

ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 59, No. 8 – August 2011

Wednesday, August 17, 2011 – General Meeting

Randall Museum . 199 Museum Way . San Francisco

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

SFAA's General Meetings take place on the 3rd Wednesday of each month (except January)

Michael Gregg, Research Astrophysicist, UC Davis
Testing What We Think We Know About The Age Of The Universe



The Hubble Space Telescope uses a traditional astronomy distance indicator, Cepheid variable stars, to measure the distance to the Coma cluster of galaxies. This reaches four times farther out into the Universe than any other precise distance measurement so far.

Michael Gregg's talk will explore how astronomers are testing our understanding of the nature of the Universe, and how we can gain insight into the age and evolution of galaxies from the visually stunning images from the Hubble Space Telescope.

Michael Gregg is a Research Astrophysicist in the Department of Physics at the University of California, Davis, but he spends most of his professional time at the Institute for Geophysics and Planetary Physics at the Lawrence Livermore National Laboratory (IGPP/LLNL). Gregg started his career investigating the stellar population of relatively nearby "S0" galaxies, showing that they may have evolved from spiral galaxies. This work spawned investigations of nearby galaxy clusters.



San Francisco Amateur Astronomers

Upcoming Lectures and Lecturers

Randall Museum Theater . Randall Museum
199 Museum Way
San Francisco

7:30 p.m. . Free & Open to the Public

September 21 -- Pascal Lee, Ph.D. – Researcher

Dr Pascal Lee is co-founder and chairman of the Mars Institute, a planetary scientist at the SETI Institute in Mountain View, CA, and the Principal Investigator of the NASA Houghton-Mars Project (HMP) at NASA Ames Research Center in Moffett Field, CA. Dr. Lee's research interests focus on Mars, asteroids and impact craters. He is particularly interested in the history of water on Mars and in the geologic and physical conditions allowing life to develop on planets.

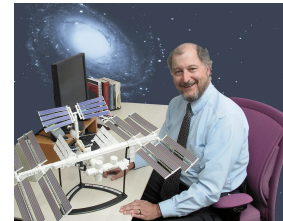
October 19 -- Dr. Natalie Batalha – Assistant Professor, Physics and Astronomy, San Jose State University

Dr. Batalha has been affiliated with NASA Ames Research Center since 2000 where she conducts research on extrasolar planet detection and stellar astrophysics. She is a co-Investigator for NASA's Kepler Mission whose objective is to identify and characterize habitable, earth-like planets orbiting sun-like stars. As Director of the Systems Teaching Institute at the NASA Research Park (<http://uarc.ucsc.edu/sti>), Dr. Batalha is responsible for creating programs and resources for students pursuing careers in fields relevant to the mission of NASA Ames Research Center.

November 16 -- PSYCHOLOGICAL ISSUES AFFECTING ASTRONAUTS IN SPACE

Dr. Nick Kanas - Emeritus Professor of Psychiatry, University of California, San Francisco

A number of psychiatric and interpersonal issues can affect astronauts in space. Professor Nick Kanas will review important psychosocial issues, describe his research with astronauts and cosmonauts who have flown on the Mir and International Space Stations, and discuss countermeasures that will improve the psychological well-being of future space travelers.



December 21 -- Erick Young, SOFIA Science Mission and Operations Director

Erick Young, a widely recognized authority on infrared astronomy, is Science Mission Operations Director for SOFIA. Most recently, Young was responsible for developing the far-infrared detector arrays on the Spitzer Space Telescope's Multiband Imaging Photometer for Spitzer (MIPS). The instrument provided both imaging and spectroscopic data at far-infrared wavelengths.

IMPORTANT DATES

SFAA GENERAL MEETINGS & LECTURES

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

Third Wednesday of each month: 7:00 p.m. Doors open. 7:30 p.m. Announcements. 8:00 p.m. Speaker

SFAA BOARD MEETINGS IMMEDIATELY PRECEDE GENERAL MEETINGS AND BEGIN AT 6:00 P.M.

August 17
September 21
October 19

November 16
December 21

CITY STAR PARTIES *Land's End (Point Lobos)*

The parking lot at Lands End is currently under construction and will be inaccessible for a few months. SFAA Public Star Party will be held at the multi-tiered parking lot just past the entrance of land's end on Geary Street. We believe the address for this parking lot is I Merry Way.

Directions:

If you are heading west on Geary (toward the Ocean), the entrance will be on your right a few hundred feet after the Lands End turn off. It is located above the Cliff House Restaurant.

Map and directions: <http://www.sfaa-astronomy.org/clubarchive/directions-pointlobos.php>

TELESCOPE CLINIC ONE HOUR BEFORE SUNSET

NOTE: While City Star Parties WILL ALWAYS be held on a Saturday, some will be close to the last quarter phase of the moon; others will be close to first quarter. This is so we can work around dates for Mt. Tam public star parties as well as our Mt. Tam members-only events.

