

# ★ ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

VOL. 53, No. 3 – MARCH 2005

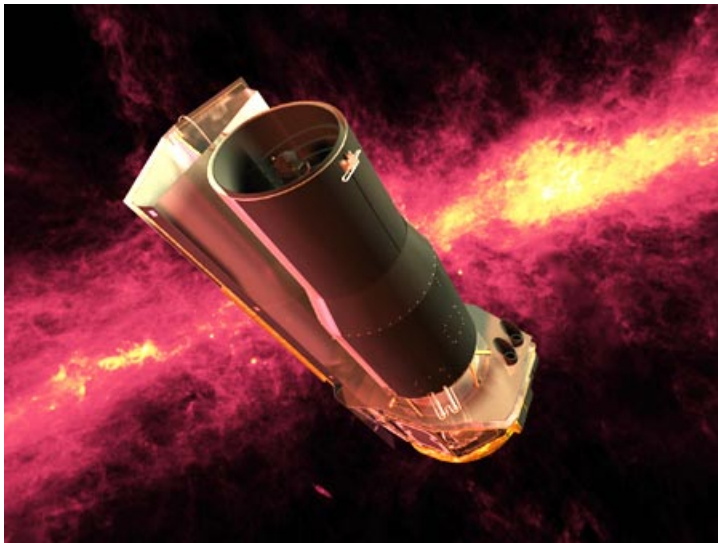
## FEBRUARY 16, 2005 – GENERAL MEETING

RANDALL MUSEUM  
199 MUSEUM WAY  
SAN FRANCISCO

7:00 PM DOORS OPEN  
7:30 PM ANNOUNCEMENTS  
8:00 PM SPEAKER

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### Rick Maxwell Spitzer Space Telescope Presentation



A year and a half ago, NASA launched the Spitzer Space Telescope, the last of the four Great Observatories. During this time, Spitzer's super-sensitive infrared instruments have presented unparalleled views of the nature of our universe.

Brown dwarves, planets, interstellar dust and gas, and protoplanetary discs are too cool to emit visible light but are detectable in the infrared spectrum. Spitzer's ability to see through dusty nebulae reveals objects hidden in their centers. The sensitive cameras aboard Spitzer take advantage of a special characteristic of light known as "red shift" allowing us to look billions of years into the past to add to our understanding of the early universe.

Rick will be speaking on a variety of Spitzer topics. Its mission, the science and engineering involved in the development of the spacecraft, an insider's view of the launch and day-to-day operations, and some of the intriguing science that we are receiving.

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*Rick is a Senior Systems Engineer for Lockheed Martin Space Systems Company. In his career at Lockheed and his association with NASA and the Jet Propulsion Laboratories, Rick has worked on a variety of space systems including deep-space exploratory missions, planetary missions, and orbiting observatories. He graduated from the Air Force Academy in 1979 with a degree in Computer Science.*

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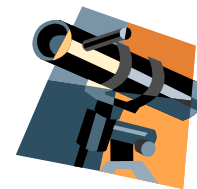
## MEMBERSHIP DUES

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.

## CLUB TELESCOPES

The SFAA owns 4 club loaner telescopes, Dobsonian/Newtonian reflectors: 6" f/10, 8" f/7, and 10" f/8 and a Starblast. They 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 (<mailto: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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## 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. Our librarian is Dan Christian.



For information on the course tapes themselves:

<http://www.teach12.com/tc/assets/courseDescriptions/180.asp>

## ONLINE SERVICES FOR SFAA MEMBERS



The SFAA's Secretary's Web Site helps keep SFAA information together and accessible to members. The site URL is <http://www.whiteoaks.com/sfaa/>. At this site you can find such information as minutes from meetings of the Board of Directors, the SFAA official by-laws, and other information. SFAA also offers email lists to supplement the bulletin board offered at the SFAA's official web site. At present there are two email lists – an unmoderated list for use primarily for business and discussion by the Board of Directors (but open to all members), and a moderated announcement list for all SFAA members. If you would like to be added to the SFAA-announce email list, please contact the secretary (<mailto:secretary@sfaa-astronomy.org>) and let him know. You can also sign up for the list yourself at this URL: <http://www.whiteoaks.com/mailman/listinfo/sfaa-announce>

*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 Phil Estrin at [pestrin@dir.ca.gov](mailto:pestrin@dir.ca.gov).

