

★ ABOVE THE FOG

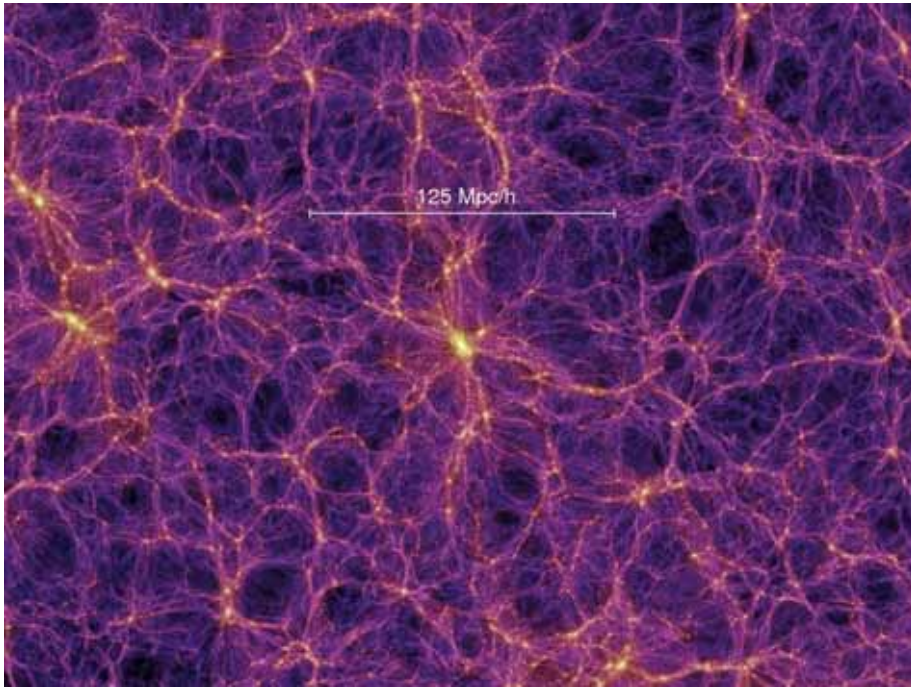
• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 55, No. 4 – April 2007

April 18, 2007 – General Meeting

7:00 pm Doors Open . 7:30 pm Announcements . 8:00 pm Speaker

DARREN CROTON – GALAXIES AND SUPER-MASSIVE BLACK HOLES IN THE NEARBY AND DISTANT UNIVERSE



I will begin by discussing galaxies and their diverse variety, our current understanding of how they form and evolve, and how they reveal the underlying cosmic structure of "dark matter" and "dark energy" that is known to dominate the universe. Using some of the largest telescopes in the world, astronomers make precision measurements of the positions and properties of galaxies, both locally (i.e. the universe at 13 billion years old, our present age) and at very large distances (i.e. the universe at an age of between 1/3 to 1/2 its present age). These measurements have lead to

unexpected discoveries and reveal a picture of galaxy evolution that is rich in detail and complexity. I will spend some time discussing one of these unexpected discoveries: the importance of active super-massive black holes that lie at the heart of every massive galaxy and the explosive effect they can have to dramatically reshape their host galaxies.

Dr. Darren Croton is a postdoctoral researcher in the Astronomy Department at UC Berkeley, and is also a member of the DEEP2 Galaxy Redshift Survey international collaboration. He obtained his PhD at the Max Planck Institute for Astrophysics in Munich, Germany, and his BSc in his home country, Australia, at the Mount Stromlo Observatory in Canberra. His work focuses on both theoretical and observational aspects of the formation and evolution of galaxies, and the large-scale Λ CDM web of dark matter in which these galaxies live.

2007 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 pg@lbin.com 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 president@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/agabrielli-sfaa@sbcglobal.net
- 7) 8" f/10 Meade SCT/Stefanie Ulrey/treasurer@sfaa-astronomy.org
- 8) 9.5" f/5.6 Celestron Newtonian/Ken Frank/kennethfrank@planitarium.net

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 20th day of the month.** Send your articles to Editor@sfaa-astronomy.org.

