

# ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 60, No. 10 - October 2012

## **GENERAL MEETING**

**Wednesday, October 17, 2012**

Randall Museum . 199 Museum Way . San Francisco

7:00 pm Doors Open . 7:30 pm Announcements . 8:00 pm Speaker  
*SFAA's General Meetings occur 3<sup>rd</sup> Wednesday of each month (except January)*

## ***Galaxy Formation in a Dark Universe***

a presentation by

**Risa Wechsler**

**Stanford University**



Join Risa Wechsler (Stanford University) for a presentation on ***Galaxy Formation in a Dark Universe***. Wechsler will discuss our current understanding of how galaxies form, and how these observations can be used to shed light on the physics of the Universe. Recent cosmological measurements indicate that a mere four percent of the contents of the Universe is made up of stars, gas, and the normal stuff we interact with every day. An unobserved substance called dark matter dominates the mass in the Universe. In this talk, Wechsler explains how this dark matter and dark energy determine the fate of galaxies.

Risa Wechsler is a cosmologist, an Assistant Professor of Physics at Stanford and at the SLAC National Accelerator Laboratory, and a member of the Kavli Institute for Particle Astrophysics and Cosmology. Her work primarily focuses on the formation of cosmological structure, from the scales of the smallest galaxies to the largest scales in the Universe. She is a former Hubble Fellow, Fermi Fellow, and Kavli Fellow, and has received a Terman Fellowship and Hellman Fellowship for her research at Stanford.

## **PRESIDENT'S MESSAGE**

Thanks to those wonderful Club Members who turned out last month at the Dominican University with scopes and wisdom, ready to share the wonders of astronomy with 120 First Year Students as part of the University's ground-breaking Big History Program. The SFAA is a big supporter of this event, and this year, in addition to lines of excited and engaged young adults lining up to look through telescopes, we put on a Star and Constellation Tour that was a true highlight of the evening.

This past Members-Only night on Mt Tam was beautiful and clear, but very windy...which made astro-photography a challenge for some members who had set up with high hopes of testing their new equipment! As something of a consolation prize, at least there was abundant pizza and dessert as the Club put on a 'tailgate' party in place of our annual StarBQ. The extremely dry conditions up on Mt Tam limiting BBQs, and conflicting schedules had made it tough to organize a BBQ, but gave us the inspiration to try something new! Those of us who made it on Saturday liked the celebration up at Rock Springs parking lot, because we didn't have to rush to pack up and set up after the BBQ. I'd love to get your feedback.

Next Saturday 20<sup>th</sup> October is the final Public Star Party on Mt Tam for this year. Come up and join in as the club volunteers with public outreach, when hundreds of visitors file into Rock Springs post-lecture, keen to get a view through a scope.

Since there is no Randall Museum lecture in November, we will be kicking off the process of 2013 Board Member elections this month. Keep an eye out for announcements via mail, or join us at this week's lecture to find out more.

Wishing you dark, still, clear skies.

**SUE-ELLEN SPEIGHT**  
**President 2012**  
**San Francisco Amateur Astronomers**



**MT. TAMALPAIS STATE PARK**  
**MT TAMALPAIS INTERPRETIVE ASSOCIATION**  
**2012 ASTRONOMY PROGRAMS**

**All programs are FREE, open to all, and sponsored by your State Park.** Please dress appropriately (it can get cold), bring a flashlight and car pool if possible. If the weather is iffy on the program date, check our **hot line, 415-455-5370**. The message is updated about 3:00pm IF there is any change in the schedule. Note that while observing is affected by clouds, the fog usually does not reach our observing area and generally dissipates after sundown. Lectures are cancelled only in cases of rain or if fire danger closes the park.

Our 24th series of astronomy lectures on Mt Tam is nearly over with only one program left,

**Oct 20 Dr. Chris McKay, NASA-Ames Research Center**  
**7:00pm "MSL and the Search for Organics on Mars"**

Chris McKay was our very first speaker back in 1988, and he has returned about every five years to give us updates on the exploration of Mars. With the Curiosity rover currently exploring the surface of Mars, more sophisticated searches for evidence of life on the red planet are underway. Come and hear first hand what the research teams at NASA are learning.

Chris' engaging style and exciting information promises to be a stellar ending to the series.

But wait! While that is our last regularly scheduled program of the current series, we have one more chance to enjoy the mountain this year. We will be participating in the Second Annual Bay Area Science Fair, a week long celebration of science with events at hundreds of venues Oct 26 through Nov 4 organized by UCSF. Check it out at [www.bayareascience.org](http://www.bayareascience.org). Last year we were rained out, but we will try again. This program will be co-sponsored by Wonderfest .

**Nov 3 Dr. Kevin Zahnle, NASA-Ames Research Center**  
**7:00pm "When Worlds Collide & A View of the Heavens"**

Planetologist Dr. Zahnle reminds us that the famous K/T extinction event (death knell of the dinosaurs) shows that, even today, the collision of Earth with a small world gone astray can refresh the face of our planet.

Impacts were much larger and more frequent on the early Earth. In all likelihood, impacts posed the greatest challenge to the survival of early life; and they remain a major threat, today.