2010 MT TAM SPECIAL USE PERMIT STAR PARTIES - MEMBERS ONLY

GATEKEEPERS NEEDED

Special Use Permit observing nights on Mount Tamalpais are private and open *only* to SFAA members. Please arrive by sunset. A permit is required for each car. We must vacate the mountain by 2:00 a.m. except on specially approved nights (such as Messier Marathon).

September 24
October 22

November 26
December 24

MT TAM PUBLIC STAR PARTIES (May through October)

Public nights on Mount Tamalpais start with a lecture in the Mountain Theatre, followed by public viewing in the Rock Springs parking lot. SFAA members may view privately after crowd departs from approx. 11 pm-2 am.

For more information: <http://www.sfaa-astronomy.org/starparties/>



2011 Mt Tam Astronomy Programs
Mt. Tamalpais State Park - Cushing Memorial Theatre (aka
the Mountain Theatre)
Explore the Wonders of the Universe

23rd series of lectures + star parties on Mt Tam.

All talks take place in the Cushing Memorial Theatre (usually just called the Mountain Theatre) and are followed by observing in the Rock Spring Parking Lot. These programs are sponsored by your state park and are FREE and open to the public. Bring your neighbors and friends for some great evenings on the Mountain. Encourage young people to come and introduce them to the experience of learning some science in a friendly setting followed by a chance to view through telescopes provided by the San Francisco Amateur Astronomers.

If you know others who may wish to receive notices of our programs send email addresses to tinkaross@comcast.net. Or send a reply to this notice if you wish to be removed from this list. Reminder notices are sent the week prior to each event and emails are not shared with anyone else.

You can learn more about our programs by checking out the web site: www.mttam.net or calling our hot line: 415-455-5370. If you still have questions or comments contact Tinka at 415-244-4715.

The schedule is listed below. **MARK YOUR CALENDARS NOW** and join us on the Mountain for some exciting Saturday nights!

- Sept 3 **Dr. Kirill Filimonov, UC Berkeley**
“Extreme Astronomy: Eyeing the Cosmos through a Cubic Kilometer of Ice”
 8:00pm Why physicists are fishing for elusive cosmic neutrinos using Ice Cube, the world’s largest telescope located on the harshest continent on the planet.
- Oct 17 **Dr. Anne Metevier, UC Santa Cruz/Sonoma State University**
“Milky Way Galaxies Across the Universe”
 7:30pm The universe contains many vast galaxies containing stars, gas and dust. What do we know about the formation and evolution of galaxies most like our own Milky Way.

Thank you for sharing this information with others.

Looking for a flashlight for the mountain? Check out Visionaryflashlights.com. Use the code astro for a 15% discount

<p>Saturday, 8/17 Noon</p> <p>SETI Institute Colloquium Series 189 Bernardo Avenue Mountain View CA 94043</p> <p>Phone: 650.961.6633</p> <p>Cost: FREE</p>	<p>THE WISE VIEW OF THE SOLAR SYSTEM Joseph Masiero, Jet Propulsion Laboratory</p> <p>The Wide-field Infrared Survey Explorer (WISE) recently completed a thermal infrared survey of the entire sky, with sensitivity nearly two orders of magnitude better than its predecessor IRAS. Simultaneously, the NEOWISE augmentation allowed for the characterization and discovery of over 150,000 Solar system objects. Dr. Masiero will present an overview of both WISE and NEOWISE, and highlight some of the interesting recent results in Solar system science to come out of this data set, including new information on the classification of asteroids.</p> <p>Email: info@seti.org Website: http://www.seti.org/csc/lectures</p>
--	---

<p>Friday, 8/19 7:00PM</p> <p>Chabot Space and Science Center 10000 Skyline Boulevard Oakland CA 94619-2450</p>	<p>TELESCOPE MAKERS' WORKSHOP</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.</p> <p>For more specific details, contact: E-mail Richard Ozer (rozer@pacbell.net) or (510) 406-1914.</p>
<p>Friday, 8/19 7:30PM</p> <p>SOLD OUT, BUT CHECK WEBSITE AT http://www.ucolick.org/public/sumvispro.html FOR ANY CHANGES</p> <p>Lick Observatory 7299 Mt. Hamilton Rd Mt. Hamilton CA 95140</p> <p>Cost: \$5</p> <p>Phone: 408-274-5061</p>	<p>SUPERMASSIVE BLACK HOLES IN NEARBY GALAXIES: THE VIEW FROM LICK OBSERVATORY - SOLD OUT Aaron Barth, UC Irvine</p> <p>Each summer, Lick Observatory hosts a Summer Visitors Program (SVP) where the public is invited to observe through both the 36-inch Great Lick Refractor and Nickel 40-inch Reflecting Telescope. Each evening also features two speakers, who present programs even if clouds or fog prohibit viewing.</p> <p>Lick astronomers present multimedia lectures on their research or topics of current interest. A "History of Lick Observatory" talk is also presented. Amateur astronomer volunteers provide additional outside viewing and informal talks.</p> <p>Program begins with the first talk at sunset. Observing begins when it gets dark and continues until everyone has had the opportunity to view through both telescopes. Because of the late hours and the need for reasonable public behavior, attendance is not advisable for most children under 8 years old.</p>
<p>Friday, 8/19 7:15-9:30PM</p> <p>Chabot Space and Science Center 10000 Skyline Boulevard Oakland CA 94619-2450</p> <p>Cost: \$7 Email: info@chabotspace.org Phone: (510) 336-7300</p>	<p>FULL MOON HIKE</p> <p>Join us for an easy three mile hike in the redwoods by twilight and full moonlight. We'll watch for Perseid meteors while we are out and learn about comets and the origin of meteor showers. The hike will be led by an experienced guide and will begin and end at Chabot. After the hike, stay and view the night sky through Chabot's telescopes (weather permitting). Hike will take place rain or shine.</p> <p>Meet at the Center at 7:15pm. The hike departs from Chabot's front entrance lobby at 7:30pm and returns at 9:30 pm.</p> <p>See event web link for tickets.</p>
<p>Friday, 8/19 and Saturday, 8/20</p> <p>Chabot Space and Science Center 10000 Skyline Boulevard Oakland CA 94619-2450 (510) 336-7300</p>	<p>EXPLORE THE NIGHT SKIES AT CHABOT OBSERVATORIES For more information: http://www.chabotspace.org/</p> <p>FREE TELESCOPE VIEWING Regular hours: 7:30pm -10:30pm Every Friday & Saturday evening, <u>weather permitting</u>. 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>DAYTIME TELESCOPE VIEWING Observatories Open 12pm - 5pm, <u>weather permitting</u>. Come view the sun, moon, or Venus through Chabot's telescopes. Free with General Admission.</p>

