

ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

VOL. 53, No. 10 – OCTOBER 2005

October 19, 2005 – General Meeting

RANDALL MUSEUM . 199 MUSEUM WAY . SAN FRANCISCO
7:00 PM DOORS OPEN . 7:30 PM ANNOUNCEMENTS . 8:00 PM SPEAKER

**WE ARE PRIVILEGED TO FEATURE A
SPECIAL APPEARANCE BY ONE OF THE BAY AREA'S
MOST IMPORTANT AND WELL KNOWN ASTRONOMERS**

MARK YOUR CALENDAR -- BRING A FRIEND

DR. GEOFF MARCY, Ph.D.
Professor of Astronomy
University of California - Berkeley

THE HUNT FOR HABITABLE WORLDS



Our CAL Berkeley planet-hunting team has found 107 of the known 160 planets orbiting stars. Some of these planets are scorching hot while others travel in strange, elongated orbits. Multiple-planet systems are common, reminding us of our home Solar System.

We are beginning to find planets reminiscent of Earth, with truly habitable worlds on the horizon. Planetary environments are diverse, but life may thrive despite bizarre conditions. Meanwhile, the search for intelligent life in our Galaxy has come up empty, with possible reasons beginning to emerge.

Geoff Marcy received a Bachelor of Arts double major in physics and astronomy at UCLA and graduated Summa Cum Laude in 1976. He then went on to the University of California, Santa Cruz for a PhD in Astrophysics, which he received in 1982.

He then held teaching positions, first at the Carnegie Institute of Washington as a Carnegie Fellow from 1982 to 1984, then as an associate professor of physics and astronomy from 1984 to 1996, and then as a Distinguished University Professor from 1997 to 1999, both at San Francisco State University.

Marcy lives with his wife Susan in California and currently teaches courses at UC Berkeley and San Francisco State University as an adjunct professor of physics and astronomy and a professor of astronomy respectively.

Through the Finder ...

Now that we've passed the autumnal equinox it's not too early to mark your calendars with some winter dates.

Our **annual dinner** conclave at the Basque Cultural Center in South San Francisco has been scheduled for **Saturday, January 21**. Menu choices and costs will be detailed later but mark your calendars now, reservations will be necessary. As has become customary at the annual dinner, we will be honoring the work of several members with special awards - the Observer of the Year Award and the Service Award. Observer of the Year is awarded to the club member who has reached some observing milestone within the year, while the Service Award is given for noteworthy service to SFAA or amateur astronomy in general. A third award, the Herman Fast Award, is not necessarily given every year but is reserved for someone who has shown a longtime commitment to amateur astronomy and remained actively involved in promoting it within the SFAA community. The SFAA Board will vote on these at our December meeting so if you have a deserving nominee in mind please relay names to me or any member of the Board.

Another reason to start thinking about the annual dinner - we will again display, judge, and give prizes for the best Astro-Art & Astro-Photography. So it's not too early to be polishing your Astro-Arts&Crafts. Look for more details in next month's "Above the Fog".

And, of course, there's another perennial topic connected to the end-of-the-year Calendar. A new SFAA Board is constituted each year. Here's an opportunity to help your club help you. **Nominations for Officers and Directors** will be made at the November meeting and the election will be held at the December meeting. While most members of the present Board are willing to continue, we (I include myself here) have taken on these roles because someone had to - the prospect of being an urban amateur astronomer without a support group is too bleak to consider. This Board would be happy to include, even step aside for, any member with fresh ideas and rechargeable batteries. Please seriously consider the possibility of serving on the Board, as a Director or Officer.

Nominees! We need nominees!

See you in the dark,
John Dillon, President, SFAA

Saturday, October 8, 7:30pm **2005 MT. TAM ASTRONOMY PROGRAMS** **Mountain Theater on Mt Tam**

Last July 4th NASA crash-landed a spacecraft on Comet Tempel 1. What have we learned about these cosmic snowballs from the **Deep Impact Mission**? Project Manager **Rick Grammier** from the Jet Propulsion Laboratory in Pasadena will share the latest findings at the **Mt Tam Astronomy Program at 7:30pm on Saturday, October 8, in the Mountain Theatre.**

This is the final program of the year and will be co-sponsored by The Planetary Society. The event is free and open to the general public. Weather permitting, the talk will be followed by telescope viewing in the Rock Spring Parking Lot with the San Francisco Amateur Astronomers. Students and youths are encouraged to attend.