## THROUGH THE VIEWFINDER

Just prior to the autumnal equinox, SFAA members (and other Bay Area amateurs) will have several big events to put on their calendars. On Saturday, August 27, the Astronomical Association of Northern California (AANC), the umbrella group of Northern California amateur astronomers, will hold an all-day conference at the Randall Museum. Two weeks later, September 8 - 12, Camp Mather, the San Francisco Recreation and Park Department's great cabin camp next door to Yosemite, will extend its normal summer operations to allow amateur astronomers to transport their scopes and families upcountry for a long weekend of dark skies (and a little moonlight) plus some High Sierra diurnal frolicking. The SFAA annual BBQ and a 90th Birthday Party for our astro-mentor, John Dobson, will round out a memorable September. Details on all these events will be forthcoming -- but you should be planning now to reserve space at Camp Mather.

Mather reservations are difficult to get for regular summer dates. This new post-Labor Day schedule may also be very popular. To maximize your chances, get your reservations in by the March 11 deadline for their lottery drawing. After that it's first-come, first-served. The registration forms can be downloaded from the Camp Mather web site at: [http://www.parks.sfgov.org/site/recpark\\_page.asp?id=16322](http://www.parks.sfgov.org/site/recpark_page.asp?id=16322)

To expedite processing, write "FALL" on the lower left corner of the envelope.

See you in the dark.



**JOHN DILLON  
PRESIDENT  
SAN FRANCISCO AMATEUR ASTRONOMERS**

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## IMPORTANT UPCOMING DATES

### BOARD MEETING

**MARCH 9  
APRIL 13  
MAY 3**

**7:00-8:30 P.M.**

*Randall Museum, 199 Museum Way  
(Near 14<sup>th</sup> Street and Roosevelt)*

### SFAA GENERAL MEETING & LECTURE

**MARCH 16  
APRIL 20  
MAY 18**

**7:00 P.M. DOORS OPEN  
7:30 P.M. ANNOUNCEMENTS  
8:00 P.M. SPEAKER**

*Randall Museum, 199 Museum Way  
(Near 14<sup>th</sup> Street and Roosevelt)*

### CITY STAR PARTY

**MARCH 19 – 6:00 P.M., - TELESCOPE CLINIC 5:00 P.M.**

*Land's End  
San Francisco*

### MOUNT TAM PUBLIC STAR PARTY

**APRIL 16 – 5:30 P.M. - TELESCOPE CLINIC 4:30 P.M.**

**SAN FRANCISCO AMATEUR ASTRONOMERS  
ANNUAL AWARDS DINNER  
JANUARY 22, 2004**



**LIFE MEMBER AWARD  
STEVE GOTTLIEB**

**ART AWARDS**

**1<sup>ST</sup> PLACE - CARL TROST  
ARMILLARY SPHERE**

**2<sup>ND</sup> PLACE - MICHAEL PORTUESI  
LUNAR CRATER SKETCH**

**3<sup>RD</sup> PLACE - CHERYL SCHUDEL  
PEAK TRAFFIC IN NGC 10,000**

**ASTROPHOTOGRAPHY AWARDS**

**1<sup>ST</sup> PLACE - GEOFFREY COLLINS  
NEBULA AND GALAXY PHOTOGRAPHS**

**2<sup>ND</sup> PLACE - BOB BERTA  
SOLAR TRIPTYCH**

**3<sup>RD</sup> PLACE - KEVIN HARTZOG  
LUNAR PHASE PHOTOGRAPHS**



**SERVICE AWARD  
OBSERVER OF THE YEAR AWARD  
SECOND PLACE ART AWARD  
MICHAEL PORTUESI**



**AWARDS WERE BEAUTIFULLY  
CRAFTED BY LINDA MAHAN**

# OBSERVING AT JOSHUA TREE NATIONAL PARK

JANE HOUSTON JONES

Mojo and I attended our first Joshua Tree National Park public star party as members of the Yucca Valley based Andromeda Society Saturday, February 5, 2005. It was a nice contrast to our sidewalk astronomy, which keeps us busy most weekends here in Southern California. The observing site for the public star party is a good long paved parking and adjacent picnic area, with plenty of restroom facilities. Plus there are nice rangers who let the members of the club in the park for free. The star parties are publicized in the National Park newsletters, and on flyers posted on bulletin boards all over the park.