<p>Friday, 8/19 and Saturday, 8/20</p> <p>Chabot Space and Science Center 10000 Skyline Boulevard Oakland CA 94619-2450 (510) 336-7300</p>	<p>SKIES! 6:00 PM DINNER, A MOVIE, AND THE UNIVERSE Join us for Chabot's unique evening social rendezvous. Start your night off with dinner and drinks, then cozy up in the planetarium as you're whisked to the edge of the universe and cap off the evening with telescope viewing featuring breathtaking views of the cosmos.</p> <p>ADVANCE TICKETS DINNER: Buy advance tickets to ensure your dinner reservation. Purchase dinner separately at the cafe (\$15). A MOVIE AND THE UNIVERSE: Admission to Chabot includes access to all of our interactive exhibitions, a film in the MegaDome theater AND a show in the Digital Planetarium. Purchase your advance tickets online or call the Box Office at (510) 336-7373.</p>
<p>Friday, 8/19 9:00 - 11:00PM IF IT IS CLEAR</p> <p>Foothill Community College Observatory 12345 Moody Road Los Altos Hills</p> <p>Admission: Free</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 new 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. The choice of targets for any evening's viewing depends on the season and what objects are currently in the sky.</p> <p>On clear, dark, moonless nights, the telescopes give visitors views into the deeper reaches of space. Star clusters, nebulae, and distant galaxies provide dramatic demonstrations of the vastness of the cosmos.</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 \$2.00.</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 \$2.00.</p>
<p>Saturday, 8/20 10:00AM-12:00PM IF IT IS CLEAR</p> <p>Foothill Community College Observatory 12345 Moody Road Los Altos Hills</p> <p>Admission: Free</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.</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 \$ 2.00.</p>
<p>Saturday, 8/20 Sunset: 7:53PM</p> <p>NOTE THAT INCLEMENT WEATHER (CLOUDS, EXCESSIVE WIND AND SHOWERS) WILL CAUSE THE EVENT TO BE CANCELED WITHOUT NOTICE</p> <p>San Mateo County</p>	<p>STAR PARTIES AT CRESTVIEW PARK, SAN CARLOS Come out and bring the kids for a mind expanding look at the universe The City of San Carlos Parks and Recreation Department and the San Mateo County Astronomical Society has open Star Parties twice a month. These events are held in Crestview Park, San Carlos California.</p> <p>For more information call Bob Black, (650)592-2166, or send an email to SMCAS@live.com or call Ed Pieret at (650)862-9602.</p> <p>Reasons to Attend If you have kids interested in space or planets bring them here for a real life view of planets, nebula, star</p>