FOCAL POINT

Charles Messier made his apparition on Saturday, March 17th to inaugurate the Marathon. Chaz was pleased to find Rock Springs parking lot filled with energetic and happy aspirants seeking objects in the night sky that he didn't want to be known for.

The day started out warm with a blanket of fog low and off the coast. VIP training at Pan Toll ensued. Graduating VIP's now include: Alexander Adams, David Frey, and Robin Palmer. Thanks for taking the time you three! If any new members are interested, let me know and I'll arrange a training session for you.

Approaching sunset, there was a constant cool breeze, but not much of a problem until late in the evening, hastening my departure. The City light dome was bothersome, but I'll blame it on the Zodiacal Light. Peter, Michael and James were the last to leave, finishing up with M57 and M92.

Which brings me to a topic we might follow; Dave Frey has volunteered to take up my quest (with Elan's persistence) to open up the West Peak for observing. We need a concrete, lucid reason to be there and show the MMWD, (Marin Municipal Water District) that they want to give us access to the land. Here's your chance to make history. Let me know if you're interested in helping further the cause for better horizons.

Other than that, the Board has lots of things in the works. Attend our next board meeting on the second Tuesday of each month and find out what's up. We'd love your input. Above the Fog editors always welcome new (and old) articles for our newsletter at editor@sfaa-astronomy.org

Our current membership stands at 220 and growing. Even for you armchair amateurs, there are plenty of activities to keep you in tune and abreast of the SFAA's happenings; just check out the website <http://www.sfaa-astronomy.org/>

If you are up late around the 13th of April, say hello to Comet Lovejoy, C/2007 E2. It's in the southern hemisphere now, but headed our way in a lopsided orbit around the 13th of April. Let's hope for Mag 7 or better.

-- LATE BREAKING NEWS --

Vivian White has graciously volunteered for the position of Treasurer for the SFAA! Many of you may know Vivian is the Bay Area Coordinator for Project ASTRO at the Astronomical Society of the Pacific. Please welcome Vivian as our new treasurer."

Joy Spring equinox,

KEN FRANK
President

IMPORTANT DATES

SFAA GENERAL MEETINGS & LECTURES

Wednesday, April 18

Wednesday, May 16

Wednesday, June 20

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

BOARD MEETINGS

Tuesday, April 10

Tuesday, May 8

Tuesday, June 12

7:00-8:30 p.m.

*Randall Museum, 199 Museum Way
(Near 14th Street and Roosevelt)*

CITY STAR PARTIES - Telescope Clinic one hour before sunset

VOLUNTEERS ARE ALWAYS NEEDED

Saturday, April 28, 7:49 p.m. at Land's End (Point Lobos)

Saturday, May 26, 8:13 p.m. at Land's End (Point Lobos)

Saturday, June 9, 8:22 p.m. at Randall Museum

Map and directions - Land's End (Pt. Lobos) <http://www.sfaa-astronomy.org/clubarchive/directions-pointlobos.php>

Weather may cancel the City Star Party. Call the SFAA Hotline at (415) 289-6636 AFTER 4 PM to learn the status of the event and the location. If the hotline announces the Star Party is cancelled, the Telescope Clinic and Lecture are cancelled as well. However, if the Hotline does not cancel the Star Party, be assured that the Lecture will proceed as scheduled even given less-than-perfect telescope conditions.

Please also note that while City Star Parties WILL ALWAYS be held on Saturdays, some will be closer to the last quarter phase of the moon, while others will be close to first quarter. This is so we can work around dates for Mt. Tam public star parties as well as our members-only events on Mt. Tam.

