ABOVE THE FOG
• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

VOL. 50, No. 8 – August 2002

The 50th Anniversary Speakers Series
Women In Astronomy

The Extreme Universe of Gamma-ray Astronomy:
Exploding Stars, Blazing Galaxies and Giant Black Holes

Dr. Lynn Cominsky
Sonoma State University - Department of Physics & Astronomy and
American Astronomical Society - High Energy Astrophysics Division

August 21, 2002

Dr. Lynn Cominsky is a Professor of Physics and Astronomy at Sonoma State University (SSU). She leads the education and public outreach group at SSU, and is co-investigator for both the Swift Gamma Ray Burst Explorer and for the Gamma-ray Large Area Space Telescope (GLAST), two NASA missions that will explore the most energetic phenomena in the Universe.

Gamma-rays are created by the most violent and energetic processes in nature – including flares from super-massive black holes at the centers of galaxies, exploding stars, and gamma-rays bursts. Gamma ray bursts are among the largest known explosions in the universe, and new results hint at their mysterious origins as the birthplaces of black holes. Swift, named for its ability to rotate "swiftly" in orbit, will point at a gamma ray burst within minutes of its first appearance, and is due for launch in 2003. GLAST will watch thousands of monstrous black holes shoot out jets of particles at near light speed. Located in the cores of distant galaxies, these blazing galaxies are some of the most distant objects in the Universe.

Dr. Cominsky is also the main scientific organizer for the symposium "Particle Astrophysics and Cosmology: From Quarks to the Cosmos" at COSPAR 2002. She is a visiting scientist at the Stanford Linear Accelerator Center (SLAC) and a member of SLAC's Experimental Program Advisory Committee. She is also the Deputy Press Officer for the American Astronomical Society. In 1993, Dr. Cominsky was named both SSU Outstanding Professor and California Professor of the Year by the Council for the Advancement and Support of Education (CASE).

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Important Dates

Board Meeting – August 14 – 7:00 p.m.
-- September 11 – 7:00 p.m.
Western Addition Library, Scott & Geary Sts., SF
SFAA General Meeting – August 21
September 18
Morrison Planetarium, Golden Gate Park
Refreshments at 7:00 p.m. - Speakers begin at 7:30 p.m.

Mt. Tam Star Party
August 10 – 8:30 p.m.
September 7 – 8:00 p.m.
City Star Party
July 20 – 8:30 p.m.
August 17 – 8:00 p.m.
September 14 – 7:30 p.m.

2002 Club Officers & Contacts

President	*Bill Stepka* *(415) 928-7105*
Vice President	Nancy Cox (415) 826-2217
Secretary	Jason Burkhart
Treasurer	Chelle Owens (415) 479-5313
City Star Party Coordinator	Randy Taylor
Membership & Subscriptions	Chelle Owens (415) 479-5313
Bulletin Editor	Lorrie Boen (415) 921-1432
Telescope Loans	Pete Goldie (415) 206-9867
Honorary Director	John Dobson
Board Members	Lorrie Boen Dan Christian Art Owens Michael Portuesi Al Stern Dennis Tye Jim Webster
Alt. Board Members	Rita Nossardi Stern Randy Taylor
SFAA Website	www.sfaa-astronomy.org

Club Telescopes

The SFAA owns 3 club loaner telescopes, Dobsonian/Newtownian reflectors: 6" f/10, 8" f/7, and 10" f/8. These are available for extended periods (30 days or more) to SFAA members. These are generally very fine scopes, easy to use and well-suited for deep sky, planets, and star parties. The loaner custodians are Pete Goldie & Sarah Szczechowicz, located in San Francisco. If you are interested in borrowing a scope, or if you have items you can donate for the loaner program (eyepieces, star maps/books, collimator, etc.) please contact them via email (pg@lbin.com) or phone (415-206-9867). Email communication is preferred and strongly recommended for a quick and accurate reply.