Enjoy a short "sky tour" of the night sky from the Mountain Theatre. Following the Q&A at the end of each talk, those in the audience not familiar with the night are invited to stay a few minutes while **Paul Salazar, the**

**Urban Astronomer**, points out bright objects and constellations. Check out Paul's blog:

<http://urbanastronomer.blogspot.com/>

then come up to the Mountain and join his monthly sky tours. You can also catch his sky tours on the grass roof of the California Academy of Sciences on Thursday evenings.

And of course the perfect ending to the evening is viewing through the telescopes provided by the San Francisco Amateur

Astronomers in the Rock Springs Park Lot. These dedicated volunteers are a treasure trove of information which they

willingly share. What a great way to give the youngsters in your life a truly stellar experience!

Also NEW is a Mt Tam Astronomy facebook page. Join at <http://www.facebook.com/pages/Mt-Tam-Astronomy/195684910537344>

And don't just join us, but share your spacey thoughts!

***Thanks for informing others of our programs. See you on the Mountain - and bring a friend!***

**October 25, 2012 at 7 PM  
Free Public Lecture  
USGS Menlo Park Campus**

**EXPLORING MARS WITH CURIOSITY  
KEN HERKENHOFF**

**- SEARCHING THE MARTIAN SURFACE FOR EVIDENCE OF  
HABITABLE CONDITIONS**

**USGS ASTROGEOLOGY SCIENCE CENTER  
345 Middlefield Road, Menlo Park**

- \* The Mars Science Laboratory rover "Curiosity" landed successfully on August 5th to begin a 23 month mission
- \* What have scientists discovered so far, particularly with respect to the geology of the Gale crater landing site?
- \* Instruments aboard Curiosity are searching for evidence of environmental conditions that could support microbial life
- \* How are dust and rocks analyzed and studied to learn about the role of water in forming the Martian landscape?

Part of the USGS Evening Public Lecture Series: <http://online.wr.usgs.gov/calendar>  
Call 650-329-5000 for more information

Directions to U.S. Geological Survey Campus:  
The USGS Menlo Park Science Center is located at 345 Middlefield Road in Menlo Park

From San Francisco

- Exit highway 101 at Marsh Road, Atherton
- Go west to the T-junction with Middlefield Rd.
- Turn left (south)

From San Jose

- Exit highway 101 at Willow Road, Menlo Park
- Go west to Middlefield Rd.
- Turn right (north)

Enter the USGS campus at Survey Lane with large stone markers labeled "U.S. Geological Survey"

Event Flyer: <http://online.wr.usgs.gov/calendar/2012/Oct12flyer.pdf>



<http://www.bayareascience.org/>

## 2012 BAY AREA SCIENCE FESTIVAL STAR PARTY

<http://astrosociety.org/education/2012-bay-area-science-festival-star-party/#sf>

### Friday Evening, October 26, 2012

Organized by Andrew Fraknoi (*Foothill College*)

As part of the second annual Bay Area Science Festival, we are throwing a regional star party (telescope observing night) at over a dozen different sites. Colleges, schools, observatories and science centers around the Bay Area will be open, and both professional and amateur astronomers will be on hand to offer telescope viewing and observing tips. If the sky is cloudy, many sites will still offer indoor astronomy activities. Some institutions will also have astronomy talks, open houses, and family events that evening, regardless of the weather. Join us for a stellar evening.

#### Locations:

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#### **Berkeley**

##### **1) YMCA-PG&E Teen Center (teens only!)**

2111 Martin Luther King Jr. Way  
Berkeley, CA 94703

Program jointly sponsored by the YMCA of the Central Bay Area, Bay Area Teen Science (B.A.T.S.), and University of California, Berkeley's Astronomy Department and Space Sciences Laboratory

Free Star Party for all **Bay Area High School Students** only from 7 to 10 pm. Includes:

- Telescope viewing with UC Berkeley Astronomy grad students
- Talks, informal discussions, and other fun activities with UC Berkeley scientists around the latest cutting-edge astronomy research
- Astronomy-themed art activities and computer games
- Snacks and beverages

**\*\*All participants must have a valid high school ID to enter the YMCA-PG&E Teen Center\*\***

More detailed event information to be posted at [www.facebook.com/BayAreaTeenScience](http://www.facebook.com/BayAreaTeenScience)

The YMCA-PG&E Teen Center is located at the corner of Martin Luther King Jr. Way and Center Street, just two blocks from the Downtown Berkeley BART Station. A location map can be found here: <http://goo.gl/maps/VYutd>

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#### **2) The Lawrence Hall of Science**

1 Centennial Drive #5200  
Berkeley, CA 94720

We will be observing from the Lawrence Hall of Science's outdoor *Forces that Shape the Bay* exhibit with our astronomy staff and our cool telescopes, 7–9 p.m. Find constellations; spot double stars; and view star clusters, the Moon, and more deep-sky treasures guided by astronomy experts. Then explore other worlds without even leaving home on our Science On a Sphere® exhibit. Join us for a tour of the fall evening skies! *Note: In the event of poor weather, we will run a Q&A session in the Planetarium in lieu of outdoor observing.* \$5 admission; free for Hall members.

