

★ ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 55, No. 3 – March 2007

March 21, 2007 – General Meeting

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

R. J. GaBany

Postcards From the Universe

TAKE A TOUR WITH R. JAY GABANY

ONE OF THE BAY AREA'S FINEST ASTROPHOTOGRAPHERS



Stirred By a Stellar Breeze.

For some folks, the Universe beckons later in life but, for me, I felt its gentle nudges at age 13, just before Neil Armstrong set foot on the moon. I will briefly discuss the roots of my enthusiasm, my observational experiences and how these created a map for my photographic journey to the dark places between the stars.

Cruising the Universe Without Moving

Having spent years as a visual astronomer, I will discuss the pros and cons of astroimaging today. Many of the top astrophotographers are using remote robotic imaging. How is this shaping the future of amateur astronomy? We will consider the ways that enthusiastic amateurs are becoming a valuable resource for professionals.

Mementos From the Brink of Eternity

We live in a time of stunning photos taken by amateurs. Some of these inspired me to try to produce images of the highest quality. Teaching myself and being willing to devote many hours to acquiring and processing images has led to surprising new discoveries that I will

share with you.

R Jay GaBany's interest in astronomy started at an early age, sparked by the Apollo Moon Landing program. He remembers looking at the Moon through his 60mm refractor when Neil Armstrong and Buzz Aldrin were bouncing on the lunar surface. Like gasoline on a fire, Carl Sagan's vision ignited his adult enthusiasm for astronomy when Cosmos debuted on PBS in 1980. He soon acquired his first 8" Meade SCT.

Many other telescopes followed for this enthusiastic observer as did learning how to photograph with a 35mm camera, in time for the passing of Halley's Comet in 1986. His imaging passion was rekindled after viewing the personal websites of several fine CCD astro-imagers, and he resolved to master the techniques.

GaBany moved to San Jose with his family in 1997. After contending with light polluted skies in his neighborhood, he began exposing pictures using remotely controlled instruments located under very dark skies in New Mexico and Australia. He takes long exposures over time, and spends over 100 hours processing his images. His dedication has been rewarded with spectacular views and many surprises.

He is a frequent contributor to Astronomy Magazine, Sky&Telescope and Astronomy Picture of the Day. He also writes a weekly column on the web for Universe Today.

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CI ub Tel escopes

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

CI ub 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/tc/assets/coursedescriptions/180.asp>

MEMBERSHIP DUES

The mailing label on the back of this issue shows the month and year through which your membership was paid. If the date has passed, your membership has expired. Members may receive no more than one bulletin after the expiration of membership. Please renew soon if your membership is expiring

SFAA WEBSITE AND ONLINE SERVICES



The SFAA web site at <http://www.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

Last months column started out with volunteering; well, here we go again. We are in dire need of a treasurer. The board and officers are in the process of simplifying the position to make it easier for you to do your job. At the last board meeting we decided to change all membership renewals to once a year beginning in June. Having just one date for dues sure will cut down on the paperwork. Please let me know if you'd like to be a hero of our club and accept this position.

Ok, so it wasn't the Oscar's but our Valentines Night turned out just as fun with our very own luminaries and stars for the evening fete. Elan, Robert, Peter and Linda had brought some great food, beverages and deserts to share. Linda presented her wonderful handmade awards to the winners. Most surprised must have been Bob Douglas on realizing he had won the Observation Award of a stellar Swarovski crystal. Michael Portuesi received a lovely stellar serving platter for his Triptych sketches. Nancy Cox received a beautiful meteorite pendant. Geoffrey Collins was awarded a beautiful engraved star for his incredible third time winning astrophotography imaging. Norman Mahan received a framed photo of his winning entry for his contribution to our astrophoto gallery. Renita Mock, Stacy Jo McDermott and Randy Taylor were each given a congratulatory note of thanks for their continued effort with the City Star Parties. Finally, John Dillon received the Service Award, a star inlaid Swarovski crystal, for his continuing efforts in having the Randall as our venue and for numerous other behind-the-scenes activities.

This past weekend, the weather turned foul for the City Star Party Saturn Night of observing...again. While the rain drenched the Bay Area and kept us from observing, in Japan, Yugi Nakamura and Yukio Sakurai, two independent observers discovered a nova in Scorpius. Then, about two weeks later, Yuji Nakamura and Hideo Nishimura independently discovered a second nova! If you're a sometimes early riser as I am, below Antares and currently Jupiter, you will find these two most recent discoveries. Details can be found here: www.astronomy.com/asy/default.aspx?c=a&id=5215

Volunteers are needed for VIP training for Mt. Tam for our SUP (Special Use Permit) of star parties at Rock Springs. We could always use more people to sign up for training. Samantha Toffoli <stoeff@parks.ca.gov> of the State Park Service has conveniently made Saturday, May 19th, 9:00 a.m. to 12:00 noon, at the Pan Toll Ranger Station a training date and location available for us exclusively. Please sign up with her.