Our main objective was to observe Saturn and the moons of Saturn through our 7-inch refractor. A few of the club members stopped by for a look, and, yes Saturn looked stunning. The Cassini and Encke divisions were prominent. Each of Saturn's three main rings was distinct in color. The outer A-ring was darkest, the broad B-ring was brightest, and the inner crepe or C-ring was subtle, nearly invisible except where the planet's disk lit the faint ring material - here the crepe ring was easy to see against the disk of Saturn. The dark butterscotch colored belts and bright honey colored zones alternated and the color gradually darkened closer to the two south temperate belts and the south polar belt region, which was very dark, almost molasses color. Hmmm. Butterscotch, honey and molasses. ☺ The south equatorial belt of Saturn showed wind-blown ripples and notches. I sometimes sketch Saturn, but it was just too cold to take off my gloves and hand warmers to hold the pencils. Here is a nice map showing all the features I mention, plus many more which I did not mention. <http://stars5.net/firms.com/satnori.jpg>

The next project on my clipboard was observing Iapetus, Saturn's third largest moon. Iapetus is brighter at western elongation and fainter at eastern elongation, which makes it a great repeatable observing project. Iapetus reached its brightest western elongation February 4th, and I have been watching it, and comparing its brightness to nearby stars for the past several weeks. I printed some star charts for Saturday night, and noted the magnitude of all the adjacent stars to help me confirm its magnitude, which was a fraction more than 10. There were nearby 11.5 mag stars and mag 9 stars to compare to, and a clear dark night for the project. After Iapetus, it was time to move from the solar system into the rest of our Milky Way galaxy. Oh, we had good long looks at Comet Machholz first. What a beautiful comet it is!

In the dark sky, the tail was very long, and the comet was bright, still a naked eye object. We probably had a couple dozen members of the public stop by for looks at Saturn and the comet, and later I did a top 20 type Messier show for some other interested visitors. By 8:30 they were all frozen and heading to warm cars or sleeping bags or both.

My next project was from Sky and Telescope magazine. In the February 2005 issue, Jim Kaler weaves a story of stellar birth, life and death in Taurus and Auriga. When we look at this part of the Milky Way, we are looking out through the thinnest part of the galactic disk, through a large dusty interstellar cloud, the Taurus-Auriga star-forming region.

The article, on page 90 is called "Through Taurus to the Anticenter" and just reading the article gives you a firm grasp of stellar evolution (Jim's specialty) all nicely packaged in an observing project. I love it when that happens. I always learn something. I won't detail every object, but there are 17 open clusters and 18 variable stars in the project. My favorite open clusters were a couple pairs of clusters, NGC 1807 and 1817, which touch each other, and NGC 1750 and 1758, which are separated in our line of sight by 500 light years. Amazing! Many of the objects are favorite Messiers like M35, the Pleiades, Hyades and the three "M"s in Auriga, M36, 37 and 38. An easy and quick star hop, requiring nothing more than the magazine star charts and a red flashlight, exactly my kind of low tech observing tools. I used my 12.5-inch reflector to view the clusters.

For the variable stars, I moved back to the refractor. Just taking a one-time look at these variables means glimpsing at wild places in our milky way. Some are eclipsing binaries, and the remainder tell the story of stellar evolution from newly forming protostars to main sequence hydrogen fusing stars like our sun to old giants that have quit fusing helium, on to carbon stars. Just observing one moment in one day in the life of these wild things was exhilarating.

Well, that took about 2 hours, and did I mention it was really cold? At midnight we packed up and drove back home, about a two-hour drive. We both had a great time, and look forward to next month's public star party in the high desert. A highlight for me was having a good look at Canopus, known to ancient Arabs as the ship of the desert. A perfect star to see from Joshua Tree National Park.