MT TAM STAR PARTIES – SPECIAL USE PERMIT – MEMBERS ONLY

SATURDAYS -- April, 14, 7:37 p.m. – Gatekeeper **VOLUNTEER NEEDED**

May 19, 8:08 p.m. – Gatekeeper **VOLUNTEER NEEDED**

June 16, 8:25 p.m. – Gatekeeper **VOLUNTEER NEEDED**



NEW SFAA MEMBERS

Scope City is offering to new members a \$25 credit toward the purchase of telescopes and binoculars.

Obtain a receipt for dues payment from

Vivian White, Treasurer,

treasurer@sfaa-astronomy.org.

Contact Sam Sweiss at Scope City to arrange for your discount.

San Francisco Amateur Astronomers Lecture Series, 2007

Free & Open to the Public

7:30pm

Randall Museum Theater
Randall Museum, 199 Museum Way, S.F.

April 18

Dr. Darren Croton, U.C. Berkeley

"Galaxies & Super-Massive Black Holes in the Near & Distant Universe"

Explore the evolution of near and distant galaxies with Dr. Darren Croton, member of the international DEEP 2 Galaxy Redshift Survey. Using the world's largest telescopes, Dr. Croton's study of the measurements and positions of galaxies have led to unexpected discoveries in galaxy evolution and revealed the importance of super-massive black holes on their galactic hosts.

May 16

Dr. Azriel Goldschmidt, Lawrence Berkeley Lab

More than 100 researchers representing 26 scientific institutions from the U.S., Europe, Japan and New Zealand are working together to build "Ice Cube", an observatory designed to study high-energy neutrinos, subatomic particles with very small mass and no electrical charge that originate from supernovae, black holes, and other high energy sites in the Milky Way and beyond. Find out more with Dr. Goldschmidt, from Lawrence Berkeley Lab, one of the participating institutions.

June 20

Dr. Thomas Berger, Lockheed Martin

The latest in Solar astrophysics, including the discovery of "solar moss" on the Sun's near surface from NASA's extreme ultraviolet TRACE Spacecraft. Also a report on Japan's Hinode Solar Mission.

July 18

Dr. Kevin Zahnle, NASA Ames

"Large Impacts, Planetary Evolution and the Atmospheres of Mars and Venus-like Planets"
Check for forthcoming details.

August 22

Please check for upcoming talks at sfaa-astronomy.org

September 19

Chris Ford, Senior Designer, Pixar Animation Studios

Using hard data, amateur astronomer Chris Ford will show astronomy visualizations, aspiring to scientific accuracy that will educate and entertain. You will fly across Mars, traverse Saturn's Rings, see Jupiter up close and learn about how these spectacular simulations are done. Ford will discuss both the tools and the state of the art, and declares, "This media is where Chesley Bonestell would be working today!"

THE 2007 SFAA MESSIER MARATHON

Michael Portuesi

I hadn't done the Messier Marathon - an attempt to view all 110 Messier Objects in the same night - in some time, mostly because springtime weather in the San Francisco Bay Area has been pretty poor the past few years. But this year, almost at the last minute, I decided to do the San Francisco Amateur Astronomers Messier Marathon event at Mount Tamalpais State Park.

The Rock Springs parking lot, site of our usual star parties, was hosting this year's Marathon event. I brought my 15-inch F/5 LITEBOX Dobsonian reflector, and my partner Jim brought his Meade 8-inch SCT on a Losmandy mount equipped with an Argo Navis telescope computer. Both of us came prepared with Sky and Telescope's *Pocket Sky Atlas* for celestial navigation, as well as the February 2007 issue of *Astronomy* magazine featuring a special Messier pull-out section.

We were blessed with clear skies, and a good amount of fog covered the city, but not enough to really suppress the sky glow well. The temperature was only in the low 50's according to my thermometer. What made conditions a little sub-par was some wind, which was not enough to send everyone packing, but enough to put a chill into the air. I had bundled up with several layers and I felt fine, but some people froze up. The seeing was highly variable, one moment fairly decent, the next a total blur in the eyepiece. This dodgy seeing kept up through the entire evening.