If you haven't gotten your updated 2007 SUP stickers for Mt. Tam, see Jorge or Robert at one of our Rock Springs star parties. As a reminder, Messier Marathon is coming March 17th. Messr. Messier may even make an appearance to start off the event!

On March 18, there is a research project observing occultations of stars by Pluto. Dr. Franck Marchis (fmarchis@berkeley.edu) is seeking amateur astronomers to help out (and be listed as authors on any resulting paper). At the last AANC board meeting, Franck gave a talk about this project. You can view slides of his talk at http://astro.berkeley.edu/~fmarchis/document/Pluto18Mar2007/pluto_charon_occ.pdf.

As the Spring Solstice begins on our meeting night of Wednesday the 21st we will welcome the celebrated astrophotographer, R. Jay GaBany. His talk, entitled "Postcards From the Universe," will surely be worth hearing. Come early, as this meeting has been well publicized. A backup-rainout Messier Marathon date is the City Star Party on the 24th at the Randall where I'll be talking about the history of the SFAA. Do you know the history of our logo and how we're tied to the EAS?

Speaking of sign-ups, Jim Webster is looking into a SLAC tour. If you haven't taken this excursion it's a great opportunity to see science in action. According to Jim, besides the tour of the Stanford Linear Accelerator itself, <http://www.slac.stanford.edu/> there is plenty of parking and a great free art museum, the Cantor museum on campus and a terrific bookstore and probably one of the best shopping malls in the Bay area. Details and sign-up sheet to follow on the SFAA website.

This year our Yosemite dates are July 13-14, a New Moon weekend! Yosemite slots are filling up fast. Check the website for information and sign-ups.

Last night while at the EAS award dinner at Chabot, our own Cheryl Schudel was awarded the AL sunspotter award. Way to go Cheryl! Ask her how she got interested in observing our closest star.

See you in the snow, rain or whatever.

Kenneth Frank
President, SFAA

IMPORTANT DATES

SFAA GENERAL MEETINGS & LECTURES

Wednesday, March 21
Wednesday, April 18
Wednesday, May 16

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, March 13
Tuesday, April 10
Tuesday, May 8

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, March 24, 7:18 p.m. at Randall Museum
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)

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

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 -- March 17, 7:12 p.m. – Gatekeeper **VOLUNTEER NEEDED**
April, 14, 7:37 p.m. – Gatekeeper **VOLUNTEER NEEDED**
May 19, 8:08 p.m. – Gatekeeper **VOLUNTEER NEEDED**

UPCOMING SPEAKERS

APRIL GENERAL MEETING – APRIL 18

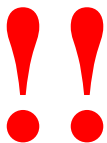
DARREN CROTON – GALAXIES AND SUPER-MASSIVE BLACK HOLES IN THE NEAR AND DISTANT UNIVERSE

Darren Croton, UC Berkeley, is a member of the International DEEP 2 Galaxy Red Shift Survey. Using the largest telescopes, the results of the measurements and positions of galaxies have led to unexpected discoveries in galaxy evolution and black holes.

MAY GENERAL MEETING – MAY 16

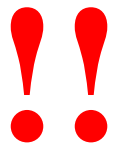
DR. AZRIEL GOLDSCHIMDT - ICECUBE PROJECT

SFAA TREASURER POSITION OPEN



**THE CLUB DESPERATELY NEEDS A TREASURER....PRONTO.
THE JOB IS BEING STREAMLINED TO MINIMIZE YOUR EFFORT.
PLEASE VOLUNTEER FOR THIS KEY POSITION IN THE CLUB.
YOUR BOARD AND MEMBERSHIP WILL SUPPORT YOU.
E-MAIL ME AT KENNETHFRANK@PLANITARIUM.NET AND I'LL LET
THE BOARD KNOW YOU ARE INTERESTED.**

KEN



Saturday, March 17, 2007

SFAA MESSIER MARATHON

Once again, we have permission to stay on Mt. Tam for the marathon!