Dress warmly and bring a flashlight. Please car pool if possible. If the weather is questionable call the hotline 415-455-5370 before heading up the mountain. *The message will be changed only if the program is cancelled.*

The 2006 Astronomical Pocket Diary, with all celestial events calculated for the Bay Area, is now available. Purchase yours at the 10/8 program, or send \$11 (includes postage and handling) to Tinka Ross, 89 Dominican Drive, San Rafael, CA 94901. Make checks payable to MTIA.

For additional information or to see the entire season of talks check our website: www.mttam.net.

Thank you for forwarding or otherwise sharing this information.

Tinka Ross

IMPORTANT UPCOMING DATES

BOARD MEETINGS

Tuesday, October 4

Tuesday, November 1

Tuesday, December 6

7:00-8:30 p.m.

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

SFAA GENERAL MEETINGS & LECTURES

Wednesday, October 19

Wednesday, November 16

Wednesday, December 21

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)

CITY STAR PARTIES

Saturday, October 22 – 6:00 p.m. – Telescope Clinic 5:00 p.m.

Saturday, November 5 – 5:00 p.m. – Telescope Clinic 4:00 p.m.

Saturday, December 10 – 5:00 p.m. – Telescope Clinic 4:00 p.m.

Land's End, San Francisco

Map and directions <http://www.sfaa-astronomy.org/sfaa/starparties/cspmap.shtml>

MOUNT TAM PUBLIC STAR PARTIES

Saturday, October 8, 7:30 p.m.

SAN FRANCISCO AMATEUR ASTRONOMER'S ROCK SPRINGS MEMBERS ONLY EVENTS (AT OR NEAR NEW MOON)

Saturday, October 29 – 7:00 p.m. (Mars Opposition)

San Francisco Amateur Astronomers Events Randall Museum, 199 Museum Way, S.F. 7:30 pm



November 16th General Meeting Guest Lecturer

CHRIS MCKAY

Going to the Moon, Going to Mars: How and Why

December 21st. Member's Night

This is a special night to begin thinking about NOW.

Plan to submit your work of Astronomy related Art, or Astronomical Photography, using any kind of camera. Consider giving a presentation at the meeting, or submit ideas for all the members to discuss. We will have a longer time for snacks and judging member's works. Be sure to attend. To give a talk, contact Linda Mahan at doublestar@comcast.net

**January 21, 2006. Annual Awards Banquet Night
BASQUE CULTURAL CENTER, SOUTH SAN FRANCISCO**

You do not need to be a potential contest winner or incoming Officer or Board Member to come and enjoy this night. Many have been attending for years, and many more members will find a night with SFAA friends, good food and drink and time to talk together -- the perfect way to begin our Astronomical Year.

If you have any comments or suggestions, contact Linda Mahan at doublestar@comcast.net Thank you.

SUMMER STAR PARTY TRAVELS

Jane Houston Jones

This has been a good summer for us, star party-wise. The Grand Canyon Star Party was grand in June. <http://www.otastro.org/2005-06-GrandCanyon/> Glacier Point in California's Yosemite National Park was breath-taking in both July and August. <http://www.otastro.org/2005-07-sfaa-yosemite/> And this past week we made our first 1,000-mile trek from Southern California to the Oregon Star Party. <http://www.oregonstarparty.org/>



Cometguys - Camped right next to us were two comet discoverers, Doug Berger (left) and Don Machholz (right).

Some meteors I noticed came from the direction of the Antheion Radiant - think anti-helion or opposite the sun direction. Unlike most of the annual showers the antihelion source is produced by debris from unknown objects orbiting in a direct motion like the earth. These objects are most likely asteroids, which produce stony and metallic debris

I haven't quite come back down to Earth yet since our return from the beautiful high desert and pristine skies of Central Oregon. Pristine, when not combined with earthly atmospheric nuisances such as rain or forest fires. Both were politely refused admittance at the OSP registration tent this year. Clouds were a minor nuisance during some parts of some nights, but didn't hinder my observing too much.