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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 seventh day of the month**. Send your articles to Lorrie Boen at 765 Geary Street #302, San Francisco, CA 94109 or at lorrenlee@aol.com

Helen Quinn
New Developments in Particle Physics, and Their Implications for the Universe
July 17, 2002
Morrison Planetarium

"I'm a theoretical physicist with an interest in the intersection of particle physics and cosmology. I will discuss two recent discoveries in particle physics --the CP (particle-antiparticle) symmetry violation in B decays, and the fact that neutrinos have mass. I will review how these things were determined and discuss (very briefly) the cosmological implications of these results."

From Your President

We all lead busy lives and mine just got a lot more so with an appointment to another volunteer position as San Francisco Communications Lead for the American Red Cross. You may have noticed that I wear a small HAM radio on my belt at all times. Amateur Radio is the front line of communications in a major disaster and showed its worth on 9-11 in New York.

In this role we use all of the other means to communicate as well, from satellites all the way down to faxes and phone lines tied to the Internet. To coordinate a disaster relief operation requires that lots of information flow smoothly between all the people and agencies involved. It will be my job to facilitate that information flow.

Because of these additional duties I cannot possibly run again for President of the SFAA. I had not planned to do this for more than two years, so I am asking those of you with an interest, and some time, to think about running for office in our club. Think about what interests you and how you can help turn those interests into reality by participating as President or Vice President – or other positions. We need your energy and enthusiasm that I see at our meetings and star parties, to start guiding the second fifty years of the SFAA.

In other news, Bob Naeye is our new Speaker Coordinator/Program Chair. Thanks go to outgoing Chair, Rita Nossardi Stern for getting a great line up of speakers for this special year in the history of the SFAA.

After three years Lorrie Boen is retiring in November as our Bulletin Editor. Many thanks are due Lorrie for a job well done under a deadline every month. I am myself a day late in writing this, so a personal special thank you is owed by the Pres to the Editor!

Bill Stepka, Stepka@aol.com, and (415) 928-7105

Urgent: Above The Fog Bulletin Editor(s) needed starting in October. Tied to your computer anyway – edit and compile the SFFA Bulletin in between Astronomy site visits! Lorrie will guide you through the "Way of the Editor" in November as you put together the December Issue!

50th ANNIVERSARY SPEAKER SERIES
"Women in Astronomy and Related Sciences"

Morrison Planetarium
California Academy of Sciences

Wednesday September 18 – 7:00 PM
Dr. Virginia C. Gulick
NASA/Ames Research Center, Space Sciences Division

Wednesday October 16 – 7:00 PM
Dr. Debra Fischer
University of California at Berkeley, Department of Astronomy

Wednesday November 20 – 7:00 PM
Dr. Claire E. Max
Lawrence Livermore National Laboratory

San Francisco Amateur Astronomers and the
San Francisco Morrison Planetarium, California Academy of Sciences

Golden Jubilee 2002 Speaker Series

Celebrating Their 50th Anniversaries

PRESENT

Thursday September 5, 2002 at 7:30 PM
California Academy of Sciences

Timothy Ferris

Timothy Ferris, the author of twelve books among them the bestsellers The Whole Shebang and Coming of Age in the Milky Way will be our guest speaker. He is a frequent contributor to major magazines, TV shows and TV specials. He is also a consultant to NASA. Professor Ferris has taught in five disciplines at four universities, and is emeritus Professor at the University of California, Berkeley. He will be talking about his soon to be released book, Seeing in The Dark: How Backyard Stargazers Are Probing Deep Space, Charting Cosmic History, And Guarding the Earth from Interplanetary Peril.

***** Timothy Ferris' talk will be followed by a star party, telescopes provided by the members of the SFAA***

Admission is $3.00 per program - Please send a check payable to "Morrison Planetarium" indicate which talk you wish to attend and how many tickets you are purchasing and a SASE to:

Jubilee Lectures
Morrison Planetarium
California Academy of Sciences
Golden Gate Park, San Francisco, CA 94118

"The Golden Jubilee Speakers Series" is jointly presented by
the San Francisco Amateur Astronomers and
Morrison Planetarium of the California Academy of Sciences