Monsieur Messier himself delivered the address for the opening ceremonies. SFAA President Ken Frank had donned a Charles Messier outfit, including a period wig, and performed his impersonation of the great 18th century comet hunter in regal style. After the words from Messier, we were off and running.

Mount Tam isn't the ideal place for the Messier Marathon. Immediately after sunset, you miss at least seven objects at the start (M33, M31, M32, M110, M52, M76) due to the northwestern tree line. I'm not a Marathon completist, and I just ignore M77 and M74 out of principle because they are a pain to find - but they were probably lost behind the trees as well.

My first successful Messier find - M103 at 8:27 pm - began a string of uninterrupted observations every few minutes, following the classic search order established by Don Macholz. Following M103, I opened with extraordinary views of the Pleiades, the Orion Nebula, as well as the open clusters M35 and M37. At my spot in the Rock Springs parking lot, a tree to the south blocked my view to the globular cluster M79. Finally, the galaxy M83 (the Southern Pinwheel Galaxy) was lost to me in the sky glow of San Francisco to the east/southeast. (Jim found it by way of his telescope computer).

I used my much-loved 32mm Erfle eyepiece, with its wide fields, to help find objects using the *Pocket Sky Atlas* charts. We both referred to the *Astronomy* magazine pullout for photos to help confirm our finds, and Jim had the extra advantage of using the computer to locate objects. I switched to 22 and 13mm Vixen Superwide eyepieces when an exceptional celestial object demanded a closer view. But mostly I stuck with my Erfle to help speed along the chase. I would lose time swapping eyepieces in what is essentially an exercise in locating objects, moreso than carefully viewing them.

We had a break in the marathon between 11 pm and midnight. After viewing all the Marathon objects possible to that point, we had to wait for the Virgo galaxies to rise in the east. Several SFAA members departed at that point, so I simply waited as cars and trucks packed up and left the mountain. We took the opportunity to enjoy some coffee and cookies as the Virgin herself rose higher into view.

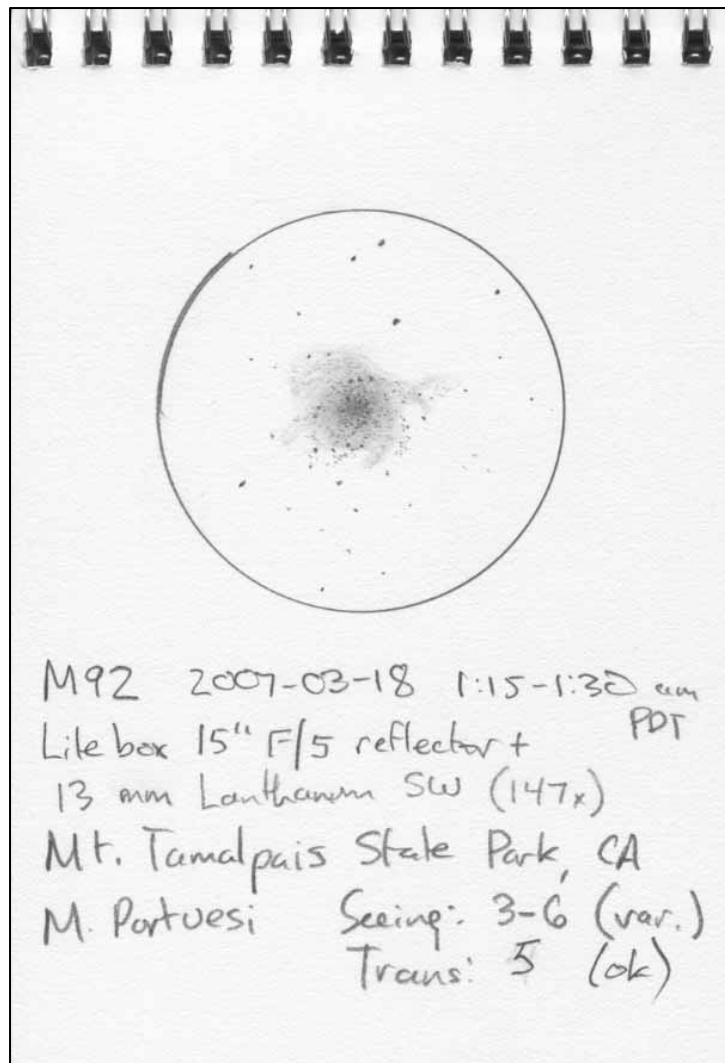
At midnight, we picked up the marathon with M98, the first of the Virgo galaxies. Using the special close-up charts of the Virgo Galaxy Cluster in the *Pocket Sky Atlas*, I methodically stepped from M-galaxy to M-galaxy within the cluster.