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#### **Brentwood**

Deer Valley High School ACE Academy/Planetarium and the Contra Costa Water District Education program will sponsor a night of observing, 7 – 9:30 PM, at the Los Vaqueros Reservoir, 100 Walnut Blvd, Brentwood, CA. In case of inclement weather the program will be rescheduled. Admission is free and open to the public.

More info: [www.dvACEacademy.com](http://www.dvACEacademy.com) or contact astronomyteacher@mac.com.

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#### **Hayward**

##### **1) Chabot College Astronomy Department**

25555 Hesperian Blvd.

Hayward, CA 94545

- Free Public Planetarium Show 7:00 – 7:45 PM (seating is limited, and reservations are required)
- Free public viewing from 8 PM – 9:30 PM at the College. See:  
<http://www.chabotcollege.edu/faculty/shildreth/basf2012.htm> for more information.

For a campus map, please visit: <http://www.chabotcollege.edu/about/CampusMap.cfm>

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## **2) California State University East Bay**

25800 Carlos Bee Boulevard

Hayward, CA 94542

Star Party, from 6-8 pm, on the Science East Lawn Picnic Area.

For a campus map, see: <http://www20.csueastbay.edu/about/visitor-information/maps-campus-locations/hayward-campus-map/index.html>

For more information, contact:

Dr. Gary Weston: [gary.weston@csueastbay.edu](mailto:gary.weston@csueastbay.edu), (510) 885-3448

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### ***Los Altos***

Foothill College Observatory Star Party

12345 El Monte Rd.

Los Altos Hills, CA 94022

Hosted by the Peninsula Astronomical Society. Observatory will be open free to the public, 7 to 11 pm, with additional telescopes near the entrance.

Please park in the west end of Parking Lot 3 and walk uphill to the observatory, which is located next to the Krause Center.

Please note that parking costs \$3.

For directions to the observatory and Parking Lot 3, see the map at:

<http://www.pastro.org/dnn/Observatory/Maps.aspx>

For more on the astronomy program, see: <http://www.foothill.edu/ast>

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### ***Oakland***

Chabot Space & Science Center

10000 Skyline Blvd.

Oakland, CA 94619

Star Party with the East Bay Astronomical Society, 6pm-10pm (Center open 10am-10pm); all activities included with general admission! Visit the observatory deck to gaze through our large telescopes, free-standing 'scopes, and tour our domes. On the inside, enjoy music, drinks, a café conversation on Maya astronomy with author Jeanine Kitchel, a live planetarium show, and a human constellation scramble where you are the stars!

For more information: [www.chabotspace.org](http://www.chabotspace.org), (510) 336-7373

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### ***Rohnert Park***

Sonoma State University Observatory

1801 East Cotati Ave.

Rohnert Park, California 94928

Public Viewing Night, 8:00 – 10:00 pm, with a focus on "Our Nearest Neighbor, The Moon."

Schedule, map and contact info: <http://www.phys-astro.sonoma.edu/publicviewingnight.shtml>

The Observatory is located inside the stadium area at the SE corner of the campus (East Cotati Avenue and Petaluma Hill Road, 2 miles east of U.S. 101 at Cotati.)

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### ***Salinas***

Hartnell College Planetarium

411 Central Avenue

Salinas, CA 93901

Telescopes for will be set up for viewing on the top level of the nearby parking structure after the two regularly scheduled planetarium shows. See: <http://www.hartnell.edu/planetarium/schedule.html>

For directions the Hartnell Main Campus: <http://www.hartnell.edu/about/hartnell.html>

For a campus map, see: [http://www.hartnell.edu/about/hartnell\\_campus.html](http://www.hartnell.edu/about/hartnell_campus.html)

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### ***San Francisco***

San Francisco State University  
Thornton Hall, 1600 Holloway Ave.  
San Francisco, CA 94132

- Planetarium Shows at 8 pm and 9 pm (The planetarium is on the 4th floor of Thornton Hall — Room TH422; Go in the main door of the building, take the elevator to the 4th floor, and look for the planetarium entrance there. Once a show has started, you can't get in.)
- Telescope viewing in the observatory from 8 pm until 10 pm (The observatory is on the 10th floor of Thornton Hall — Room TH1002; Go in the main door of the building, take the elevator to the 9th floor and follow the signs up to the observatory. You may drop in any time between 8 pm and 10 pm.)
- In case of cloudy weather, telescope viewing will not happen, but demonstrations and Q&A session will occur in Room TH411, just down the hall from the planetarium. Planetarium shows will happen clear or cloudy.

For a campus map see: <http://www.sfsu.edu/~sfsuemap/>

For other directions to the observatory and planetarium see:  
<http://www.physics.sfsu.edu/astronomy/Directions/directions.html>

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### **San Jose**

#### **1) San Jose State University**

Department of Physics and Astronomy  
One Washington Square  
San Jose, CA 95192

Members of the Physics & Astronomy Club will host a star party and a number of activities for children and adults. Tours of the night sky, telescope viewing (Moon, Jupiter, star clusters, etc.) and hands-on demonstrations and activities will be available. Telescopes will be set up on the Tower Lawn, between Tower Hall and the MLK library. No cost/rain or shine. 7PM start time. For more information, visit [www.physics.sjsu.edu](http://www.physics.sjsu.edu)

For a campus map, see: [www.sjsu.edu/map](http://www.sjsu.edu/map)

For campus parking information, see: [www.sjsu.edu/parking/maps/](http://www.sjsu.edu/parking/maps/)

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#### **2) San Jose Astronomical Association**

in Houge Park on Twilight Drive  
San Jose, CA.