The conditions are –

- There must be no perception of camping at the Rock Springs parking area.
- Only telescopes, equipment, stools and observing chairs are permitted on the ground. No cots or bedding. Should you need to rest, please do so in your vehicle.
- Only current dues paying SFAA members are allowed. Our Mt. Tamalpais State Park Superintendent, Laura Wong, reminded me that should this privilege be abused, our SUPs shall be revoked.
- Our point of contact for Saturday evening will be the ranger on duty. "Uncle Bob" (Robert English) and Jorge Morales are the Guys on the Mountain for the State Special Use Permit placards (placed visibly on the dash of your vehicle).
- Please arrive well before sunset so you will be ready, relaxed, set up, and not disturbing fellow M object hunters with your headlights. Charles Messier himself may even put in an appearance.

Happy Hunting!

Spring 2007 Benjamin Dean Lecture Series in Astronomy

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

March 19, 2007

Dr. Ray Jayawardhana, University of Toronto

"NEW WORLDS IN THE MAKING: ORIGINS OF PLANETS AND BROWN DWARFS"

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 University

"COSMIC JACKPOT"

COMING EVENT! - STANFORD LINEAR ACCELERATOR TOUR

Jim Webster is setting 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. April 7 is the tentative date. Time is 1:00 p.m. The tour takes about one and one-half to two hours. All individuals attending must bring a valid picture ID (i.e., driver's license) and are required to sign in. If you haven't taken this excursion, it's a great opportunity to see real science in action. According to Jim, besides the tour of the linear center itself, there is plenty of parking and a great free art museum on campus, the Cantor museum and terrific bookstore, and one of the Bay Area's best shopping malls.

SLAC's main entrance is on Sand Hill Road just east of Interstate 280. Let Jim (Fiddleburg@aol.com) know if you're good to go by e-mailing him with "SLAC" on the subject line, your name, address and phone number in the body of the e-mail. Do it soon as we're limited to 25 members. Please don't show up without registering or you will not be accepted for the tour. See you in the Klystron Gallery!

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](mailto:Peter.Schumacher@nps.gov) 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

A VISIT TO DSN (DEEP SPACE NETWORK) GOLDSTONE

Jane Houston Jones
jane.h.jones@jpl.nasa.gov

The DSN comprises three Deep Space Network (DSN) Communication Complexes. To compensate for Earth's rotation and allow 24-hour communication with distant spacecraft, the complexes are located about 120 degrees apart in longitude. The Jet Propulsion Laboratory, a division of the California Institute of Technology, manages the DSN for NASA.

The Australian complex is located 40 kilometers (25 miles) southwest of Canberra near the Tidbinbilla Nature Reserve. The Spanish complex is located 60 kilometers (37 miles) west of Madrid at Robledo de Chavela. The Goldstone complex is located on the U.S. Army's Fort Irwin Military

Reservation, approximately 72 kilometers (45 miles) northeast of Barstow, CA. Each complex is situated in semi-mountainous, bowl-shaped terrain to shield against radio frequency interference.

Recently, a group of Cassini-Huygens Mission outreach and science planning staff scheduled a visit to Goldstone. It's been on my list of things to do and places to see for a long time, so I signed up immediately.

After a two and a half hour drive from JPL, our tour began at the Goldstone museum where three large areas are dedicated to current missions, past missions, and Deep Space Network history - plus there is a hands-on activity room for children. The guided tour then travels around the 53-square-mile complex to view the large antennas.



The flags of United States, Australia and Spain, home of NASA's Deep Space Network



Goldstone entrance

Outside the administrative buildings and museum stands DSS-12 Echo, a 34-meter antenna dish named for Project Echo, an experiment that bounced signals off the surface of a balloon-type satellite. Now decommissioned, it is used by the Lewis Center for Educational Research in Apple Valley, CA. GAVRT, the Goldstone Apple Valley Radio Telescope project offers students in classrooms across America the opportunity to participate in radio astronomy through the internet.

The DSN has been the communications link to NASA's robotic spacecraft since 1958. These now legendary missions include five Surveyor landings on the moon in the 1960's; the Mariner journeys to Venus, Mars and Mercury from 1962 to 1973; the Pioneers' travels to Jupiter and Saturn in the 1970's; and the journeys of the twin Viking landers and orbiters to Mars in the mid-1970's. The DSN link was

critical to the 1977-1989 Voyagers as they sent back unforgettable images of the Jupiter, Saturn, Uranus and Neptune systems. Now the DSN supports the Voyager Interstellar Mission. Thanks to DSN, we had 14 years of returned detailed photographs and science data from Galileo, communications with Mars Pathfinder and the robots Sojourner, Spirit and Opportunity, and now Cassini data. The DSN is the vital communications pathway between Earth and our distant spacecraft.