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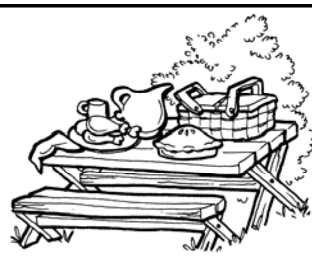
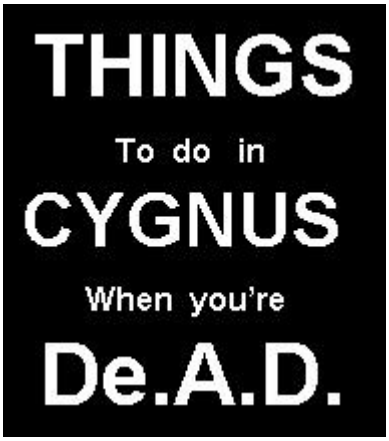
SFAA Annual Picnic



It's time to meet fellow SFAA members in daylight!

September 14, 2002
Pine Lake Park at Stern Grove
(at the east end of Laguna Puerca)
access the park by Vale off Crestlake on the south side
the BBQ area is about 100 yards west of the parking area

Hamburgers and Hot Dogs will be provided.
Any contributions of other food items will be most welcome and gratefully devoured!!!



A few years ago a movie was released called “Things to do in Denver when you’re Dead”. I must confess I’ve never seen the movie but I’ve always liked the title. I decided I should write a (perhaps monthly) article for the SFAA – and so I thought I’d steal the movie title. The “DeAD” in the title is a bit contrived but how about Dedicated Astronomical Discoverer, or my favorite Dedicated Astronomy Dude (Dudette for the ladies)!

Okay, okay – I will get on with the article.

The basic idea of the article is not to cover all the best things to view in Cygnus, although some of them are. The idea is to raise a few challenges. These challenges are not all for telescope users; some will work for binocular observers some for naked eye observers and even something for armchair observers.

I have included a map showing a location of all the objects in the article. When I say all I mean nearly all, two objects have been missed out, but more about that later.

Cygnus is the swan. Swans are majestic birds both on water in flight with their elegant long necks. The constellation Cygnus is equally elegant and really looks like a swan. In fact Cygnus is in my top three constellations for the stellar shape matching its name. Cygnus the swan flies directly in line with our galactic plane, the Milky Way. Here is the first challenge - look at the Milky Way. I mean really look at it, get into a car and drive to Lake Sonoma, Yosemite or anywhere it is so dark that the Milky Way is bright enough to ruin your night vision! Lie on the ground and just stare upward. Look at the shapes, look at all the dark patches, look at the brighter sections. This is our home. Enjoy.

The next challenge, the North American Nebula, is made more difficult by the surrounding Milky Way. The North American Nebula is a large object, about 6 times the width of the moon and is visible to the naked eye. Last Summer I spent a night at a campsite lying on a picnic table staring up at the region where the North American nebula should be – but no my week little eyes would not reveal it. I also tried looking with binoculars and a small telescope, but I failed. This year I’m determined to succeed! The brightest part of the nebula is the ‘Mexico’ region, so that would be a good starting ground for the hunt.

We live in a very colorful world, but at night, the color receiving cones in our eyes get sleepy, leaving the monochrome rods to do all the work. This results in most astronomical viewing being different shades of gray. But I love color! Stars provide an oasis in the gray night sky, providing us with a spectrum of colors if we only look. My favorite double star is Alberio, the beak of the swan, and it provides us with a gasp-worthy color contrast. Alberio is a great star party pleaser, it really gets people excited. What colors do you see? The double star of Alberio is easy to split with all telescopes and binoculars if you hold them steady. To bring out the color in stars it is often best to put them slightly out of focus – this spreads the light over a larger area for the eye to detect.