Many people commented on the great number of meteors they saw on the night of September 1 and 2. There were no major meteor showers this month. September's rates are poor in comparison to August's mighty Perseids. So what was going on?



OSPcampsite - the tent, and telescopes of the Joneses. Note the very dusty Dodge Caravan, named "Green Flash"

have been altered by Jupiter's gravity into much shorter orbits.

This material collides with the earth on the inbound portion of its orbit, before its closest approach to the sun. We see the meteors just after midnight when we are facing the direction from which this activity appears. The antihelion source is active all year from an area of the sky nearly opposite that of the sun. The meteors are actually moving slightly faster than our planet and enter the atmosphere after they have caught up to Earth. Want more information on the antihelion



Astrogeeks can't live without the internet, even in the middle of nowhere. Nomad ISP to the rescue



radiant??<http://comets.amsmeteors.org/meteors/anthelion.html>

The sporadic rates for the northern hemisphere rise toward their high plateau for the year in September. The numbers of sporadic meteors vary from season to season, due to the tilt of the Earth on its axis and other factors. As a general rule, about 2 to 3 times as many sporadic meteors can be seen in the early fall as can be seen in the early spring. So this explains the greater number of meteors this time of year - the dark skies helped, too.

On the second night, September 2 and 3 I was busy looking at objects from my current project, the Astronomical League's Observe Galaxy Groups and Clusters, while

waiting for Mars to rise higher in the morning sky. I noticed many of these faint clusters of galaxies were eluding me after a while. Was I just tired? What was going on? To the north, I noticed a light dome, except there are no earthly sources of this much pollution nearby. Then it dawned on me. I was facing north, looking towards Ursa Major and Ursa Minor. I was looking at airglow, a faint diffuse illumination of the night sky originating in the upper atmosphere.

Airglow is more subtle than an aurora. The energy in the form of visible light is derived from the sun's ultraviolet light, which ionizes atoms and dissociates molecules at heights between 40 and 200 mi (64–322 km) above the earth's surface. When the fragments collide and recombine, some atoms and molecules are left with excess energy, which they release as light. Well, that would explain it - I was seeing airglow. Suddenly I wasn't so annoyed. In fact, it was an exciting observation. It was time to look at Mars anyway.

We spent quite a bit of time observing Mars on both nights, and lots of the other attendees stopped by for a 400x look at the red planet. We had our f/9 Astro-Physics 180EDT refractor, and I think it was the only AP 7-inch refractor in a vast sea of fine telescopes of all sizes. The seeing and transparency were so outstanding on the first night that we were able to view Mars at over 800x with rock steady images near the end of astronomical twilight. The early evening was cloudy and many slept through this best of the three nights. We took a nap until 2 a.m. hoping for the skies to clear, which they did, leaving us with three perfect hours.

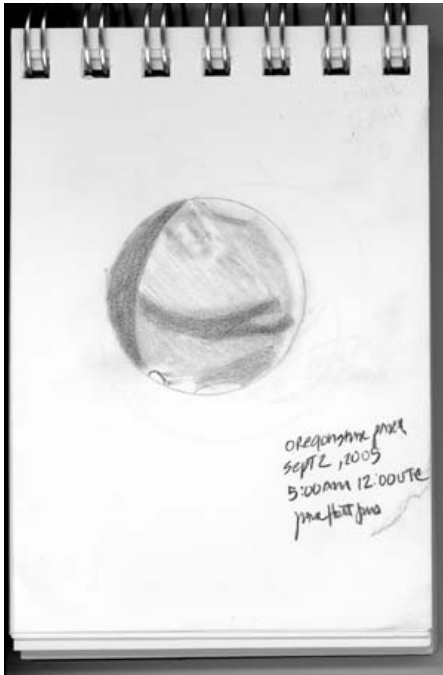
We had a few visitors who stopped for a look, and stayed with us for more than an hour each night. One of our guests sat in our comfortable observing chair, asked questions and scanned the Milky Way using my 10 x 50 Carton Alderblick binoculars, and also took a tour using the reflector, while I was sketching Mars. She spotted the beehive cluster, M44 below Saturn!