140 feet north of the intersection of Twilight and Rupert Drives, turn into the driveway immediately north of the tennis court fence.

7 to 10 pm, telescopes will be set up to show the nearly-full moon, faint planet Uranus, colorful double star Albireo, the Coathanger star cluster, and other objects as conditions permit.

WEBSITE with Google routing: [www.sjaa.net/directions.shtml](http://www.sjaa.net/directions.shtml).

For weather prospects, see <http://www.sjaa.net/hotline.shtml> after 1:00 pm. If conditions change, this page will be updated.

PHONE: After 1 pm, a short weather message will be available at 408-559-1221.

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#### **3) Evergreen Valley College**

3095 Yerba Buena Rd.  
San Jose, CA 95135

The Montgomery Hill Observatory will be hosting the following activities:

- Lunar Geology for Children ages 9 – 12, from 4 to 6 pm. Space is limited and on a first-come first-served bases. For reservations, please contact the astronomer at: [celso.batalha@evc.edu](mailto:celso.batalha@evc.edu)
- Observations of Moon, Jupiter, Uranus, the Pleiades and other interesting celestial sights. Astronomers will be using the roll-off roof building equipped with a 14" Celestron telescope, and the dome building with a 7" refractor. Portable telescopes will be available for public use. The star gazing will be held inside the dome and/or roll-off roof buildings after 7:00 PM. Attendance is free but limited to 50 visitors.

For a campus map, see: [www.evc.edu/maps/campus\\_map.htm](http://www.evc.edu/maps/campus_map.htm)

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#### **4) Independence High School**

1776 Educational Parkway  
San Jose, CA 95133

Independence/Pegasus High School Star Party, 7 to 11 pm in the Planetarium Building.

For a school map, see: <http://ih.ca.campusgrid.net/home/School+Map>

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### ***Santa Cruz***

University of California Santa Cruz

Dept of Astronomy and Astrophysics and the Astronomy Club @ UCSC

A star party for children and adults, with numerous telescopes. Tours of the night sky will include the Moon, Jupiter, and various nebula, globular clusters, and open clusters. Telescopes will be set up next to the Music Center on UCSC's campus.

Pay parking is available in the Music Center parking lot. The event is free to the public and starts at 7:30pm.

The event is contingent on clear skies. Please check the website [http://www.astro.ucsc.edu/news-events/astro\\_club1/](http://www.astro.ucsc.edu/news-events/astro_club1/) for more information about the event and check on the day to see if inclement weather has resulted in cancellation.

Campus maps can be found here: <http://maps.ucsc.edu/>

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### ***Walnut Creek***

Mt. Diablo Astronomical Society Stargazing at:

Heather Farms Park, Dog Park Entrance,

505 North San Carlos Drive,

Walnut Creek, CA 94598

Free admission. If the weather cooperates there will be astronomy activities for all ages from 6 to 6:30 pm, after sundown we'll observe the Moon, star clusters, nebulae and more.

Park in rear lots and walk toward the Dog Park area.