At 1 am, Jim and I had made it all the way up to M57 in the search order, but M57 wasn't up above the tree line yet. We had reached another break in the marathon, where you must sit and wait an hour.

Peter Schumacher and I decided we should leave at 2 am, because we didn't know if we had access to the mountain until sunrise. So we left at 2 am, and Peter cleared out the mountain shortly after. I took a little time to make a sketch of my final object - M92 - while Jim broke his telescope down. By the time I had broken down my scope and packed, it was 2 am. M57 was right at the tree line, and fog had completely enveloped the city - but the winds had picked up. It was time to go.

All told, I caught 59 M objects (including all the M's in Virgo) before retiring for the night. I think Jim got one or two more due to where his scope was situated and the fact he had a computer to assist. I found the S&T *Pocket Sky Atlas* worked well for reaching every object I tried, including the galaxies in Virgo with its special close-up charts.

Monsieur Messier, he has our sincerest thanks for the marathon, and for his tasty French pastries!



April 7, 2007 – 1:00 p.m.
SFAA TOUR
STANFORD LINEAR ACCELERATOR CENTER



Jim Webster has set up this year's tour of the [Stanford Linear Accelerator Center \(SLAC\)](#). Kids young and old need to be 12 and older. Tours generally include a lecture with an overview of particle physics research conducted at SLAC, a view of the giant detectors required to observe subatomic particles and a stroll down the Klystron Gallery, the world's longest building.

Time is 1:00 pm. Please arrive early, say 15 minutes. The tour takes about one and a half to two hours. All members attending must bring a valid picture ID, such as your driver's license and sign in.

If you haven't taken this excursion, it's a great opportunity to see real science in action. Feel free to bring your camera. According to Jim, besides the tour of the Stanford Linear Accelerator itself, there is plenty of parking and a great free art museum on campus, the Cantor museum, a terrific bookstore and probably one of the best shopping malls in the Bay Area.

The main entrance to the facility is on Sand Hill Road, just east of Interstate 280. Proceed to the Panofsky Auditorium, where our tour will begin.

Let Jim know if you're good to go by e-mailing him at Fiddleburg at aol.com with SLAC in the subject line, your name, address, including zip and phone number in the body of the email. Do it soon as we're limited to 25 members. Please don't show up without registering, as you will not be accepted for the tour. A waitlist will be used if more than 25 people sign up. See you in the Klystron Gallery!

Spring 2007 Benjamin Dean Lecture Series in Astronomy

Morrison Planetarium. California Academy of Sciences
875 Howard Street . San Francisco, CA 94103 . 415-321-8593

April 16, 2007

Dr. Peter Tuthill, University of Sydney

"FROM DUST TO DUST: THE SHROUDS OF STELLAR BIRTH AND DEATH"

May 7, 2007

Dr. Sten Odenwald, NASA Goddard Space Flight Center

"THE DAY THE SUN BLEW UP"

June 4, 2007

Dr. Paul Davies, Arizona State Universe

"COSMIC JACKPOT"

ANNUAL YOSEMITE STAR PARTY AT GLACIER POINT FRIDAY, JULY 13, AND SATURDAY, JULY 14, 2007



Panshot courtesy of Mojo

We have a New Moon weekend so our quota will fill up quickly. To sign up, please email [peter.schumacher at ucsf.edu](mailto:peter.schumacher@ucsf.edu) with "Yosemite" in the subject line, and include in the text body: your name(s), number of people, type & size of scope(s).