<p>Astronomical Society Star Party</p> <p>Crestview Park San Carlos</p>	<p>clusters and galaxies. If you are thinking of buying a telescope or want help using a telescope you own, come here to talk with experienced users. If you think you might have an interest in astronomy come and talk to experienced amateur astronomers.</p> <p>Cautions Dress warmly and wear a hat. Visitors should park on the street and walk into the park so your headlights don't affect the observer's dark adaptation. Only park in the parking lot if you are arriving before dark and plan to stay until the end of the event. You shouldn't need lights but if you feel you do, only bring a small flashlight with the lens covered using red cellophane or red balloon. Please respect the telescopes and ask permission from the owner if you wish to touch. Parents, please watch your children. The park is residential, and adjacent to homes and backyards, please keep noise to a minimum. Schedule/Time - Astronomers arrive to set up at around sunset. Observing starts at about one hour after sunset and continues for two to three hours.</p>
<p>Saturday, 8/20 7:30PM</p> <p>Lick Observatory 7299 Mt. Hamilton Road Mt. Hamilton CA 95140</p> <p>Cost: \$35-\$150 Email: giftshop@ucolick.org Phone: 408-274-5061 Website -- http://www.ucolick.org/public/sumvispro.html</p> <p>Phone: 408-274-5061 Call ahead for information</p>	<p>MUSIC OF THE SPHERES: TWO VIEWS OF THE MOON Each summer Lick Observatory hosts the Music of the Spheres concert series. Program for each includes the concert, a talk by a University of California astronomer about current research and, weather permitting, viewing with the historic 36-inch Great Lick Refractor and the Nickel 40-inch telescope. A knowledgeable group of local amateur astronomer volunteers provide additional viewing of the sky and informal discussion of astronomy.</p> <p>Explore the beautiful music of the Andes. Chaskinakuy (pronounced "Chas- kee- NA- kwee") means "to give and receive, from hand to hand, among many." Trio Chaskinakuy lives up to its name, performing a variety of indigenous music from the remote mountain villages of Peru, Ecuador, Argentina, Northern Chile, and Bolivia.</p> <p>Co-founders Francy Vidal and Edmond Badoux have performed music of the Andes across the continents; Daniel Zamalloa from Peru is considered the expert on violin music from his native village. Enjoy the sound of museum-quality regional wind, string, and percussive instruments, as the trio brings sounds of the Andean mountaintops to Mt. Hamilton.</p> <p>Speaker: Alex Filippenko, UC Berkeley</p>
<p>Saturday, 8/20 07:30 PM - 12:30 AM</p> <p>Mount Diablo Lower Summit Parking Lot Summit Road Clayton, CA 94517</p> <p>Cost: Free</p>	<p>THE SEARCH FOR ANOTHER EARTH Why does Earth have abundant life, but nowhere else in our Solar System? How many planets like Earth might be out there in our Galaxy? ? Take home a star map of other stars with planets.</p>

<p>Saturday, 8/20 9:00PM 09:00 PM - 11:00 PM</p> <p>Lawrence Hall of Science 1 Centennial Drive Berkeley, CA 94720 USA</p> <p>Cost: FREE</p>	<p>SATURDAY NIGHT STARGAZING See the Moon, Planets, Stars, Galaxies and More</p> <ul style="list-style-type: none"> * Stargaze through astronomical telescopes * Ask questions and talk with amateur astronomers * Learn how to use a star map to find constellations * Share in the wonder of the universe with your friends <p>Stargazing is always weather permitting-be sure to dress warmly. Foggy and overcast skies can cancel stargazing at the last minute.</p> <p>Saturday Night Stargazing is a free public viewing program sponsored by the Hall and Bay Area amateur astronomers. Stargazing is always weather permitting, so dress warmly. Foggy and overcast skies can cancel stargazing at the last minute. For more information, join the LHS Stargazing Google Group, follow us on Twitter@lhsstargazing, and visit our Google Site.</p>
<p>Friday-Tuesday 10/28 – 11/1</p> <p>Kitt Peak National Observatory Tucson AZ</p> <p>http://www.webari.com/oldscope/</p>	<p>Antique Telescope Society meeting/Tour of Kitt Peak National Observatory in AZ</p> <p>These are great tours where one gets to see the inner workings of great professional and public astronomical observatories as well as hear neat lectures. This one will be nearby in AZ. Highly recommended! Check out their web site.</p> <p>http://www.webari.com/oldscope/</p> <p>On October 28 through Nov. 1, 2011, the Antique Telescope Society will hold its 20th Annual Convention in Tucson, AZ, with optional tours planned for the two following days. One of the highlights will occur on Saturday, October 29, when we will take a VIP tour of Kitt Peak during the day and have optional observing on Kitt Peak during the evening. In addition, the program includes a reception on Friday evening and a banquet on Sunday which will feature a keynote address. The Convention will also have talks and exhibits. A tour of Steward Mirror Laboratory is planned for Friday, a tour of the Whipple Observatory on Mount Hopkins will be held on Monday, and a tour of Mount Graham International Observatory and its Large Binocular Telescope is planned for Tuesday. While in Tucson, the Four Points Sheraton Hotel University Plaza will serve as our headquarters. We look forward to welcoming ATS members and friends to Tucson. Please join us.</p> <p>Ken Launie, Convention Co-Chairman and President Peter Abrahams, Convention Co-Chairman and Paper Sessions Chairman Jack Koester, Treasurer Walter H. Breyer, Executive Secretary</p>

NASA WHAT'S UP PODCAST FOR AUGUST – BY JANE HOUSTON JONES

What's Up for August

<http://www.nasa.gov/multimedia/podcasting/whatsup20100802.htm> |

August 5 Launch of Juno - on its way to Jupiter

Sunday, August 14, 2011 10:42 AM

From:

"Jane Houston Jones" <jane@whiteoaks.com>

[View contact details](#)

To:

"AANC Contacts" <contacts@aanc-astronomy.org>

I just returned from working at the launch of JPL's Juno spacecraft - now on its way to Jupiter on solar powered wings.