For more information, contact us at

<http://www.mdas.net>

outreachinfo@mdas.net

NIGHT SKY NETWORK

OCTOBER 2012 - THE EVENING SKY

October Sky Map: <http://skymaps.com/skymaps/tesmn1210.pdf>

October Sky Calendar: <http://skymaps.com/articles/n1210.html>

BAY AREA ASTRONOMY EVENTS

<p><b>Wednesday October 17 11:00 AM</b></p> <p><b>HILLER AVIATION MUSEUM 601 Skyway Road San Carlos</b></p> <p><b>Cost: Free with admission</b></p>	<p><b>SATURN V - THE FIRST 700 SECONDS</b> <b>Speaker: FARIDE KHALAF</b></p> <p>As we witnessed each launch of the Apollo program, we would forever remember the countdown, ignition sequence, images of the Saturn V rocket engines billowing out vast, fast and furious hot gas, and then lift off. We'll never forget those sheets of ice breaking off the exterior and raining down on the launch pad as the rocket cleared the tower. What we saw, what we remember, and the extent of what was broadcast on the daily news is a very small fraction of all that lead to NASA's greatest achievements. Highlighting some of the interesting and little known technical aspects of the various missions, Faride Khalaf will take you down memory lane and visit the Apollo program in a unique way. We will focus on some of the details starting from launch preparation to the last rocket blast that sent the gallant crew and their spacecraft to the moon. In this presentation, you'll find answers to questions that Walter Cronkite never thought to ask! Come join us and relive the oldest of human dreams, a dream worth revisiting.</p>
<p><b>Wednesday October 17 12:00 NOON</b></p> <p><b>SETI INSTITUTE Colloquium Series 189 Bernardo Ave Mountain View, CA 94043</b></p>	<p><b>CLIMATE CHANGE: WHAT'S GOING ON WITH THE SUN?</b> <b>DAN LUBIN, SETI INSTITUTE</b></p> <p>Throughout the past century, while greenhouse gas (GHG) abundances have been steadily increasing and influencing Earth's climate, the Sun has remained relatively bright and quiescent. Solar cycles have been steadily active, with instantaneous sunspot numbers at solar maximum exceeding 100 in every cycle since 1893 (Cycle 13). The climate warming we have experienced since the beginning of the modern industrial era cannot be attributed to the Sun. However, the recent minimum between Cycles 23 and 24, and NASA predictions of a substantially lower sunspot number at the 2013 solar maximum, suggest that the Sun's recent bright and quiescent period may be ending. Both autocorrelation studies of recent solar cycles, and studies of solar analogs in nearby field stars, suggest a &gt;40% chance of the Sun entering a new Maunder Minimum sometime in the Twenty First Century. During the historical Maunder Minimum (1645-1715), meteorological data from Europe and proxy records from global oceans indicate a substantially cooler climate, attributable to decreased solar irradiance. In our lifetime, we may therefore see a period of solar dimming in conjunction with increasing GHG abundances. A new Maunder Minimum would not entirely offset the projected GHG-induced warming (the GHG radiative forcing is at least three times larger than best estimates of the solar irradiance decrease). Instead, the complex interactions between radiative balance and atmospheric dynamics yield unusual regional patterns of pronounced warming versus cooling. This seminar will address the physical basis of climate change in the context of both GHG and solar variability, and will also extend the discussion to the influence of stellar variability upon habitable zones.</p>

<p><b>Wednesday October 17 7:00 PM</b></p> <p><b>RANDALL MUSEUM 199 Museum Way San Francisco 94114</b></p>	<p><b>SAN FRANCISCO AMATEUR ASTRONOMERS GENERAL MEETING</b> <b>Free and open to the public</b></p> <p><b>CONNECTING GALAXIES, HALOES AND STAR FORMATION ACROSS COSMIC TIME</b> <b>Speaker: Risa Wechsler</b></p>
<p><b>Wednesday October 17 7:00 PM - 9:00 PM</b></p> <p><b>Foothill College Smithwick Theater 12345 Moody Rd. Los Altos Hills, CA</b></p> <p><b>Cost: Free (\$3 Parking)</b></p>	<p><b>Silicon Valley Astronomy Series</b> <b>FINDING THE NEXT EARTH: THE LATEST RESULTS FROM KEPLER</b> <b>Speaker: DR. NATALIE BATALHA</b> <b>MISSION SCIENTIST FOR NASA'S KEPLER PROJECT</b></p> <p>With the launch of NASA's Kepler spacecraft in 2009, humanity's quest to find planets orbiting other stars took a great leap forward. Dr. Batalha will describe the techniques used by the Kepler team to identify Earth-size planets and update us on the remarkable progress they are making. She will discuss the planets already found (including one like Tatooine in Star Wars, with two suns in the sky), and share what we know so far about the thousands of candidate planets that are in the Kepler data (planets ranging from one-half the size of Earth to twice the size of Jupiter.)</p>
<p><b>Thursday October 18 5:00 PM - 6:30 PM</b></p> <p><b>PARC FORUM 3333 Coyote Hill Road Palo Alto Research Center George E. Pake Auditorium Palo Alto, CA</b></p> <p><b>Cost: Free</b></p>	<p><b>EXPLORING NASA SPACE MISSIONS: CURIOSITY ROVER AND BEYOND</b> <b>Speaker: KENDRA SHORT, JPL</b></p> <p>Have you ever wondered what it would be like to explore space? Engineers and scientists at NASA's Jet Propulsion Laboratory (JPL) get to do that every day! From Earth science to astrophysics to planetary exploration, JPL is responsible for executing exciting and challenging robotic space missions like the on-going Mars Science Laboratory. Kendra Short, Manager of the Mechanical Systems Division at JPL, will share with you an overview of the Jet Propulsion Laboratory and will discuss several of its missions that are in flight or in development. A special focus will be provided on the status of the Curiosity rover as well as sharing stories about the mechanical design challenges getting it ready for launch. She will also highlight some of the future technology developments on-going at JPL including a joint venture between JPL and PARC called the "Printable Spacecraft."</p>
<p><b>Friday October 19 7:45 PM - 10:45 PM</b></p> <p><b>HOUGE PARK Twilight Drive San Jose, CA 95124</b></p> <p><b>Cost: Free</b></p>	<p><b>SAN JOSE ASTRONOMICAL ASSOCIATION</b> <b>HOUGE PARK STAR PARTY</b></p> <p>Meet with members of San Jose Astronomical Society for a Star Party, weather permitting.</p>