Finally near dawn, another glow appeared. A triangular glow of light extended up about 35 degrees from the horizon past Saturn and on to Mars. Sunlight bounced off grains of dust in the plane of our Solar System, starting at the horizon and lighting the ecliptic plane. The zodiacal light!

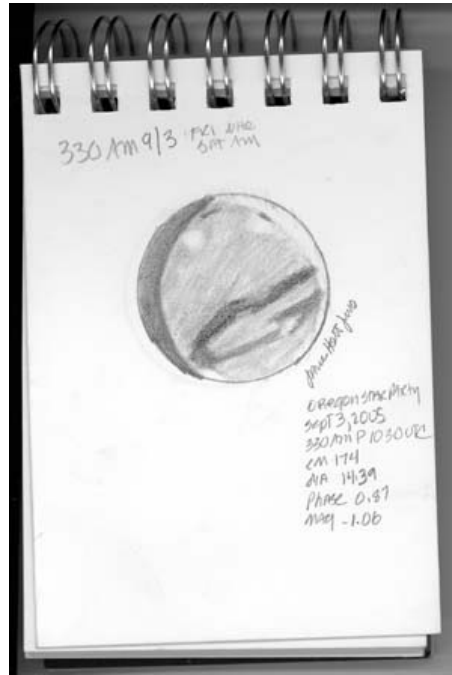
Jupiter and Venus graced the sunset sky at dusk. The zodiacal light plus Mars and Saturn welcomed the approaching dawn. What punctuation to mark a great star party experience.



Yes, Virginia, there is double soy latte, extra foam, at 3:00 a.m. Hot cocoa too!



Jane902



Jane903



mojoosp

Location: Ochoco National Forest, Oregon

Observers: Jane Houston Jones

Altitude: 5000 feet

Lat/Long: N44° 17.896', W120° 8.314'

Temperature: ranged from 60F to 45F over both nights

Humidity: 30-60%

Seeing: good 5/5 3:00 a.m. - 4:00 a.m. 9/2, softer the next night

Limiting Magnitude 7.1 before dawn 9/2/05. Varied 6.2 - 7.1

Transparency above average to good, aurora/air glow on 9/3/05 in north

Equipment: For galaxy clusters- LITEBOX reflector: 14.5 inch f/4.8 at 94 to 188X. For Mars: - 7.1-inch (180mm) f/9 Astro-Physics Starfire refractor, 6&10mm Zeiss Abbe Ortho eyepieces in 2.4x AP Barcon plus AP Baader Binoviewer 400 - 800x

Date: 9/1&2/05 9:00 p.m. until dawn and 9/2&3/05 until 3 a.m.

OSP Mars sketches: <http://www.whiteoaks.com/sketches/ospmars.html>

Jane Houston Jones

<http://www.whiteoaks.com/jane/OSP2005/>

Monrovia, CA

34.2048N 118.1732W, 637.0 feet

<http://www.whiteoaks.com>

Old Town Astronomers: <http://www.otastro.org>

Wednesday, October 5, 2005, 7:00 p.m.
Silicon Valley Astronomy Lecture Series

ASTRONOMER CYNTHIA PHILLIPS

will give a non-technical, illustrated talk on:

Jupiter's Tantalizing Moon: Water (and Life?) Under the Ice of Europa

Smithwick Theater, Foothill College

El Monte Road and Freeway 280, Los Altos Hills, California.

Free and open to the public. Parking on campus costs \$2.

Call the series hot-line at 650-949-7888 for more information.

Ever since robot spacecraft have been exploring the Jupiter system, one moon has especially captured the interest of astronomers. Although Europa's surface is cold and frozen, there is evidence that, under the ice, it has an ocean of warmer, liquid water. In her talk, Dr. Phillips will explore Europa's geology, focusing on the prospects for water and the possibilities of life in that deep alien ocean.

No background in science will be required for this talk, which will interest both fans of astronomy and the search for life.

Dr. Phillips is a Principal Investigator for a number of projects investigating Europa and Mars at the SETI Institute. She specializes in the geology of planetary surfaces and the search for life in the solar system. She worked with the Galileo spacecraft imaging team to help design observations of Europa and other moons of Jupiter. She is co-author of "The Everything Astronomy Book" and "The Everything Einstein Book," both published by Adams Media.