Cygnus has an interesting cataclysmic variable star, SS Cygni, which stays quiet for between 20 & 90 days and then suddenly erupts brightening 40 times. SS Cygni is a good variable star for small telescopes as it is normally around magnitude 12, near the limit of a small 3” scope, and then brightens to around 8th magnitude. The outbursts are caused by two stars closely orbiting each other, one star is a white dwarf and the other is evolving into a red giant. The outer layers of the red giant are loosely held by the stars gravity. The white dwarf is so close that some of the material originally from the red giant starts orbiting and falling onto the white dwarf. After a time (20 to 90 days) there is such a build up of material on the surface of the white dwarf that it is dense enough to start nuclear reactions – hence the large and short outburst of energy. This cycle then repeats. These reactions are known as novae – and make SS Cygni very worthwhile observing.

There is another interesting star in Cygnus. This one is for the armchair astronomers among us. Which star was the first to have its distance measured by parallax? What is the stars common name? Who successfully measured the distance to this star? What is special about this star that enabled its distance to be measured by parallax? Send me an email if you know the answers. There’s a very small prize for the first three people with the correct answers!

The last object for this month is my favorite deep sky object in a large telescope -the Veil Nebula (NGC 6960 & 6992). The Veil Nebula is two thin curved arcs of nebulosity that are the ghostly remains of a massive star going supernova. The initial supernova exploded about 30 to 40 thousand years ago, with the Veil expanding at an initial rate of 3,600,000 miles per hour. Wow, that's fast! This expansion rate has slowed down to a still sprightly 162,000 miles per hour. Photographs of the nebula show exquisite detail with wisps of cloudlike material woven together. I have view the nebula with my 80mm refractor with a Lumicon UHC filter and the curved arc shape was obvious but I could see none of the detail. At one of the Mount Tamaplias star parties I had the great pleasure to look at the Veil through Steve Overholts 20" Dobsonian. That was the most memorable observation I have ever made, the detail was incredible. I would happily have spent hours scanning up and down this great nebulae – but alas it wasn't my scope. There is a good rule for astronomers – "never observe with more aperture than you can afford". Like all rules there is a time and a place for them to be broken! So this month go and find, or make, a good friend with a larger telescope than yours and enjoy the most wonderful object in the night sky.

I hope you have enjoyed this article. I find writing difficult, so I'd greatly appreciate it if you send me an email and let me what you liked about the article. If I get some positive response I'll write some more. Lastly look at the above list of objects and try at least one, I think there's something for everyone. Clear and happy skies.