<p><b>Friday October 19 7:00 PM</b></p> <p><b>CHABOT SPACE AND SCIENCE CENTER 10000 Skyline Boulevard Oakland 94619-2450</b></p>	<p><b>THE TELESCOPE MAKERS' WORKSHOP</b></p> <p>The Telescope Makers' Workshop is held every Friday night from 7pm - 10pm, excluding major holidays (e.g. Christmas Day and New Year's Day) that fall on Fridays. The Workshop is always closed on Memorial Day Weekend. Attendance every Friday night is not mandatory, and members work at their own pace. The Workshop meets at Chabot Space &amp; Science Center, 10000 Skyline Blvd., Oakland. Contact us for more specific details.</p> <p>Contact: E-mail Richard Ozer (<a href="mailto:rozer@pacbell.net">rozer@pacbell.net</a>) or (510) 406-1914</p>
<p><b>Friday &amp; Saturday October 19 and 20 7:30 PM - 10:30 PM</b></p> <p><b>Every Friday &amp; Saturday evening, weather permitting</b></p> <p><b>CHABOT SPACE AND SCIENCE CENTER 10000 Skyline Boulevard Oakland, CA 94619- 2450 (510) 336-7300</b></p>	<p><b>EXPLORE THE NIGHT SKIES AT THE CHABOT OBSERVATORIES</b> For more information: <a href="http://www.chabotspace.org/">http://www.chabotspace.org/</a></p> <p><b>Free Telescope Viewing</b> Regular hours are Come for spectacular night sky viewing the best kept secret in the Bay Area and see the magnificence of our telescopes in action!</p> <p><b>Daytime Telescope Viewing</b> On Saturday and Sunday afternoons Come view the sun, moon, or Venus through Chabot's telescopes. <b>Free with General Admission. (weather permitting)</b> <b>12 NOON - 5:00 PM Observatories Open</b></p>
<p><b>Friday October 19 9:00 PM</b></p> <p><b>FOOTHILL COMMUNITY COLLEGE 12345 Moody Road Los Altos Hills</b></p>	<p>Foothill Observatory is open for public viewing every clear Friday evening from 9:00 p.m. until 11:00 p.m. Visitors can view the wonders of the universe through the observatory's computer-controlled 16- inch Schmidt-Cassegrain telescope. Views of objects in our solar system may include craters and mountains on the moon, the moons and cloud-bands of Jupiter, the rings of Saturn, etc. Deep space objects including star clusters, nebulae, and distant galaxies also provide dramatic demonstrations of the vastness of the cosmos. The choice of targets for any evening's viewing depends on the season and what objects are currently in the sky.</p> <p>The public viewing programs at Foothill are free of charge and are open to guests of all ages. Please note that the observatory is closed when the weather is cloudy. Also note that visitor parking permits are available from the machines in the parking lots for \$3.00.</p>

	<p>Come to Foothill Observatory and join us in the exploration of our Universe!</p> <p>Foothill Observatory is located on the campus of Foothill College in Los Altos Hills, CA. Take Highway 280 to the El Monte Rd exit. The observatory is next to parking lot 4. Parking at the college requires visitor parking permits that are available from the machines in the parking lots for \$3.00.</p>
<p><b>Saturday October 20 10:00 AM-12 NOON if it is clear</b></p> <p><b>FOOTHILL COLLEGE OBSERVATORY</b></p> <p><b>FOOTHILL COMMUNITY COLLEGE 12345 Moody Road Los Altos Hills</b></p>	<p>Solar observing with a Hydrogen alpha solar telescope every clear Saturday morning. This allows spectacular views of solar prominences and unusual surface features on the Sun not otherwise visible with regular white light telescopes. Admission is free.</p> <p>Foothill Observatory is located on the campus of Foothill College in Los Altos Hills, CA. Take Highway 280 to the El Monte Rd. exit. The observatory is next to parking lot 4. Parking at the college requires visitor parking permits that are available from the machines in the parking lots for \$ 3.00.</p>
<p><b>Saturday October 20 10:00 AM – 2:0 PM</b></p> <p><b>THE HILLER AVIATION MUSEUM 601 Skyway Road San Carlos 94070</b></p>	<p><b>Not astronomy, but too cool to pass up. Besides some of the riders may yet go into space!</b></p> <p><b>BAY AREA X-PLANES</b></p> <p>The thought of Caractacus Potts from Chitty Chitty Bang Bang tinkering in his laboratory conjures up Hollywood images of eccentric inventors, but these creative souls are actually normal people that have a love of flight and a desire to create their own flying machine! While some of these aircraft are economical and can be built for less than the cost of a new car, others are high tech machines more expensive than the fanciest of sports cars.</p> <p>On Saturday, October 20th, the Hiller Aviation Museum hosts a gathering of these homebuilt X-Planes and their builders from around the Bay Area. Join us to meet these magnificent men (and women) and their flying machines.</p> <p><b>X-Plane Test Pilot Dave Morss 11AM</b></p> <p>Recognized by the Society of Experimental Test Pilots, Dave Morss is a rocket pilot, jet pilot, warbird pilot, glider pilot, seaplane pilot, electric airplane pilot, helicopter</p>