Location: Hidden Valley picnic area, Joshua Tree National Park. Altitude: 4,208 feet, temperature brrrrrrr

Latitude: 34° N. Longitude: 116° W

Seeing: good 4/5 in parts of the sky, limiting magnitude using area 16

Alpha Cvn, Epsilon and Eta UMa and area 8 Alpha, Beta, Zeta Tau LM 6.3

Equipment: LITEBOX reflector: f/5.75 12.5-inch at 96X with 19 Panoptic and 202x with 9mm Nagler

F/9 Astro Physics 180EDT refractor, up to 280x using a 19mm Panoptic eyepiece, and some Zeiss Abbe Orthos at higher power

## **IAPETUS: EAST IS LEAST AND WEST IS BEST JANE HOUSTON JONES**

Saturn's moon Iapetus is brighter at western elongation and fainter at eastern elongation, which makes it a great observing project when the Saturn system is in our evening skies...like right now.

I was reading about Saturn's satellites in the RASC 2005 Observers Handbook in early January, just as I was observing the Cassini orbiter's first close-up images of Iapetus on my computer. Not everyone who takes a look at Saturn observes Iapetus, although it's Saturn's third largest moon. Iapetus is easier to locate near Saturn at both inferior and superior conjunction, when it is closest to the planet and visible to the north and south of the planet, respectively. But its 79 day orbit takes Iapetus far outside the usual planetary eyepiece view. In fact Iapetus is 3 times further from Saturn than Titan, or 12 ring diameters from Saturn when it shines the brightest.

The magnitude of Iapetus varies from 10.1 at western elongation to 11.9 at eastern elongation. We have known for a long time that the leading side of Iapetus is dark as coal, while the trailing side is bright as snow. We are looking at the bright trailing side of tidally locked Iapetus when it is at western elongation, and we are looking at the dark leading side of the moon at eastern elongation. Why this is so is still under debate, as it has been for the past 334 years. Cassini discovered Iapetus in 1671 and he made the note that he could only see Iapetus on one side of Saturn and not on the other side. The dark area of Iapetus is called Cassini Regio, in his honor, and may be dark because the leading side of Iapetus collides with or alters dust from the moon Phoebe. Stay tuned as the Cassini instrument teams study the Iapetus data, and release their findings. Cassini will have one more flyby of Iapetus in September 2007. This year, on January 1, Cassini flew by Iapetus at a distance of 40,000 miles. The 2007 flyby will be from a distance of 763 miles.

To find Iapetus at either conjunction or elongation, and compare its brightness to nearby stars, use your favorite planetarium program to calculate the extreme magnitudes of Iapetus, and to compare it to nearby stellar magnitudes. SJAA's Akkana Peck created some Iapetus charts which should help you find Iapetus on March 15 and April 24, as it swings from eastern to western elongation. You'll find and a few other dates charted here as well: <http://www.shallowsky.com/iapetus>. Read Akkana's monthly column in the SJAA Ephemeris too! <http://ephemeris.sjaa.net/>

Here is a list of key Iapetus observing dates. [editors make into a table if you want - that is how it is displayed in the 2005 RASC Observers Handbook page 205]

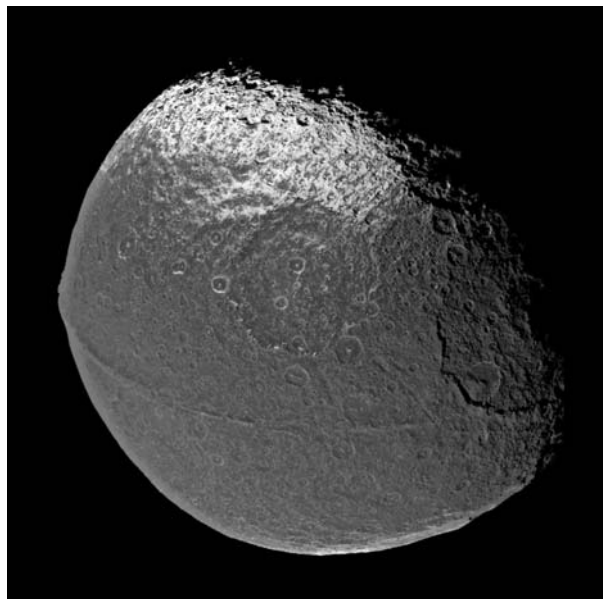
Eastern elongation (dark side of Iapetus faces earth, magnitude 11.9): March 15, June 4, August 25, Nov 13