Here's my story and pictures and Mojo's too! We each saw the launch from different eyes. We have been watching United Launch Alliance's awesome launch videos with lovely music over and over all day long!

<http://jane.whiteoaks.com/2011/08/14/mission-juno-launch-august-5-2011/>

<http://mojo.whiteoaks.com/2011/08/11/the-nasa-tweetup-to-launch-juno/>

Those great ULA launch videos are here, by the way: <http://www.youtube.com/user/UnitedLaunchAlliance> (rocket on!)

Jane and Mojo - see some of you at Glacier Point in a couple weeks!

-- Jane Houston Jones

Monrovia, CA

My What's Up Podcast-August: Windy Worlds and Juno Launch

NASA podcast: <http://is.gd/bSXeAl>

Youtube site: <http://is.gd/kPUtSx>

Twitter: <http://twitter.com/jhjones> /CassiniSaturn /otastro

My Blog about Juno Launch: <http://jane.whiteoaks.com/>

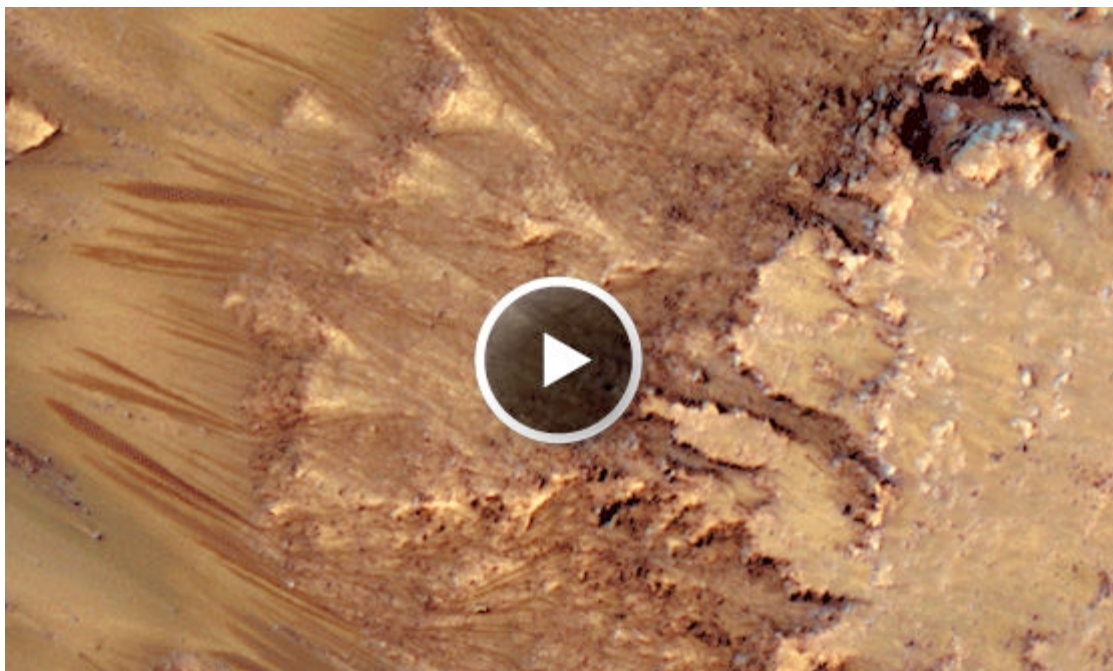
NASA SCIENCE NEWS

The Science@NASA team is pleased to announce a new product: the ScienceCast. Every week, we produce a short video highlighting a topic in NASA science news. This week's episode is about the night sky. Check out "Spring is Fireball Season" on Youtube: <http://www.youtube.com/watch?v=ssMdlTbvHjk>
A complete list of ScienceCast episodes may be found on Science@NASA's Youtube channel: <http://www.youtube.com/user/ScienceAtNASA> . Enjoy!

SALT WATER MAY FLOW ON MARS

August 4, 2011: Observations from NASA's Mars Reconnaissance Orbiter have revealed possible flowing water during the warmest months on Mars.

Dark, finger-like features appear and extend down some Martian slopes during late spring through summer, fade in winter, and return during the next spring. Repeated observations have tracked the seasonal changes in these recurring features on several steep slopes in the middle latitudes of Mars' southern hemisphere.



"The best explanation for these observations so far is the flow of briny water," said Alfred McEwen of the University of Arizona, Tucson. McEwen is the principal investigator for the orbiter's High Resolution Imaging Science Experiment (HiRISE) and lead author of a report about the recurring flows published in Thursday's edition of the journal Science.