Co-sponsored by: NASA Ames Research Center * The Foothill College Astronomy Program
The SETI Institute * The Astronomical Society of the Pacific



350 Bay Street, San Francisco
(415) 421-8800

www.scopecity.com

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 Stephanie Ulrey, Treasurer, treasurer@sfaa-astronomy.org. Contact Sam Sweiss at Scope City to arrange for your discount.

**Saturday, November 19, 2005, 7:00 p.m.
El Campanil Theater, 602 W. Second St., Antioch**

CELESTIAL TRIPLE FEATURE

On Saturday, November 19, 2005, the El Campanil Theatre in Antioch presents a three-part astronomy evening: a film, a personal appearance by John Dobson, and telescopic viewing of the sky itself.

A Sidewalk Astronomer

A Sidewalk Astronomer is a documentary film featuring John Dobson, the one-time Vedanta monk who revolutionized amateur astronomy, whose invention, the now ubiquitous "Dobsonian" telescope, brought hands-on telescopic observing to multitudes around the world. Not one to be content with past accomplishments, the 90-year-old Dobson now devotes himself to bringing astronomy to the public by personal appearances and through the organization he founded in 1968, the "San Francisco Sidewalk Astronomers", a community-service group that has multiplied worldwide and now is simply known as the Sidewalk Astronomers. The Sidewalk-Astronomer movement now has brought telescopic vistas to the

eyes of millions at locations ranging from light-polluted urban street corners to the dark skies of isolated national parks.

Produced and directed by Jeffrey Fox Jacobs, this 78-minute independent film will have its first East Bay showing at 7:00 PM on Saturday night, November 19, 2005, at the historic El Campanil theatre in downtown Antioch.

John Dobson In Person

Immediately following the showing of A Sidewalk Astronomer, John Dobson will appear personally on the theatre's stage, describing his life and his multifaceted interests and activities, and to answer questions from, and interact with, the audience. You can expect entertainment and enlightenment; the New York Times review of his film described John as "spreading his gospel of curiosity about the stars" and having "a gift for explaining scientific concepts in the form of wry one-liners."

Telescopic Skygazing

Continuing the evening's theme, at about 9:30 PM, just after the film showing and John's appearance, you can move

outdoors to a site by the theatre to enjoy telescopic viewing of the heavens yourself. One target will be the planet Mars, now high in our sky and particularly close to the Earth; when viewed with a 100-power telescope it will appear as large as the Full Moon. As a matter of fact, the rugged face of the Moon itself, four days past full, will be rising in the eastern sky. And there will be plenty of farther objects to be viewed: double stars, clusters of stars and even galaxies. (This portion of the evening will of course be dependent on the weather.)

The telescopes you will look through are kindly provided by members of the Mount Diablo Astronomical Society. If you are turned on to astronomy, remember that a similar group of amateur astronomers is likely to be near you.

The El Campanil Theatre

On November 1, 1928, the El Campanil Theatre opened in the city of Antioch. With its Spanish Colonial/Gothic style, at the time it was called "the most pretentious building in Contra Costa County." Featuring both movies and vaudeville, the theatre closed to the public in the 1950s. However, the El Campanil Theatre Preservation Foundation was formed in 2001, and purchased the theatre in 2003, converting the building to a 700-seat community performing-arts venue, restoring and preserving the original exterior and interior design.

The El Campanil is located in the historic Rivertown Business District of Antioch, at 602 W. Second Street. To reach the theatre take State Highway 4 to the "A" Street exit in Antioch, then turn off (left if you're going east, right if you are headed west). Follow "A" Street north toward the San Joaquin River. Once you pass Wilbur Avenue "A" Street curves to the left along the waterfront and turns into Second Street, now heading west. The El Campanil is located at the corner of Second and "G" Streets. Public parking is located a few yards past the theatre, with lots on both the right and left sides of Second Street.

You may purchase tickets next to the theatre, at 604 W. Second Street, starting at 6 PM. Tickets are \$5.00 per person, and \$4.00 for seniors (over 62).

***Interested in an RASC 2006 Handbook or Calendar?
If you haven't already ordered, please let Ken Frank know by Friday.
We'll order thru SJAA for a good price break.***

John Dobson commemorative pins are available from Ken as well.