Inferior conjunction (Iapetus is north of Saturn): April 5, June 25, Sep 14, Dec 3

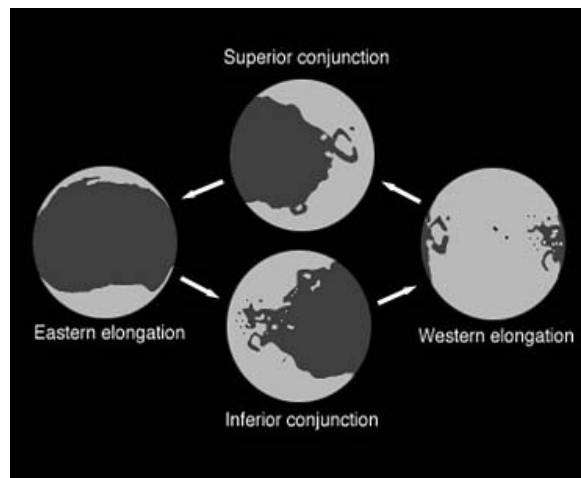
Western elongation (bright side of Iapetus is facing earth, magnitude 10.1): April 24, Jul 14, Oct 4, Dec 22

Superior conjunction (Iapetus is south of Saturn): May 14, Aug 3, Oct 23

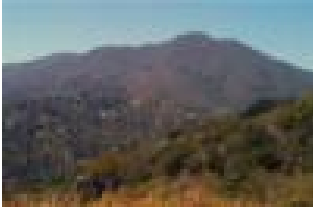
Jane Houston Jones  
JPL Cassini Outreach  
[jane.h.jones@jpl.nasa.gov](mailto:jane.h.jones@jpl.nasa.gov)



**Credit: NASA/IPI /Space Science Institute**



**Credit: NASA/JPL/Space Science**



## 2004 MT TAM ASTRONOMY PROGRAMS TINKA ROSS

### Mt Tam Enthusiasts

Spring is nearly here, which means the start of another series of astronomy programs on Mt Tam, our 17th year!

We start on **Saturday, March 19, at 7:00pm** with a talk on *"Healdsburg Glass and the Tektite Question"* by **Dr. Rolfe C. Erickson** from Sonoma State University. Small, dark, glassy rocks being found in local vineyards may be evidence that the area was struck by an ancient asteroid. Maybe you have collected some tektites yourself without realizing it. You can bring your picnic dinner to the theatre and talk with Dr. Erickson before the program. Weather permitting, there will be viewing after the talk.

The entire series can be found at our website: [www.mttam.net](http://www.mttam.net) and I have attached a copy here for you.

Please help spread the word and forward this on to anyone who may be interested.

This is a good time to let me know if you wish to be dropped from this mailing list, or if you have friends to add to it.

Please note the new contact address: [www.tinkaross@comcast.net](mailto:www.tinkaross@comcast.net)

**2005 Astronomical Diaries** are still available. \$10 at the programs, \$11 by mail to cover postage and handling. Checks payable to MTIA. Send to Tinka Ross, 89 Dominican Drive San Rafael, CA 94901

## 2005 MT TAM ASTRONOMY PROGRAMS

**MARCH 19 - 7:00pm - HEALDSBURG GLASS AND THE TEKTITE QUESTION**, Dr. Rolfe C. Erickson, Sonoma State University  
Are dark, glassy rocks found locally evidence that an ancient asteroid impacted the Western United States?

**APRIL 16 - 8:30pm - EINSTEIN'S MAGIC YEAR**, Professor Lewis Epstein, San Francisco City College  
In one year, 100 years ago, Einstein published monumental papers on Special Relativity, the Photoelectric Effect and Brownian Motion, forever changing our view of the physical universe.