By Stuart Chalmers

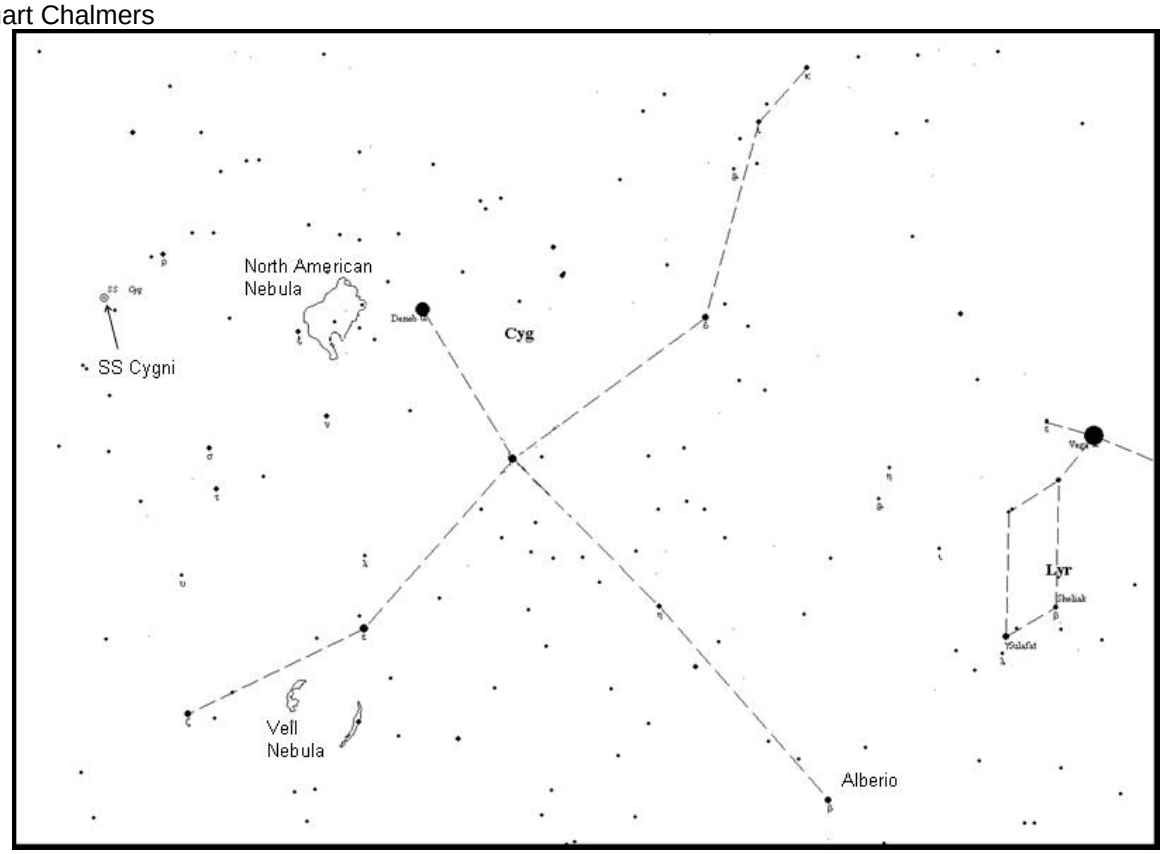


Chart of Cygnus (Stuart Chalmers, using DeepSky 2002).

WANT AD: Bulletin Editor(s) After serving as SFAA bulletin editor for three years (this October), I have decided it is time to try something else. As of the November issue, which comes out in October, I will no longer be able to perform this function. The bulletin really needs two people to publish. It is challenging, but very rewarding work. I have learned a lot about astronomy and MS Word over this time. Two would greatly reduce the burden of work and time required. If you are interested, please contact me, or one of the club officers listed on page two. I can show you how I put it together and give you the name of the printer I use, who is prompt and gives us a quality product. You can even email the bulletin to them! Or, I can just give you the files on a CD-ROM and you can take it from there.

2002 SFAA Literary Award

There are rules to everything in life, including this:

- Open to members only. You have to be in it to win it!
- The subject matter is astronomy.
- Even if you are writing in the third person, you have to have been there.
- Word limit is from zero to 1,100 words – we have only limited funds for printing.
- Please remember it is a "literary" award, so no pictures, please!
- Entries must be postmarked or in the editor's hands by September 30, 2002.
- Entries need to be in print ready format – on a 100 MB zip disk, 3.5" floppy or emailed as an attachment (not in the body of the email) - Word or Rich Text Format. All disks will be returned.
- Please mail to Lorrie Boen at 765 Geary Street #302, San Francisco, CA 94109, or email to lorrenlee@aol.com.
- Articles published in "Above the Fog" are eligible.
- All of us have had wonderful astronomical experiences, so, please, write yours down and submit it.
- All entries will be distributed to every member for judging with the November 2002 bulletin. Then, we all get to read the entries and vote. Ballots will be due by the December General Meeting, and the awards will be presented at the SFAA Annual Awards Banquet in January 2003.

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2002 MT TAM ASTRONOMY PROGRAMS

August 10 - 8:30

Dr.Diane Wooden
NASA-Ames Research Center
"Are We Stardust? Crystals,Comets and the Formation of Solar Systems"
Follow the formation of cosmic dust grains through a possible path
leading from the stars to interstellar space to our bodies.

September 7 - 8:00 pm

Dr.Gibor Basri
University of California Berkeley
"What is a Planet?"
The Pluto controversy, discovery of "free-floating planets"and brown dwarfs, and the ambiguous nature of some extrasolar "planets", have led astronomers to reconsider what we mean by the word "planet".

October 12 - 7:30 pm

Tinka Ross
California Academy of Sciences
"Astronomy is Women's Work"
Historically some extraordinary women were able to overcome societal pressures and
lack of opportunities to make significant contributions in astronomy.

