binoculars. A second planet is there, too. Glowing faintly red, Mars is barely a degree from Mercury. In binocular optics, Mercury and Mars form a charming little double-planet.

As February unfolds, Mercury will rise higher in the sunset sky, brightening as it ascends. From February 11th through 21st, the "pink planet" will be visible for as much as an hour after sunset. February 11th is a date of special interest: a slender crescent Moon will appear straight above Mercury, providing guidance for novice sky watchers.

Mercury circles the sun about three times closer than Earth does, rotating just three times on its axis every two Mercury-years. This slow-spin under the solar inferno bakes Mercury's surface bone-dry and raises its daytime temperature to 425 degrees Celsius, hot enough to melt lead. This would seem an unlikely place to find deposits of ice, yet that is what the MESSENGER probe recently confirmed: Mercury has enough ice at its poles to encase Washington DC with a layer of frozen water two miles thick.

Mars and Mercury setting together over the Alps on Feb. 8th. Credit: Stefano De Rosa of Turin, Italy

Ice on Mercury is possible because the tilt of planet's spin axis is almost zero -- less than one degree -- so there are pockets at the planet's poles that never see sunlight. Shadowed areas at each end of the heavily-cratered planet turn out to be cold enough to freeze and hold water.

MESSENGER found something else: Much of Mercury's ice is coated with a mysterious dark substance. Researchers don't know exactly what it is, but they suspect it is a mix of complex organic compounds delivered to Mercury by the impacts of asteroids and comets.

In some ways, Mercury itself resembles a comet with a long tail. NASA's twin STEREO probes, on a mission to observe the sun, spotted Mercury's tail in 2008. The MESSENGER probe has since flown through it. The tail appears to be made of material blown off Mercury's surface by exposure to solar flares and the solar wind at point-blank range. The pressure of sunlight pushes the tail in the anti-sunward direction, just like the tail of a comet.

With the sun currently approaching the maximum of its 11-year activity cycle, Mercury is getting hit by the stormiest space weather in years. This is a great time for MESSENGER to study the processes that turn Mercury into a "comet-planet."

Mercury is a strange planet, indeed. When the sun goes down tonight, step outside and see for yourself.

Author: Dr. Tony Phillips | Production editor: Dr. Tony Phillips | Credit: Science@NASA

2013 Club Officers & Contacts

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Club Telescopes

The SFAA owns eight very fine, easy to use, loaner telescopes well-suited for deep sky, planets, and star parties. All scopes are available to any SFAA member. The loaner custodians for the majority of our fleet are Pete & Sarah Goldie. Please contact them at telescopes@sfaa-astronomy.org for details if you are interested in borrowing a scope or if you have items you can donate for the loaner program (eyepieces, star maps/books, red flashlights, collimator, etc.). Please contact the appropriate member indicated below if you are interested in borrowing one of the telescopes.

1) 6" f/10.3 Dobsonian/Ken Frank ken@sfaa-astronomy.org
2) 8" f/7 Dobsonian/Pete Goldie
3) 8.5" f/6 Dobsonian/Pete Goldie
4) 10" f/8 Dobsonian/Pete Goldie
5) 114mm f/4 Newtonian StarBlast/Pete Goldie
6) 8" f/10 Celestron SCT/Annette Gabrielli/ annette@sfaa-astronomy.org
7) 8" f/10 Meade SCT/Stefanie Ulrey/treasurer@sfaa-astronomy.org
8) 9.5" f/5.6 Celestron Newtonian/Ken Frank/ ken@sfaa-astronomy.org

Club Astronomy Videos

The SFAA owns a series of astronomy videotapes featuring Alex Filippenko, a world-renowned professor of astronomy at UC Berkeley. The videotapes provide an introduction to astronomy and cover topics such as the Solar System, the lifecycles of stars, the nature of galaxies, and the birth of the Universe. The SFAA loans the tapes free to all members. If you are interested in viewing these tapes, you may check them out at any of the SFAA General Meetings. These tapes were kindly donated to the SFAA by Bert Katzung. For information on the course tapes themselves:

http://www.teach12.com/ttc/assets/coursedescriptions/180.asp

Membership Dues

Membership is billed for each upcoming year on June 30. Members may receive no more than one bulletin after the expiration of membership.

SFAA Website and Online Services

The SFAA web site at sfaa-astronomy.org is provided to our members and the general public for the sharing of club information and services. The web site contains links for club star parties, events, newsletters, lectures and meetings. If you wish to interact with other people who are interested in astronomy, the SFAA web site offers public and members only bulletin board forums. If you wish to remain up-to-date on club activities, then we encourage you to subscribe to one or both of our public mailing lists, which will allow you to receive our newsletter and/or club announcements via email. Other useful and interesting information and services are available on the site such as observing location reviews, member astronomy photos, and members only telescope loans. Information about SFAA's membership, organization and by-laws are available at the club's online public document archive. If you need to contact a representative of the SFAA, then please visit our contacts page to help in finding the right person to answer your questions.

Above the Fog *is the official bulletin of the San Francisco Amateur Astronomers. It is the forum in which club members may share their experiences, ideas, and observations. We encourage you to participate by submitting your articles, announcements, letters, photos and drawings. We would also like to hear from our new members. Tell us about yourself – what you have done in the past and what other clubs you have joined.* ***The deadline for the next issue is the 25th day of the month****. Send your articles to* ***Editor@sfaa-astronomy.org***

MEMBERSHIP APPLICATION

Membership is billed for each upcoming year on June 30. Between January 1 and June30, new members pay one half the amount listed below

Membership Categories (Check one): _____ $10 Youth/Student _____ $40 Institutional
_____ $25 Individual _____ $75 Supporting
_____ $30 Family

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Please make checks payable to San Francisco Amateur Astronomers and mail to:

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Sharing the Wonders of the Universe

Has your membership expired? Your mailing label includes the month and year through which your membership is paid. If it is past, your membership has expired and this may be your last issue.