**MAY 14 8:30pm - ANCIENT ASTRONOMY, THE FIRST SCIENCE**, John Dillon, The Randall Museum-San Francisco  
The pinnacle of ancient Greek science was the amazingly sophisticated astronomy developed more than 2000 years ago at the legendary Museum of Alexandria.

**JUNE 11 - 8:30pm - GALAXIES LIKE TO LIVE TOGETHER**, Dr. Roy R. Gal, U.C. Davis  
How are galaxies distributed throughout the universe and what can surveys of galaxy clusters teach us about cosmology.

**JULY 9 - 8:30pm - POSTCARDS FROM SATURN: CASSINI EXPLORES THE LORD OF THE RINGS**,  
Dr. Mark Showalter, SETI Institute  
An update on the latest and greatest results from the Cassini Spacecraft, revealing wonders of the Saturn's rings, moons and clouds.

**AUGUST 13- 8:00pm - EXPLORING THE MEANING OF LIFE**, Dr. Emma Bakes, NASA-Ames Research Center  
What evidence is there for the universal formation of life throughout the cosmos.

**SEPTEMBER 10 - 8:00pm - "BLACK HOLES: THE SCIENCE BEHIND THE SCIENCE FICTION"**  
What are black holes? How are they discovered? How do they give rise to some of the most remarkable and bizarre phenomena in the universe?

**OCTOBER 8 - 7:30pm - FIRST LOOK INSIDE A COMET**, Rick Grammier, Jet Propulsion Laboratory  
July 2005 Deep Impact's spacecraft will arrive at Comet Tempel and become the first mission to impact the surface of a comet.

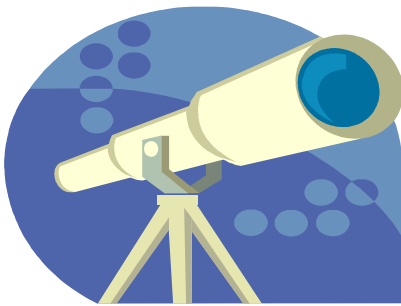
## **BE PART OF THE MT TAM ASTRONOMY PROGRAMS**

### **VOLUNTEERS ARE NEEDED TO KEEP THESE PROGRAMS GOING**

We need YOU to become a VIP (*Volunteers In Parks also Very Important Person*). No experience is necessary. You can park cars, greet the audience, or help set up and take down our equipment, and still enjoy the speaker and observing session.

Participants need to attend a one-time, two-hour orientation before working as a State Park VIP. Volunteer orientations with Interpretive Ranger Sam Toffoli will be held before the astronomy programs on **March 19 (4-6pm), May 14 (5-7pm) and July 9 (5-7pm)**.

Call Tinka at 415-454-4715 or send a return e-mail and sign up now to insure that our programs will continue.



## **SAN FRANCISCO AMATEUR ASTRONOMER'S SPECIAL USE PERMIT EVENT DATES**

THESE ARE MEMBERS ONLY EVENTS AT OR NEAR NEW MOON  
AND USUALLY THE WEEKEND BEFORE THE  
MOUNT TAM STAR PARTY

<b>MONTH/DATE</b>	<b>LOCATION</b>	<b>PURPOSE/CIRCUMSTANCES</b>
SATURDAY MARCH 12TH	ROCK SPRINGS	MESSIER MARATHON & MERCURY G. ELONGATION 18 <sup>h</sup>
FRIDAY APRIL 8 <sup>TH</sup>	ROCK SPRINGS	ANNULAR SOLAR ECLIPSE
SATURDAY MAY 7TH	ROCK SPRINGS	CERES OPPOSITION/AQUARID METEOR
SATURDAY JUNE 4 <sup>TH</sup>	ROCK SPRINGS	VIRGO SUPERCLUSTER
SATURDAY JULY 2 <sup>ND</sup>	ROCK SPRINGS	VENUS N OR M44 OR MERCURY
SATURDAY AUGUST 6 <sup>TH</sup>	ROCK SPRINGS	NEPTUNE OPPOSITION
SATURDAY SEPTEMBER 10TH	BOOTJACK/ ROCK SPRINGS	SFAA STAR-B-Q BOOTJACK AND OBSERVING AT ROCK SPRINGS
SATURDAY OCTOBER 1 <sup>ST</sup>	ROCK SPRINGS	WILLIAM HERSCHEL'S BIRTHDAY
SATURDAY OCTOBER 29TH	ROCK SPRINGS	MARS CLOSEST APPROACH 21 ARC/SECONDS DIA.