	<p>pilot, homebuilt pilot and test pilot. Dave has flown 40 prototype aircraft and is a race pilot with over 250 races to his credit.</p> <p>Come listen to Dave share some of his most exciting and interesting test pilot stories.</p> <p>Event included with museum admission.</p>
<p><b>Saturday October 20 5:30 PM - 11:00 PM</b></p> <p><b>MT. DIABLO STATE PARK Lower Summit Parking Lot Summit Road Clayton, CA</b></p> <p><b>Cost: Free</b></p>	<p><b>GO INSIDE A TELESCOPE</b></p> <p>How do telescopes work? Take an inside look and learn about 400-year-old technology still in use today! Then as it gets dark, enjoy views of the universe through many telescopes!</p>
<p><b>Saturday October 20 6:30 PM</b></p> <p><b>SMCAS STAR PARTIES Crestview Park San Mateo</b></p> <p><b>Cost: Free</b></p>	<p><b>SAN MATEO COUNTY ASTRONOMICAL SOCIETY STAR PARTY</b></p> <p>The City of San Carlos Department of Parks and Recreation and the San Mateo County Astronomical Society have open Star Parties twice a month.</p> <p><b>Reasons to Attend</b></p> <ul style="list-style-type: none"> <li>• If you have kids interested in space or planets bring them here for a real life view of planets, nebula, star clusters and galaxies.</li> <li>• If you are thinking of buying a telescope or want help using a telescope you own, come here to talk with experienced users.</li> <li>• If you think you might have an interest in astronomy come and talk to experienced amateur astronomers.</li> </ul> <p>Setup will begin at sunset and observing about one hour after sunset. In the event of inclement weather (rain, clouds, fog or excessive wind) the star party will not to be held. Because each astronomer makes his or her own decision about bringing their telescope, there is no official cancellation notice.</p> <p>If you would like help with setting up a telescope or would like to learn about telescopes, come at sunset. If you would just like to see the universe through a telescope, come at about one or two hours after sunset.</p>
<p><b>Saturday October 20 7:00 PM - 10:00 PM</b></p> <p><b>COLLEGE OF SAN MATEO Building 36 1700 W Hillsdale Road San Mateo</b></p>	<p><b>JAZZ UNDER THE STARS</b></p> <p>Visit our roof top observatory and see the moon and Saturn thru our telescopes, while listening to KCSM Jazz 91 FM. Dress warmly.</p> <p>No food or drinks in the observatory. Children are welcome and need to be attended at all times. Parking is free in lot 5, Marie Curie</p> <p>Website: <a href="http://collegeofsanmateo.edu/astronomy/jazz.asp">http://collegeofsanmateo.edu/astronomy/jazz.asp</a></p>

<p><b>Cost: Free</b></p>	
<p><b>Saturday October 20 7:30 PM</b></p> <p><b>CHABOT SPACE &amp; SCIENCE CENTER 10000 Skyline Blvd Hauben Resource Center Dellums Building Oakland</b></p> <p><b>Cost: Free</b></p>	<p><b>EAST BAY ASTRONOMICAL SOCIETY</b></p> <p><b>THE VERY BRIGHTEST SUPERNOVAE</b> <b>Speaker: ADAM MILLER, UC BERKELEY</b></p> <p>Website: <a href="http://www.eastbayastro.org/">http://www.eastbayastro.org/</a></p>
<p><b>Monday October 22 7:30 PM</b></p> <p><b>HERBST THEATER 401 Van Ness Avenue San Francisco</b></p> <p><b>Cost: \$22-\$27</b></p>	<p><b>THE BEGINNING &amp; END OF THE UNIVERSE: WHAT PHYSICS SAYS NOBEL PHYSICISTS DISCUSS THE "END" (AND THE BEGINNING) OF THE UNIVERSE</b></p> <p>George Smoot's very first astronomical observation was that the moon was tagging along behind the family car "like my dog, but with greater speed and persistence." By his senior year at MIT his curiosity had focused on the cosmic microwave background radiation (CMB), newly discovered remnants of the big bang. To do something about it he came to Berkeley in 1970, an MIT Ph.D. under his belt. The instruments Smoot and his colleagues flew on NASA's Cosmic Background Explorer in 1989 revealed the first evidence for minute temperature variations in the smooth CMB. His 2006 Nobel Prize honors the discovery of these seeds of galaxies, sources of the galactic spiderwebs that fill the universe today.</p> <p>As a kid Saul Perlmutter wasn't fascinated by telescopes; instead he mulled fundamental questions while practicing his violin, like "Will the universe last forever?" At Berkeley Lab in the late 1980s Perlmutter realized telescopes could answer those questions. Ten years later he announced that the Supernova Cosmology Project he'd cofounded had discovered what no one could have expected: the expansion of the universe isn't slowing down, it's accelerating. Soon named dark energy, the mechanism remains mysterious. By devising ways to find supernovae by the dozens, Perlmutter and his colleagues inspired a race with their rivals that turned cosmology upside down, led to a string of awards, and culminated in last year's Nobel Prize in Physics.</p> <p>Web site: <a href="http://www.cityarts.net/events/">http://www.cityarts.net/events/</a></p>

## NASA SCIENCE CAST

A complete list of ScienceCast episodes may be found on Science@NASA's Youtube channel:

<http://www.youtube.com/user/ScienceAtNASA> . Enjoy!

<http://science.nasa.gov/science-news/>

### The Orionid Meteor Shower

**Oct. 12, 2012:** Usually, waking up before sunrise is a good way to get a head start on the day. On Oct. 21<sup>st</sup>, waking up early could stop you in your tracks.