Click to view a movie of features that might be

evidence of salty liquid water active on Mars today. Evidence for that possible interpretation is presented in a report by McEwen et al. in the Aug. 5, 2011, edition of Science. [\[movie\]](#)

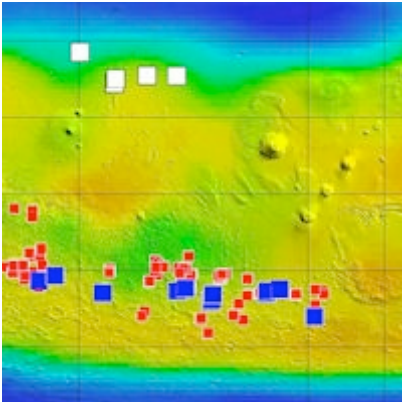
Some aspects of the observations still puzzle researchers, but flows of liquid brine fit the features' characteristics better than alternate hypotheses. Saltiness lowers the freezing temperature of water. Sites with active flows get warm enough, even in the shallow subsurface, to sustain liquid water that is about as salty as Earth's oceans, while pure water would freeze at the observed temperatures.

"These dark lineations are different from other types of features on Martian slopes," said Mars Reconnaissance Orbiter Project Scientist Richard Zurek of NASA's Jet Propulsion Laboratory in Pasadena, Calif. "Repeated observations show they extend ever farther downhill with time during the warm season."



The features imaged are only about 0.5 to 5 yards or meters wide, with lengths up to hundreds of yards. The width is much narrower than previously reported gullies on Martian slopes. However, some of those locations display more than 1,000 individual flows. Also, while gullies are abundant on cold, pole-facing slopes, these dark flows are on warmer, equator-facing slopes.

The images show flows lengthen and darken on rocky equator-facing slopes from late spring to early fall. The seasonality, latitude distribution and brightness changes suggest a volatile material is involved, but there is no direct detection of one. The settings are too



warm for carbon-dioxide frost and, at some sites, too cold for pure water. This suggests the action of brines, which have lower freezing points. Salt deposits over much of Mars indicate brines were abundant in Mars' past. These recent observations suggest brines still may form near the surface today in limited times and places.

When researchers checked flow-marked slopes with the orbiter's Compact Reconnaissance Imaging Spectrometer for Mars (CRISM), no sign of water appeared. The features may quickly dry on the surface or could be shallow subsurface flows.

Blue squares on this map of Mars mark the locations of possible briny-flow features. [\[more\]](#)

"The flows are not dark because of being wet," McEwen said. "They are dark for some other reason."

A flow initiated by briny water could rearrange grains or change surface roughness in a way that darkens the appearance. How the features brighten again when temperatures drop is harder to explain.

"It's a mystery now, but I think it's a solvable mystery with further observations and laboratory experiments," McEwen said.

These results are the closest scientists have come to finding evidence of liquid water on the planet's surface today. Frozen water, however has been detected near the surface in many middle to high-latitude regions. Fresh-looking gullies suggest slope movements in geologically recent times, perhaps aided by water. Purported droplets of brine also appeared on struts of the Phoenix Mars Lander. If further study of the recurring dark flows supports evidence of brines, these could be the first known Martian locations with liquid water.

"NASA's Mars Exploration Program keeps bringing us closer to determining whether the Red Planet could harbor life in some form," NASA Administrator Charles Bolden said, "and it reaffirms Mars as an important future destination for human exploration."

For more information about the Mars Reconnaissance Orbiter, visit: <http://www.nasa.gov/mro> and <http://marsprogram.jpl.nasa.gov/mro/> .