# *Desert Sunset Star Party*

May 4-8, 2005

Caballo Loco Ranch  
South of Three Points, AZ

**Speakers - Door Prizes - Day Trips**

Area Attractions

Kitt Peak National Observatory UA Mirror Lab  
Whipple Observatory/Mt Hopkins Old Tucson  
Pima Air and Space Museum Titan Missile Museum  
Flandrau Planetarium Biosphere 2 Center  
Arizona Sonora Desert Museum'  
And much more

**SPONSORED BY PAT AND ARLEEN HEIMANN**

Additional information and Registration materials are available on our website  
<http://www.chartmarker.com/sunset.htm>

The Ranch is located south west of the Sierrita Mountains which block the glow from Tucson. 11.5 south of Three Points, The telescope field will be set up near the campground - there are only 15 RV sites with full hookups. But there are plenty of places to set up without hookups and there is a dump station nearby. There are also two bathhouses.





# Lawrence Hall of Science

University of California, Berkeley

## MARCH 20, 2005

### "ALIEN EARTHS" EXHIBIT

#### SEARCHING FOR EXTRA TERRESTRIAL LIFE LECTURES

ADMISSION TO MARCH 20 LECTURES FREE TO SETI, AANC, AND ASTRONOMICAL SOCIETY OF THE PACIFIC MEMBERS

GENERAL INFORMATION: (510)642-5132

WEBSITE AND MAP:

[HTTP://WWW.LAWRENCEHALLOFSCIENCE.ORG](http://www.lawrencehalloffscience.org)

THE ALIEN EARTHS EXHIBIT RUNS AT LHS FEBRUARY 5 THROUGH MAY 8

LAWRENCE HALL OF SCIENCE IS ON CENTENNIAL DRIVE BELOW GRIZZLY PEAK IN THE BERKELEY HILLS.

#### SCHEDULE OF TALKS FOR MARCH 20, 2005

**12:30 - Dr. Margaret Race: "Looking for ET-- Bring 'em Back Alive... and Carefully"** - perspectives from an expert in the field of planetary protection, analyzing issues of cross-contamination both in space and on Earth.

**1:30 Dr. William Borucki, NASA Ames Research Center - "The Search for Habitable Planets Around Other Stars"** - Over 100 giant planets orbiting other stars have already been found by ground-based telescopes. Dr. Borucki will describe future space-based missions necessary to find habitable Earth-sized planets, including the upcoming Kepler mission based at NASA Ames Research Center.

**2:30 Dr. Emma Bakes - "How does life evolve? An exploration of Titan and Europa as possible alien habitats"**  
Water has always been nominated as one of the essential ingredients for life and our own planet Earth yields conclusive proof. However, the main requirements for sources of extraterrestrial life might be thought of as a substance as the triple point (i.e., existing as a solid, a liquid and a gas at the same time) and a source of energy to fuel its organization into single celled organisms. We discuss the types of potential life which may inhabit Europa and Titan and how this may predict the nature of extraterrestrial life in other star systems.

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*Dr. Margaret Race, a biologist at the SETI Institute, works closely with NASA in studying scientific, policy and public issues associated with solar system exploration. She has served on three major studies with the National Research Council (NRC) Space Studies Board involving planetary protection, and recently completed work on two major NASA projects related to Mars exploration- one that developed scientific protocols for the quarantine and testing of returned Martian samples, and another that analyzed the technical and scientific issues associated with human missions to Mars. Her studies also focus on legal and*

*regulatory aspects of Mars sample return proposals; public involvement in the review and approval process for sample return; ethical implications of solar system exploration, and educational outreach about Astrobiology both through schools and the mass media.*

*Dr. William Borucki is the Principal Investigator of the NASA Kepler mission designed to detect Earth size planets in the habitable zones of stars. He has been immersed in photometry work for over 20 years and is a recognized leader in the field.*