CITY STAR PARTY LECTURES

Land's End, San Francisco

Map and directions <http://www.sfaa-astronomy.org/sfaa/starparties/cspmap.shtml>

Michael Portuesi, the genie of the Hotline, will make a determination by 4:00 p.m. as to whether the weather permits the Star Party to go forward. If the Star Party is cancelled, the whole event is off.

- Unless you can tell from your sidewalk that it is clear at Land's End, you should phone the Hotline: (415) 289-6636.
- If the Hotline says the Star Party is cancelled, then don't bother going to Land's End for the lecture even if the sky has miraculously turned clear as glass. (But hey, if you want to bring your telescope and just unofficially hang out, you might get great views.)
- If the Hotline says the event is happening, but you can see perfectly well that the fog has rolled in, come on by anyway and hear one of your fellow SFAA members give a nice lecture. Please look over the following lineup of topics and speakers listed.

When: October 22, 2005 at 6:00pm
Subject: Mars: Then and Now
Speaker: Michael Portuesi
SFAA Board member and past President

Long before Viking, Mars Pathfinder, and the Spirit/Opportunity rovers, 19th-century observers Giovanni Schiaparelli and Percival Lowell studied Mars using the state-of-the-art telescopes of their era. Their discoveries dominated our knowledge of Mars right up until the Space Age in the 1960's.

We'll touch upon the connection between those astronomers of old and today's amateur astronomers. We'll also look at today's Mars as revealed by NASA and European space missions.

Here are a few things you might not know about our past President, Michael Portuesi. He edits the San Francisco Sidewalk Astronomers website. He holds Astronomical League observing certificates for deep-sky and solar observing and is pursuing several more. He has published articles in Night Sky magazine and other publications, and appeared on national television for TechTV. His past SFAA talks have covered the lives of stars, the Moon, the Sun, viewing nebulas, handheld computers for astronomy, and telescope basics. See his websites at <http://astro.jotabout.com> and at <http://www.sfsidewalkastronomers.org>.

When: November 05, 2005 at 5:00pm
Subject: Myths around the Ecliptic
Speaker: Jennifer Myers, SFAA Secretary

The Ecliptic has been recognized for millennia as the path along which we see Sun, Moon, and "wandering stars" travel. Although we now know that it is actually the plane in which planets orbit the Sun, we have inherited from the ancients a wealth of mythical lore surrounding the importance of this part of the heavens, divided as it is into the twelve constellations of the Zodiac. The stories, some of which have survived from the time of the Chaldeans and Sumerians, reveal not only something of the philosophy of the cultures that created them, but also an intimacy with the night sky that was part of everyday life in the earliest history of human sentience.



Motley Few

Jennifer Myers considers herself a very junior member of the SFAA, in spite of which she currently serves as its Secretary. As a child growing up in San Francisco, she recognized exactly one "constellation" (guess which one), so learning about astronomy these days is a source of perpetual revelation. Apart from astronomy, she also enjoys bird watching, walking, making stained glass windows, and travel, among many other things.

When: December 10, 2005 at 5:00 p.m.
Subject: Winter Constellations
Speaker: Kenneth Frank, SFAA Board of Directors

Weather permitting, this is a great night for an overview (well, depending on your perspective) of the winter sky.

Kenneth Frank became absorbed in astronomy when his son, Aeddán, was first interested in Star Wars. Ken wanted Aeddán to be involved with something more practical than a sci-fi movie series.

What evolved was Kenneth's growing passion for understanding the night sky and bringing that interest to the public in the form of outreach. Kenneth is a member of the NASA/JPL Saturn Observation Campaign giving children the unique opportunity to explore the wonders of our neighboring planets. He is an active SFAA Board member, and we owe him a lot for his work with the

State Park service on Mt. Tam to provide and preserve the public access to the night sky. He is currently the Vice President of the AANC, the Northern California umbrella agency "club of clubs" for the amateur astronomer community; he assists John Dobson with telescope making classes starting this fall at the Randall Museum in San Francisco and Sidewalk Astronomy frequently in the Bay Area. Kenneth happily lives in Tiburon with his wife, Jayni Allsep son Aeddán Frank and is a consultant for Scope City in San Francisco.