If you are currently registered and decide for some reason you cannot come, please let Peter know as soon as possible so others may fill your campsite. Those on the wait list will thank you for your consideration.

A note for non-members and those not making the list: Yosemite is your National Park, and you may come if you arrange your own accommodations. In this case, you would be welcome to join us at Glacier Point for the public star party and the observing afterward; however, you would not be obligated to set up for the public.

Regarding location, the Star Party will be held at Glacier Point and will be hosted by the National Park Service (NPS). For directions and guidelines, rustic camping is located at the Bridalveil Creek campground group site. There is room for several tents. Cold running water is convenient but *sans* showers. The campsite is 8.5 miles away from Glacier Point.

For those of you unfamiliar with this event, we are given free reserved admission and camping space. In exchange, we give two public star parties at Glacier Point, on Friday and Saturday night. We'll have the public (about 200 - 300 people) starting twilight and for a few hours, and then the rest of the night (and all day) to ourselves. This is a mighty good deal, considering how some folks come 12,000 miles to see these rocks. NPS limits astronomy clubs to a maximum of 30 SFAA campers. Please do not ask if your friends can come ... unless they are SFAA members. Want to join the SFAA? You are expected to have at least one public telescope for every two people. Check the National Weather Service for up-to-date weather info on Yosemite Park current weather and conditions. There is a live cam of Half Dome from Ahwahnee Meadow. Once confirmed, you will be given an Entrance Fee Waiver Form you must present to the ranger at the park entrance. These forms will

be available at our meetings. You may be asked to show the ranger your telescope when you enter the park.

The observing site is mostly open, with incredible views from about NNW to the east, around to due south. Though the horizon from south around to the west is partly blocked by tall trees, there is still a lot of open sky, and typically, the seeing and transparency are excellent. Warm temperatures of 70 to 90 prevail during the day, with cool to chilly 40's at night due to the elevation of 7200 feet.

During our Star Party, one of the rangers gives a sunset talk, and then turns the crowd over to us. A SFAA member will then deliver an evening talk. Some of the public will have white flashlights, so we need to be tolerant of that; we will have club members with red brake light tape to cover the offending flashlights.

Expect many questions from the public! Here is an object list with corresponding finder charts and some brief information.

Fun part- By around 9:30 or so, we will have the place to ourselves, and can stay until dawn. Scopes must be removed when we quit, then set up again on Saturday. Some of us may set up sun scopes during the afternoon, show Half Dome, and invite people to come again after sunset.

Gastronomic Astronomic- Early Saturday eve is traditionally potluck and is always fun. Please provide enough for ~ say 4 or 5. Salads, main course, pu pu's and desserts are all welcome. Let's try again for the best astronomical theme of incredible edibles. Prizes will be awarded! Please remember this repast takes time so it's better to start our own gastronomic party early so there's no need to rush for set up Saturday evening on Glacier Point. Sunset Saturday will be 8:23 pm.
See you there.

Peter & Ken



MT TAM ASTRONOMY PROGRAMS APRIL 21 - 8:00PM

The 2007 Mt Tam Astronomy Programs will begin on Saturday, April 21, at 8:00 p.m., with a talk by Dr. Philip Duffy, researcher at Lawrence Livermore Lab, on

**"CLIMATE CHANGE: OBSERVATIONAL EVIDENCE,
THE ROLE OF HUMANS AND SOCIETAL IMPACTS"**

Dr. Duffy will give an overview of scientific evidence for global warming and for a human role in this process, followed by a discussion of possible consequences for society. What better way to celebrate Earth Day than become more informed about our own planet and what we can do to protect it.