Dinners with the speakers: at Mill Valley Wok, Tam Junction, 252 Almonte Boulevard, Mill Valley, 2 1/2 hours before the scheduled talk. To participate, call the restaurant at (415) 389-8868, and add your name to the "Mt Tam Party." The no-host dinner is usually $15, including tax and tip.

Information: **Telephone: (415) 455-5370, (415) 388-2070 Same day Hotlines: (415) 566-2357, (415) 455-5370 (messages after 4:00 pm)** Mailing Address: **MTIA/Astronomy Programs, P.O. Box 3318, San Rafael, CA 94912**
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Private Star Party

Newlywed couple seeks two astronomers and their telescopes to lead a star party at the couple's reception/family reunion. The reception will be held on Friday, September 28 at the California Alpine Club on 730 Panoramic Highway. Mt. Tam. The timing is flexible, what works best for you? Between 50 and 100 guests are expected. Parking, refreshments, and an honorarium will be provided. If you are interested, please contact Julie Chiron at (415) 713.3907 or juliechiron@yahoo.com.

Night Skies & Imaginary Coordinates: The Artist as Navigator
June 27, 2002- September 8, 2002

PALO ALTO - April 15, 2002-Palo Alto Art Center announces the upcoming exhibition Night Skies & Imaginary Coordinates: The Artist as Navigator, opening on June 27, 2002 and continues through September 8, 2002.

Palo Alto Art Center is located on 1313 Newell Road, Palo Alto, CA 94303 http://www.city.palo-alto.ca.us/artcenter/

Riverside Telescope Makers Conference

The SFAA was well represented in the "TM" part of RTMC (Riverside Telescope Makers Conference) at Camp Oakes near Big Bear City in May. Our own Kerry Sagar won two awards this year. One was an Honorable Mention for his 4.5-inch wood tube reflector and the title of the honorable mention award is "Innovative Tube Joinery in a First Telescope"

Kerry also won a prestigious Merit Award "For Excellent Craftmanship" for his compact 10-inch truss tube reflector. 2002 was Kerry's first year to enter the telescope competition!

He joins other notable SFAA members who have won awards in the past. Phil Alotis won a Merit Award for his wooden telescope design in 1992. Steve Overholt has won awards about 4 times including the most honored Warren Estes Award in 1999. And, John Dobson took RTMC by storm in the early '70's by bringing a large contingent of "Sidewalk" telescopes painted "flower power" colors, as described in the archives. He and Brian Rhoades won several merit awards in those early years, too.

Back to 2002, Steve Overholt was there with his array of large ultra-light telescopes, and he won an honorable mention for his newest 8-inch 'scope. There were fewer vendors, fewer telescope on the field, but about the same number of attendees and telescope competition entrants. They were just set up in the camping area to avoid the dust.

If you'd like to see and read about the RTMC events since 1969, including all the awardees from the past, check out the RTMC website here: http://www.rtmc-inc.org/

How to Calculate True Field Of View

Bob Berta

Often it is very useful to know the TRUE Field Of View of a given telescope/eyepiece combination, binoculars or that finder scope. While manufacturers may list the AFOV (Apparent FOV) or the FOV (Field of View)…often the true FOV of view is different than what they say. There are several different methods of determining the TFOV using the following methods.

It can be nice to have a simple formula that can give the amateur a rough idea of what true field of view an eyepiece will give in a telescope without the amateur having to buy the eyepiece and go out to measure things. Two such formula do indeed exist: the Apparent Field of View method, and the Eyepiece Field Stop method. The Apparent Field of View method calculates the true angular field on the sky a telescope will show using a given eyepiece by dividing the Apparent Field of View of that eyepiece (the angular span your eye sees when looking into the eyepiece) and divides it by the magnification that eyepiece gives when used in the telescope: TFOV = AFOV/Mag. For example, if an eyepiece has an apparent field of 52 degrees and yields 45x in the telescope, the true field will be approximately 1.16 degrees. This formula is only approximate, but should yield results to within 10 percent of reality if the Apparent field and power are known fairly accurately. Generally this is plenty accurate for most uses…but for those of us who have terminal cases of fussiness…the next method is more accurate.