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

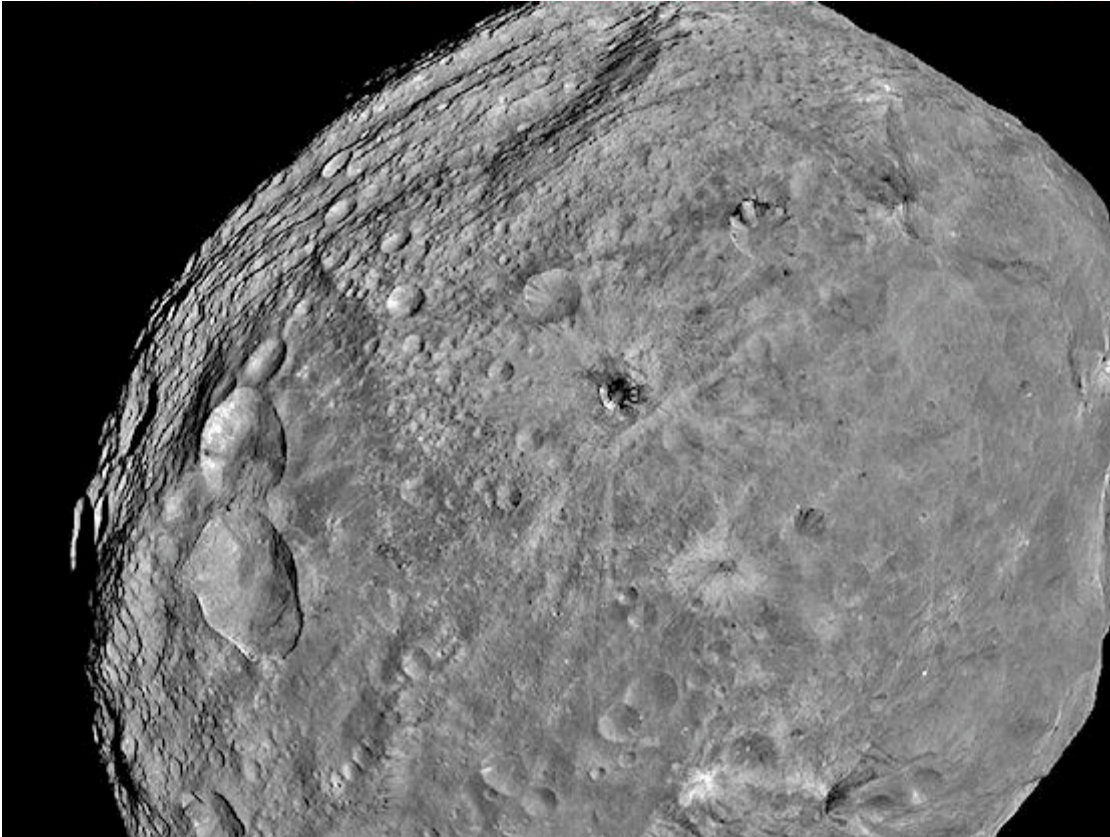
More Information

Credits: The Mars Reconnaissance Orbiter is managed by JPL for NASA's Science Mission Directorate in Washington. The University of Arizona's Lunar and Planetary Laboratory operates HiRISE. The camera was built by Ball Aerospace & Technologies Corp. in Boulder, Colo. Johns Hopkins University Applied Physics Laboratory in Laurel, Md., provided and operates CRISM. JPL is a division of the California Institute of Technology in Pasadena.

DAWN'S SMOOTH MOVE

August 1, 2011: When a NASA spacecraft goes into orbit around a new world for the first time, the control room is usually packed

to capacity with scientists, engineers, and dignitaries ready to leap and shout when the retro-rockets fire. It's a big, noisy event.



July 15, 2011, was one of those days. NASA's Dawn spacecraft approached Vesta and became the first probe from Earth to orbit a main belt asteroid. Dawn's cameras revealed a desolate world of transcendent beauty, thrilling everyone who worked on the project.

Needless to say, the control room was *silent?*

"Actually it was empty," says Dawn Chief Engineer Marc Rayman of JPL. "Dawn entered orbit on a Friday night; I myself was out dancing with my wife and friends."

Using its framing camera, Dawn obtained this image of Vesta on July 24, 2011, from a distance of about 3,200 miles (5,200 kilometers). The three vertically-aligned craters on the left have been nicknamed "the snowman" by camera team members. **Press release:** [Dawn Begins Science Orbits of Vesta](#).

What gives? Rayman, an avid folk dancer, explains: "Our mission has a unique choreography."

Indeed, Dawn has its own way of doing things. While most spacecraft blast off Earth atop a firestorm of conventional rocket exhaust, then coast to their destinations with engines turned off to conserve fuel, Dawn was able to continue thrusting throughout its voyage. Fuel-efficient ion engines gently propelled the spacecraft toward Vesta for more than three years, never exerting more force than the weight of a feather held in your open palm yet, over time, gathering enough speed to catch an asteroid racing halfway across the solar system.

With engines firing almost constantly, mission controllers were able to actively steer the probe, gradually reshaping Dawn's orbit around the sun until it matched the orbit of Vesta itself. Meeting Vesta for orbital insertion wasn't a jarring encounter of mismatched velocities. It was more like two dancers merging in practiced rhythm to a familiar tune.



"Dawn did not miss a beat as it flew into Vesta's grasp," says Rayman. "The spacecraft moved gently into orbit with the same grace it has displayed during its nearly 1000 days of ion propulsion through the solar system."

The capture was so smooth, so low-key, that personnel felt no particular need to monitor the probe's operation. "I really was out dancing," says Rayman, "confident that the pas de deux being performed 188 million kilometers away would be executed with graceful beauty and flawless precision."

Calculations show that the moment of "orbit insertion" occurred on Friday night, July 15th, around 9:47 pm PDT. At that moment, Dawn's orbit around the sun finally was so close to that of Vesta that the protoplanet's gravity could take hold of it. Radio signals picked up on schedule by the Deep Space Network later confirmed that the spaceship and asteroid were truly a pair.

Dawn will spend the next year circling Vesta in a series of descending passes, bringing the giant asteroid's ancient surface ever closer to Dawn's cameras and other science instruments. Because Vesta is a relic of long-ago planet formation, the history of our solar system could be revealed under Dawn's careful scrutiny.

"This really beautiful dance," says Rayman, "is just getting started."

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

More Information

[Dawn](#) -- JPL home page

[Dawn](#) --- NASA HQ home page

[Dawn Spacecraft Begins Science Orbits of Vesta](#)

Credits: Dawn launched in September 2007. Following a year at Vesta, the spacecraft will depart in July 2012 for Ceres, where it will arrive in 2015. Dawn's mission to Vesta and Ceres is managed by JPL for NASA's Science Mission Directorate in Washington. JPL is a division of the California Institute of Technology in Pasadena. Dawn is a project of the directorate's Discovery Program, managed by NASA's Marshall Space Flight Center in Huntsville, Ala. UCLA is responsible for overall Dawn mission science. Orbital Sciences Corp. in Dulles, Va., designed and built the spacecraft. The German Aerospace Center, the Max Planck Institute for Solar System Research, the Italian Space Agency and the Italian National Astrophysical Institute are international partners on the mission team.