This is the first in a series of seven programs to be presented monthly on the Saturday evening between New and First Quarter Moon, April through October. The events are sponsored by the Mt Tamalpais State Park. Lectures are organized and run by volunteers from the Mt Tamalpais Interpretive Association and are followed by observing sessions conducted by members of the San Francisco Amateur Astronomers. The complete season can be viewed on the website: www.mttam.net

All events are FREE and OPEN TO THE GENERAL PUBLIC. Families and youth groups are encouraged to attend. Please car pool, dress warmly and bring a flashlight.

If the weather is questionable, check the website or the hotline 415-455-5370 after 4:00pm on program dates. If sky conditions prohibit observing, the lectures are usually held anyway. But occasionally rain or fire danger can close the mountain, so if in doubt check before heading up the mountain.

Thanks for your interest in the Mt Tam Astronomy Programs. See you on the Mountain!



2007 MT TAM ASTRONOMY PROGRAMS LECTURE SERIES

April 21	8:00 p.m.	Dr. Philip Duffy Lawrence Livermore Lab	"Climate Change: Observational Evidence, the Role of Humans and Societal Impacts" <i>An overview of scientific evidence for global warming and for a human role in this process, followed by a discussion of possible consequences for society.</i>
May 19	8:30 p.m.	Dr. Scott Sandford NASA-Ames Research Center	"Stardust"
June 23	8:30 p.m.	Prof. Alex Filippenko UC Berkeley	"The Birth of the Universe" <i>There is evidence in favor of a "big bang" origin for the cosmos - a hot, dense beginning with an inflationary expansion. More recent theories, however, also suggest that our universe may be only one of many.</i>
July 21	8:30 p.m.	Dr. Janice Voss NASA-Ames Research Center	"Life as an Astronaut: Highlights of STS-99" <i>Shuttle Mission STS-99 launched on Feb 11, 2000 was Dr. Voss' fifth space flight. Dr. Voss will describe the mission and other aspects of life as an astronaut.</i>
August 18	8:30 p.m.	Dr. Joseph F. Hennawi UC Berkeley	"Weighing the Dark Matter in the Universe with Gravitational Lensing" <i>A description of the mysterious problem of Dark Matter in the Universe which has confounded astronomers and physicists for nearly half a century, and recent progress on understanding it based on one of the predictions of Einstein's theory of general relativity.</i>
September 15	8:00 p.m.	John Dillon Randall Museum	"When Astronomy Became a Science" <i>An examination of the amazingly sophisticated astronomy that flowered more than 2000 years ago at the legendary Museum of Alexandria.</i>
October 13	7:30 p.m.	Dr. Steve Stahler UC Berkeley	"How Stars Are Made" <i>Stars are the natural out come of processes that occur through out galaxies. Research has led to a good understanding of the basic evolutionary process, but deep mysteries still remain.</i>

San Francisco Amateur Astronomers
POB 15097
San Francisco CA 94115

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

_____ E-Mail _____ Hard Copy

You can choose E-Mail (Recommended) or hard copy delivery for *Above the Fog* (Check one)

Information: Name(s) _____
Address _____
City _____
State _____
Home Phone _____
E-Mail _____
_____ Zip _____

_____ (+\$32.95) Sky & Telescope _____ Astronomy (+\$34.00)

Membership is billed for each upcoming year on June 30. Between January 1 and June 30, new members pay one half the amount listed below
Membership Categories (Check one):
_____ \$10 Youth/Student _____ \$40 Institutional
_____ \$25 Individual _____ \$75 Supporting
_____ \$30 Family
Magazine Subscriptions Add specified amount to membership fee for a 1-year subscription. Magazine fees remain the same regardless of the time of year you join.

MEMBERSHIP APPLICATION

San Francisco Amateur Astronomers
P.O. Box 15097
San Francisco, CA 94115



Information Hotline: (415) 289-6636

Web Page: www.sfaa-astronomy.org

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.