After a museum visit and lunch in the Goldstone cafeteria, we were off to visit several of the antennae, named after their initial targets: 36-meter Echo, now used for GAVRT, twin 34-meter Gemini antennae, now supporting SOHO, 34-meter Uranus, initially used for Voyager, and now a workhorse supporting many current missions. Then we were off to Venus, a 34-meter beam waveguide antenna first used for successful radar detection of the planet Venus, and finally to DSS-14 Mars, the 70-meter antenna first used in the 1960's to track Mariner missions to Mars. It was enlarged in the 1970's to support the Voyager 2 mission to Uranus and Neptune.

On the drive from Venus to Mars we passed the Apollo site. The 26-meter Apollo antenna supported the Apollo astronaut missions to the moon. This site also houses three 34-meter beam waveguide antennas, which can be used individually or arrayed with another 34-meter antenna to obtain higher performance.

Goldstone began operating in 1958 to track the Pioneer probes that returned data about radiation around the moon. Goldstone continues to play a vital role in communication with distant spacecraft nearly 50 years later, supporting missions in the 21st century. Worth a detour? Absolutely!

Links:

- Jane and Mojo's Canberra DSN image collection <http://www.whiteoaks.com/Australia2000/pg32.html>
- Jane's Goldstone DSN images <http://www.whiteoaks.com/jane/2007Goldstone/>
- Goldstone Tours (public tours) <http://deepspace.jpl.nasa.gov/dsn/features/goldstonetours.html>
- DSN website <http://deepspace.jpl.nasa.gov/dsn/>
- GAVRT: <http://www.lewiscenter.org/gavrt/>

All photo images by the author, Jane Houston Jones



Jane standing next to the 70 meter antenna



Size comparison 70 meter antenna in the Rose Bowl

Silicon Valley Astronomy Lectures

Smithwick Theater, Foothill College
El Monte Road and Freeway 280
Los Altos Hills, California

Wednesday, March 7, 2007, 7:00 p.m.

**ASTRONAUT/SCIENTIST JANICE VOSS, NASA AMES RESEARCH CENTER
SEARCHING FOR EARTH-LIKE PLANETS: NASA'S KEPLER MISSION**

Free and open to the public. Parking on campus costs \$2.00.
Call the series hotline for more information and driving directions.
No background in science required for this talk.

So far, the 200 plus planets discovered circling other stars are all Jupiter-like planets: big and mostly made of gases and liquids. Naturally, astronomers are eager to refine their search to be able to identify smaller solid planets, resembling our own green Earth. In November 2008, NASA is scheduled to launch the Kepler mission, in search of Earth-like planets around distant stars. Dr. Voss, the Science Office Director for the project, will describe its design, as well as the expected results from the four-year mission.

Dr. Voss possesses advanced degrees in electrical engineering and aeronautics/ astronautics, and has also done research in space physics. An astronaut since 1991, she has been a mission specialist on five space flights. She has logged over 49 days in space, traveling 18.8 million miles in 779 Earth orbits.

As part of her presentation, she will also discuss her experiences as a scientist in space and her perspective on the space program. She will take questions from the audience at the end of the talk.

The lecture is co-sponsored by

*NASA Ames Research Center *The Foothill College Astronomy Program
*The SETI Institute *The Astronomical Society of the Pacific

Past Silicon Valley Astronomy Lectures are now available in MP3 format at:
<http://www.astrosociety.org/education/podcast/index.html>

Thursday, March 22, 2007, 7:00 p.m.
USGS, Conference Room A, Building 3
345 Middlefield Road, Menlo Park, California 94025

DAVID S. POWERS, GEOLOGIST & R.D. CATCHINGS, GEOPHYSICIST:
*IMPACT! PIECING TOGETHER THE STORY
OF A GIANT METEORITE CRATER BENEATH THE ATLANTIC COAST*

Buried under Chesapeake Bay is a well-preserved impact structure 56 miles across and more than two miles deep. Following clues from drill holes and seismic imagery, careful detective work in the 1990's identified this ancient buried crater. When a meteorite two miles in diameter slammed into what was then ocean, it instantly blew out a crater seven miles deep, splashed water and debris 30 miles up, and spawned tsunamis thousands of feet high. Long-mysterious glass stones ("takitites") found in the eastern U.S. and the Caribbean are now recognized as ejecta from the Chesapeake impact. After 35 million years, the landscape, drainage patterns, and underground water in the Chesapeake Bay area are still affected by the impact event.

Cost: FREE! For more information please visit: <http://online.wr.usgs.gov/calendar>

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.

Treasurer, SFAA, POB 15097, San Francisco CA 94115

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

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

Select one category:

Email address:

Address:

Name: Telephone:

San Francisco Amateur Astronomers 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.