2010 CLUB OFFICERS & CONTACTS

President	SUE-ELLEN SPEIGHT	sfaapresident@sfaa-astronomy.org
Vice President	Vivian White	vicepresident@sfaa-astronomy.org
Secretary	Douglas Smith	
Treasurer	Bob Haberman	treasurer1@sfaa-astronomy.org
	Angie Traeger	angietraeger@gmail.com
Speaker Chair	Linda Mahan	speakerchair@sfaa-astronomy.org
City Star Party	David Frey	csp@sfaa-astronomy.org
Bulletin Editor	Annette Gabrielli	editor@sfaa-astronomy.org
Telescope Loans	Pete Goldie	telescopes@sfaa-astronomy.org
Honorary Director and Board Member Emeritus	John Dobson	
Board Members	Doug Smith	
	Dave Frey	
	Joe Heavey	joe@sfrjupiter.com
	Dean Gustavson	deangustavsonartist@gmail.com
	Elan Morpurgo	elan@sfaa-astronomy.org 415 383-2247
	Doug Smith	
	Matthew Jones	sfaa@strider.com
	Anil Chopra	
	Schoenbrun	webmaster@sfaa-astronomy.org
1 st Alternate	Chris Coffin	wbmstr@sfaa-astronomy.org
2 nd Alternate	Dave Goggin	daveg@SFAA-Astronomy.org
Webmaster	Mitchell Schoenbrun Matthew Jones	wbmstr@sfaa-astronomy.org

CLUB TELESCOPES

The SFAA owns eight very fine, easy to use, loaner telescopes well-suited for deep sky, planets, and star parties. All scopes are available to any SFAA member. The loaner custodians for the majority of our fleet are Pete & Sarah Goldie. Please contact them at telescopes@sfaa-astronomy.org for details if you are interested in borrowing a scope or if you have items you can donate for the loaner program (eyepieces, star maps/books, red flashlights, collimator, etc.). Please contact the appropriate member indicated below if you are interested in borrowing one of the telescopes.

- 1) 6" f/10.3 Dobsonian/Ken Frank ken@sfaa-astronomy.org
- 2) 8" f/7 Dobsonian/Pete Goldie
- 3) 8.5" f/6 Dobsonian/Pete Goldie
- 4) 10" f/8 Dobsonian/Pete Goldie
- 5) 114mm f/4 Newtonian StarBlast/Pete Goldie
- 6) 8" f/10 Celestron SCT/Annette Gabrielli/ annette@sfaa-astronomy.org
- 7) 8" f/10 Meade SCT/Stefanie Ulrey/treasurer@sfaa-astronomy.org
- 8) 9.5" f/5.6 Celestron Newtonian/Ken Frank/ ken@sfaa-astronomy.org

CLUB ASTRONOMY VIDEOS

The SFAA owns a series of astronomy videotapes featuring Alex Filippenko, a world-renowned professor of astronomy at UC Berkeley. The videotapes provide an introduction to astronomy and cover topics such as the Solar System, the lifecycles of stars, the nature of galaxies, and the birth of the Universe. The SFAA loans the tapes free to all members. If you are interested in viewing these tapes, you may check them out at any of the SFAA General Meetings. These tapes were kindly donated to the SFAA by Bert Katzung. For information on the course tapes themselves:

<http://www.teach12.com/ttc/assets/coursedescriptions/180.asp>

MEMBERSHIP DUES

Membership is billed for each upcoming year on June 30. Members may receive no more than one bulletin after the expiration of membership.

SFAA WEBSITE AND ONLINE SERVICES

The SFAA web site at sfaa-astronomy.org is provided to our members and the general public for the sharing of club information and services. The web site contains links for club [star parties](#), [events](#), [newsletters](#), [lectures](#) and [meetings](#). If you wish to interact with other people who are interested in astronomy, the SFAA web site offers public and members only [bulletin board forums](#). If you wish to remain up-to-date on club activities, then we encourage you to subscribe to one or both of our public [mailing lists](#), which will allow you to receive our newsletter and/or club announcements via email. Other useful and interesting information and services are available on the site such as [observing location reviews](#), member [astronomy photos](#), and [members only telescope loans](#). Information about SFAA's membership, organization and by-laws are available at the club's online public document [archive](#). If you need to contact a representative of the SFAA, then please visit our [contacts](#) page to help in finding the right person to answer your questions.

Above the Fog is the official bulletin of the San Francisco Amateur Astronomers. It is the forum in which club members may share their experiences, ideas, and observations. We encourage you to participate by submitting your articles, announcements, letters, photos and drawings. We would also like to hear from our new members. Tell us about yourself – what you have done in the past and what other clubs you have joined. **The deadline for the next issue is the 25th day of the month.** Send your articles to Editor@sfaa-astronomy.org