*Dr. Emma Bakes has all the time in the world---not Earth, however, but an exotic moon orbiting a distant planet in our solar system. Bakes, a SETI Institute scientist and NASA Astrobiology Institute (NAI) lead team member, studies the chemical evolution in the atmosphere of Titan, Saturn's giant satellite and the only known planetary companion in our solar system swaddled in a thick atmosphere. Rich in large, complex carbon- and nitrogen-bearing chemicals, Titan's dense smog-like haze is thought to be similar to the primitive atmosphere of early Earth. Inside Bakes' powerful Sun Microsystems processor, the smoggy shroud evolves at breakneck speed. Millions of years of complex chemical reactions condense into hours. And what results may help us learn more about how life emerged and survived on Earth. Emma Bakes got her PhD 14 years ago and in the interim has done research at Princeton University, worked as a professor at Vassar College and a Principal Investigator at the SETI Institute and NASA Ames Research Center. She has written two books on Astrophysics and Astrobiology and has chaired a NASA space mission concept to sample the outer solar system. She is currently involved in research concerning the origins of life, planetary atmospheres, star formation and space medicine. Her passions are exploration, discovery and pioneering new ground in the sciences, medicine and in everyday life. However, by far the greatest source of wonder has been her fellow human beings. See also:*

<http://quest.arc.nasa.gov/people/bios/women/eb.html>

The exhibit Alien Earths was developed by the Space Science Institute in Boulder, Colorado, with funding from the National Aeronautics and Space Administration (NASA) and the National Science Foundation. It is a hands-on exhibit that covers the search

for life, as well as orients individuals to both the possibilities and the obstacles that figure into exploring space. The exhibit is divided into four areas:

Our Place in Space • Star and Planet Formation • Planet Quest • Search for Life

Interactive and multi-media presentations in the exhibit will allow visitors to:

Set planets in motion around a star and see what happens • Experiment with an infra-red camera  
Listen to sounds from space • Learn about microbes, the most abundant life form on Earth and possibly elsewhere

Admission to LHS is \$8.50/adults; \$6.50/ youth (5-18), full-time students, senior citizens, and the disabled; \$4.50/children 3-4; and free for children two and under.

SETI Institute and the NASA Kepler mission are a co-sponsors of the LHS run of the Alien Earths exhibit.

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## **FRIDAY, MARCH 4TH, 2005 - 7:00 PM IS THERE LIFE ON MARS?**

The story behind the landings and findings of the Mars Exploration Rovers –  
Spirit and Opportunity

**DR. FIROUZ NADERI**

**NASA'S MARS EXPLORATION PROGRAM MANAGER**

**FAZ RESTAURANT - BALLROOM**

**1 108 N. MATHILDA AVENUE, SUNNYVALE, CA**

**ADMISSION: \$15, MEMBERS \$10**

**EVENT INFORMATION: 408-605-5591**

Dr. Naderi has spent the last decade managing NASA programs in pursuit of a most fundamental question - are we alone in the universe? The contribution our civilization makes to answering this question, he says, will be the legacy for which we will be remembered even centuries from now after transient issues of today are long forgotten.

Currently he is the head of the Mars Exploration Program at JPL. The program has the goal of determining if Mars is, or if it ever was, a habitat for life. In the summer of 2000, he helped design this program, which will see one or more spacecraft launched to Mars every 26 months. During his tenure, three successful missions have orbited or landed on Mars including the two recent Mars rovers - Spirit and Opportunity.

Prior to becoming the head of the Mars program he spent four years as the program manager of the Origins Program- NASA's ambitious plan to search for other Earths around other Suns.

Dr. Naderi who received his Ph.D. from the University of Southern California(USC), has been with JPL for 25 years a career which spans program and project management for satellite communications systems, Earth remote sensing observatories, astrophysical observatories and planetary systems. He is the recipient of a number of individual and group awards including Technology Hall of Fame medal, the NASA's Outstanding Leadership Medal, and this year's Liberal Prize winner awarded by an Italian foundation to an international personality who has "contributed profound changes in ideas in modern times".

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**

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**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.