Is this where I get the coffee?



Wednesday, October 5, 2005, 7:00 p.m.
Silicon Valley Astronomy Lecture Series
Astronomer Cynthia Phillips
JUPITER'S TANTALIZING MOON:
WATER (AND LIFE?) UNDER THE ICE OF EUROPA

Non-technical, illustrated talk
Smithwick Theater, Foothill College
El Monte Road and Freeway 280, Los Altos Hills, California

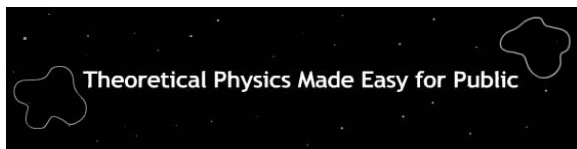
Ever since robot spacecraft have been exploring the Jupiter system, one moon has especially captured the interest of astronomers. Although Europa's surface is cold and frozen, there is evidence that, under the ice, it has an ocean of warmer, liquid water. In her talk, Dr. Phillips will explore Europa's geology, focusing on the prospects for water and the possibilities of life in that deep alien ocean.

No background in science will be required for this talk, which will interest both fans of astronomy and the search for life.

Dr. Phillips is a Principal Investigator for a number of projects investigating Europa and Mars at the SETI Institute. She specializes in the geology of planetary surfaces and the search for life in the solar system. She worked with the Galileo spacecraft imaging team to help design observations of Europa and other moons of Jupiter. She is co-author of "The Everything Astronomy Book" and "The Everything Einstein Book," both published by Adams Media.

Free and open to the public. Parking on campus costs \$2. Call the series hot-line at 650-949-7888 for more information.

Co-sponsored by: * NASA Ames Research Center * The Foothill College Astronomy Program
* The SETI Institute * The Astronomical Society of the Pacific



Saturday, November 5, 2005 - 1:00 p.m. - 5:00 p.m.
Multiversal Journeys Current Events
Latest Theories about the Universe & Its Governing Laws
<http://www.multiversaljourneys.com/images/Brochure-Cover.jpg>
<http://www.multiversaljourneys.com/images/Brochure-Inside.jpg>

Topic: The World as a Hologram

Speaker: Professor Raphael Bousso - University of California, Berkeley

Raphael Bousso is a professor of physics at University of California, Berkeley. He received his Ph.D. from Cambridge University and went on to become a Post-doc at Stanford University. He also worked at the Kavli Institute for theoretical Physics in Santa Barbara, and he was a fellow at the Harvard University physics department and the Radcliffe Institute for Advanced Study. Professor Bousso is a leading expert on quantum gravity, cosmology, and string theory. He discovered a general formulation of the holographic principle, telling us, among other things, just how much information there is in the universe. He also proposed, with J. Polchinski, an explanation of the mysterious accelerated expansion of the universe that has recently been observed. He and Polchinski showed that string theory predicts a multiverse containing regions with the right amount of the required dark energy.

Topic: Finding a Home in the Multiverse

Speaker: Professor Anthony Aguirre - University of California, Santa Cruz

Anthony Aguirre is a professor of physics at UC Santa Cruz. He received his Ph.D. from Harvard University. He spent three years as a member of astrophysics group at the Institute for Advanced Study in Princeton. Professor Aguirre has worked in a wide variety of topics in theoretical cosmology, ranging from intergalactic dust to galaxy formation to gravity physics to the large-scale structure of inflationary universes and the arrow of time.

Topic: Extra Dimensions

Speaker: Professor John Terning - University of California, Davis

John Terning is Professor of Physics at University of California, Davis. He received his Ph.D. from University of Toronto and was a Postdoctoral Fellow at Yale University. He was also a researcher at Boston University, University of California, Berkeley and Harvard University. Professor Terning is a staff member at the Los Alamos National Laboratory. John Terning's research interests include theoretical particle physics, electroweak symmetry breaking, supersymmetry, cosmology, extra dimensions, and AdS/CFT correspondence.

Location: Lawrence Hall of Science, UC Berkeley

Directions: <http://www.lawrencehalloffscience.org/generalinfo/directions.html>

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.