The Eyepiece Field Stop method involves measuring the physical diameter of the Field Stop at the front of the eyepiece. The field stop is usually a ring or narrow baffle located just in front of the front "field" lens of the eyepiece. In some more complex wide-field designs, the field stop may beinside the front field lens between the elements, and in some less-expensive eyepieces, the field stop is the eyepiece barrel itself. The field for a given eyepiece is given by: TFOV = (180/Pi)*EFSD/TFL, where EFSD is the eyepiece field stop diameter and TFL is the telescope's focal length. The "180/Pi" out front is just the number of degrees in a radian (about 57.296). For example, if the eyepiece has a field stop diameter of 25.40mm (1 inch), and the telescope focal length is 1410mm, the true field of view with that eyepiece will be about 1.032 degrees. This method is considerably more accurate than the old AFOV/Mag method, although it can be occasionally difficult to do when the field stop is very small or inaccessible to easy measurement (as is the case in some complex wide-field eyepieces where the field stop is located between the elements of the eyepiece). But again if you are incurably anal about this…you need figure it out as follows.

The true field of view of any eyepiece/telescope combination can only be accurately determined by using a star field of known size, or by using the star-drift method (a better choice). In some cases where the apparent FOV is not known or lacking any other specs and whenever you want the absolute most accurate method the Star Drift Method is the one you want. To use the star-drift method, take a star of known declination and, with any drive systems turned off, time exactly how long it takes for the star to go from one field edge directly through the center of the field and over to the opposite field edge. The true field of view is then: TFOV = 15.04*T*Cos(delta), where delta is the star's declination, Cos is the Cosine function, and T is the measured drift time interval. If the time is measured in minutes, the field will be in minutes of arc, and if the time is in seconds, the field will be in seconds of arc. For example, if a star has a declination of 27.0 degrees, and a measured drift time of 2.50 minutes, the true field of view is then 33.5 arc minutes. For stars within 3 degrees of the celestial equator, the Cosine function can be approximated to 1, and the formula becomes TFOV = 15.04*T. Alternatively, a near-equatorial timing in minutes can also be divided by 3.989 to get the true field in degrees. Some useful stars for this kind of measurement are: Zeta Aquarii, Delta Ceti, 10 Tauri, Delta Orionis, Alpha Sextantis, Zeta Virginis, Nu Aquilae, etc.

Next time you see a eyepiece with 99.9 degrees AFOV you can find out just how honest the manufacturer is. And don't forget that once you get to about a 32mm plossl in a 1 ¼" barrel…you have reached the limit of the FOV of that combo. You can put a 50mm plossl in the same 1 ¼" barrel an. To get more FOV out of that combo you need to go to a 2" diagonal and NOT have anything in the focuser chain that is less than that 2" dimension.d end up with the exact same final FOV because the image is vignetted by the 1 ¼" opening

Yosemite Star Party 2002

The nights of Friday July 19th and Saturday July 20th

This is a special event for the SFAA in that everyone who goes has a wonderful time. The Moon will be near first quarter and the weather should be great. Please join us for this fun event.

The rules to apply for this SFAA function are simple.

1. This trip is **open to SFAA members, their immediate families and their significant others, only;** friends, neighbors, relatives. etc. are specifically **not** invited. SFAA is providing service in astronomy to the rangers in return for free camping facilities with guaranteed reservations. It is not meant to be a free vacation for SFAA members or non-SFAA guests.

2. Each SFAA member must bring at least one astronomical grade Telescope to operate and share with the general public on both nights. The rangers and the SFAA rules prohibit tagging along without a telescope or bringing a telescope and not participating. Binoculars will not be accepted in lieu of this one telescope requirement.

3. The total number of adults permitted in the group campsite is 30. Children 15 years and under are not counted towards the 30 maximum. Please **no pets.**

4. Cut off and return the application stub below with the correct fee to save your reservation. This on a first come - first served basis with a preference for those have contributed to the trips in the past. A basic fee of $5.00 is charged per adult (children 15 years and under are free.) The fee is not refundable. The money will go into our Yosemite General Fund. Yosemite Park fees have been waived for us during our stay.