Blame Halley's Comet. Every year in mid-to-late October, Earth passes through a stream of dusty debris from Comet Halley, and the pre-dawn sky lights up with a pretty display of shooting stars.

"We expect to see about 25 meteors per hour when the shower peaks on Sunday morning, Oct 21st," says Bill Cooke, the head of NASA's Meteoroid Environment Office. "With no Moon to spoil the show, observing conditions should be ideal."



A new ScienceCast video explores the Orionid meteor shower. [Play it](#)

Because these meteors streak out of the constellation Orion, astronomers call them "Orionids."

"The Orionid meteor shower isn't the strongest, but it is one of the most beautiful showers of the year," notes Cooke.

The reason is its setting: The shower is framed by some of the brightest stars and planets in the heavens. Constellations such as Taurus, Gemini and Orion provide a glittering backdrop for the display. But that's not all. This year, Venus and Jupiter have moved into position with Sirius, the Dog Star, to form a bright triangle in the eastern pre-dawn sky. On the morning of Oct 21<sup>st</sup>, blazing pieces of Halley's Comet will cut straight through the heart of this celestial triad.

To see the show, Cooke suggests going outside one to two hours before sunrise when the sky is dark and the constellation Orion is high overhead. Lie down on a blanket with a broad view of the heavens. Although Orionids emerge from a small area near the shoulder of Orion, they will spray across the entire sky.

"Be prepared for speed," he adds. "Meteoroids from Halley's Comet strike Earth's atmosphere traveling 148,000 mph. Only the November Leonids are faster."

Speed is important because fast meteors have a tendency to explode. Occasionally, Orionid fireballs will leave incandescent streams of debris in their wake that linger for minutes. Such filaments of meteor smoke twisted by upper atmospheric winds into convoluted shapes can be even prettier than the meteors themselves.

"It really is a wonderful morning to be awake," says Cooke. "Just don't plan on going anywhere in a hurry."

## NASA Spacecraft Records 'Earthsong'

**Oct. 1, 2012:** In space, they say, no one can hear you scream.

Nobody ever said anything about singing, though. A NASA spacecraft has just beamed back a beautiful song sung by our own planet.

"It's called chorus," explains Craig Kletzing of the University of Iowa. "This is one of the clearest examples we've ever heard." [\[Play the audio\]](#)



A new ScienceCast video explores the eerie-sounding radio emissions that come from our own planet. [Play it](#)

Chorus is an electromagnetic phenomenon caused by plasma waves in Earth's radiation belts. For years, ham radio operators on Earth have been listening to them from afar. Now, NASA's twin Radiation Belt Storm Probes are traveling through the region of space where chorus actually comes from--and the recordings are out of this world.

"This is what the radiation belts would sound like to a human being if we had radio antennas for ears," says Kletzing, whose team at the University of Iowa built the "EMFISIS" (Electric and Magnetic Field Instrument Suite and Integrated Science) receiver used to pick up the signals.

He's careful to point out that these are not acoustic waves of the kind that travel through the air of our planet. Chorus is made of radio waves that oscillate at acoustic frequencies, between 0 and 10 kHz. The magnetic search coil antennas of the Radiation Belt Storm Probes are designed to detect these kinds of waves.

"Chorus emissions are front and center for the Storm Probe mission," says Kletzing. "They are thought to be one of the most important waves for energizing the electrons that make up the outer radiation belt."

In particular, chorus might be responsible for so-called "killer electrons," high-energy particles that can endanger both satellites and astronauts. Many electrons in the radiation belts are harmless, with too little energy to do damage to human or electronic systems. But, sometimes, these electrons can catch a chorus wave, like a surfer riding a wave on Earth, and gain enough energy to become dangerous—or so researchers think.



The Radiation Belt Storm Probes are on a two-year mission to explore the Van Allen Belts. [\[more\]](#)

The Radiation Belt Storm Probes are on a mission to find out for sure.

"The production of killer electrons is a matter of much debate, and chorus waves are only one possibility," notes the Storm Probes' mission scientist Dave Sibeck.

Launched in August 2012, the two probes are orbiting inside the radiation belts, sampling electromagnetic fields, counting the number of energetic particles, and listening to plasma waves of many frequencies.

"We hope to gather enough data to solve the mystery once and for all," says Sibeck.

At the moment, the spacecraft are still undergoing their 60-day checkout phase before the main mission begins. So far, things are checking out very well.

"One of things we noticed right away is how clear the chorus sounds in the recording," notes Kletzing. That's because our data is sampled at 16 bits, the same as a CD, which has not been done before in the radiation belts. This makes the data very high quality and shows that our instrument is very, very healthy."

Eventually, Kletzing hopes to release unprecedented stereo recordings of Earth's chorus.

"We have two spacecraft with two receivers," he says, "so a stereo recording is possible."

Such a recording would not only sound wonderful, but also have real scientific value. "One of the things we don't know is how broad the region is over which chorus occurs. The widely-separated 'stereo capability' of the Storm Probes will give us the ability to figure this out," he explains.

With a two-year mission planned for the Storm Probes, the chorus is just getting started.

Author: [Dr. Tony Phillips](#) | Production editor: [Dr. Tony Phillips](#) | Credit: [Science@NASA](#)

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