5. Remember, camping near Glacier Point, in July, will have temperatures into the low 30's at night (3:00 AM to 5:00 AM). Prepare for this mountain environment at about 8,000 feet!! Since we can park near our tents, bring plenty of warm clothing and sleepwear, you may need it.

6. Quiet hours at Yosemite starts at 10:00 PM so we should be quiet upon returning to the campgrounds from our observing as there are other campers around us. With your cooperation this should be a fun time for all.

Cut here

SFAA member _____ telescope _____

No. of adults at $5.00 each.._____ Total amount enclosed _____

Make check payable to SFAA

Send to:

Allan Stern (Your Yosemite trip coordinator)
2021 Willow Drive
Petaluma CA 94954

Any questions?? Call Al Stern: trip coordinator at 707 769-0250.

Bay Area Calendar of Events

Date	Event	Place & Time
August		
10	Mt. Tam Star Party	Rock Springs, Mt. Tam 8:30 PM
14	SFAA Board Meeting - Members only	Western Addition Library 7:00 PM
17	City Star Party	Land's End, San Francisco 8:00 PM
21	SFAA General Meeting - Women In Astronomy Speaker Series – Dr. Lynn Cominsky, Sonoma State University, Department of Physics & Astronomy, & the Astronomical Society-High Energy Astro-physics Division	Morrison Planetarium 7:00 PM
September		
5	Golden Jubilee Speaker Series - Mr. Timothy Ferris with star party following	Morrison Planetarium 7:30 PM $3.00
7	Mt. Tam Star Party	Rock Springs, Mt. Tam 8:00 PM
11	SFAA Board Meeting - Members only	Western Addition Library 7:00 PM
14	City Star Party	Land's End, San Francisco 7:30 PM
18	SFAA General Meeting - Women In Astronomy Speaker Series – Dr. Virginia C. Gulick, NASA/Ames Research Center, Space Sciences Division	Morrison Planetarium 7:00 PM
28	ASP Annual Meeting & SFAA Star Party with David H. Levy, Comet Hunter	Rock Springs, Mt. Tam 7:30 PM
October		
9	SFAA Board Meeting - Members only	Western Addition Library 7:00 PM
12	Mt. Tam Star Party	Rock Springs, Mt. Tam 7:30 PM
16	SFAA General Meeting - Women In Astronomy Speaker Series - Dr. Debra Fischer, University of California at Berkeley, Department of Astronomy	Morrison Planetarium 7:00 PM
19	City Star Party	Land's End, San Francisco 6:30 PM
November		
13	SFAA Board Meeting - Members only	Western Addition Library 7:00 PM
20	SFAA General Meeting - Women in Astronomy Speaker Series - Dr. Claire E. Max, Lawrence Livermore National Laboratory	Morrison Planetarium 7:30 PM

San Francisco Amateur Astronomers
Membership Application

Name:_____ Telephone:_____

Address:_____

Email address:_____

Select one category:

O $10 enclosed, youth/student membership
O $25 enclosed, individual membership
O $30 enclosed, family or foreign membership
O $40 enclosed, institutional membership
O $75 enclosed, supporting membership

make checks payable to **San Francisco Amateur Astronomers** and mail to:
Treasurer, SFAA, 13 Mabry Way, San Rafael, CA 94903

Founded in September 1952, the San Francisco Amateur Astronomers (SFAA) is an association of people who share a common interest in astronomy and other related sciences. Our membership consists of people from all walks of life, educational backgrounds and ages. Many SFAA members own their own telescopes; some have been made by hand in local telescope-making classes and vary in size from 6 to 25 inches.

San Francisco Amateur Astronomers
c/ Morrison Planetarium
California Academy of Sciences
Golden Gate Park, San Francisco, CA 94118

Information Hotline: (415) 566-2357

Web Page: www.sfaa-astronomy.org

Sharing the Wonders of the Universe