

ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 57, No. 6 – June 2009

Wednesday, June 17, 2009 – General Meeting

Randall Museum . 199 Museum Way . San Francisco

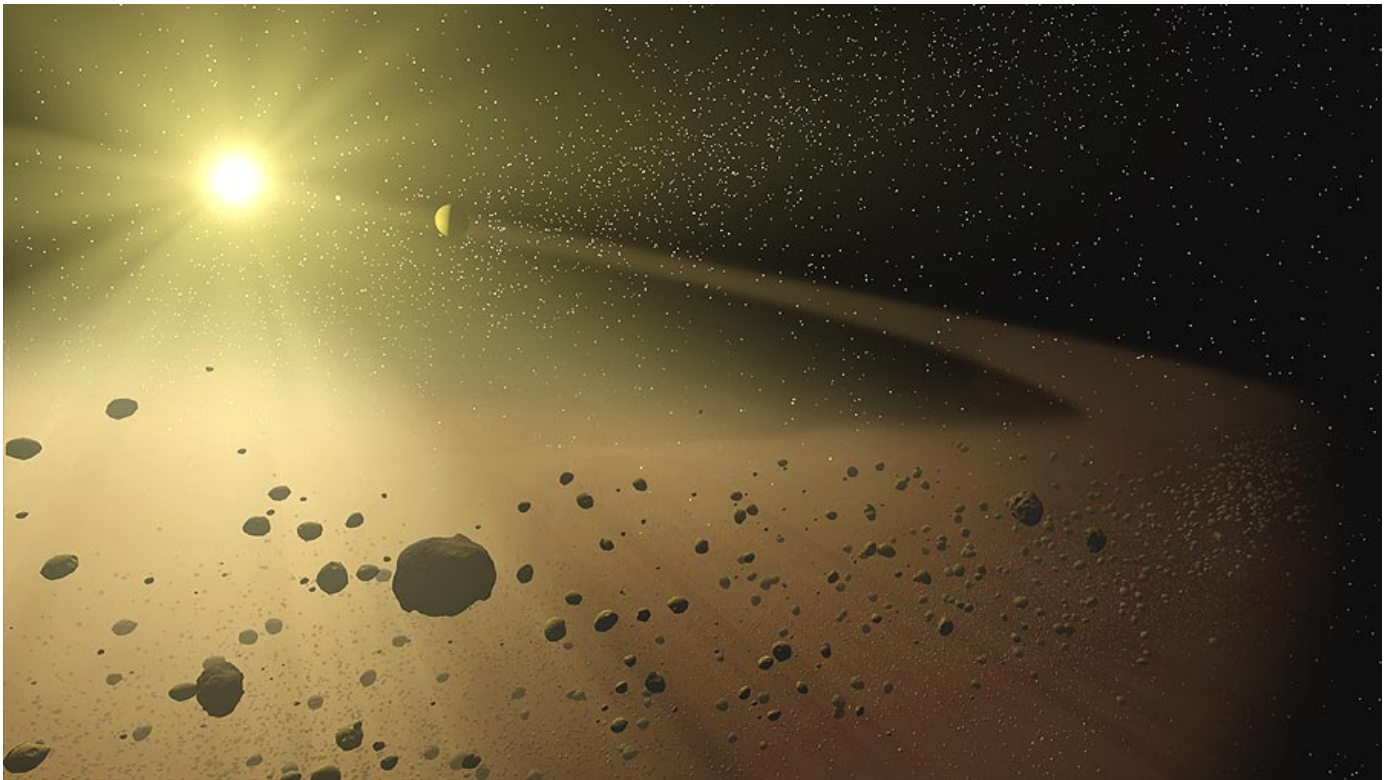
7:00 pm Doors Open . 7:30 pm Announcements . 8:00 pm Speaker

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

DR. DANA BACKMAN

Stratospheric Observatory for Infrared Astronomy (SOFIA), SETI Institute

**SPITZER OBSERVATIONS OF EPSILON ERIDANI'S DEBRIS DISK:
SIGNS OF A PLANETARY SYSTEM**



Some stars are surrounded by rings and disks of material that are probably remnants of the planet formation processes. These so-called "debris disks" resemble the Kuiper Belt of icy objects orbiting beyond Neptune in our solar system. Observations of the debris disk around the nearby solar-type star epsilon Eridani will be described, especially including results from the Spitzer infrared space observatory. These observations show signs of the gravitational influence of large planets on the disk.

Dr. Backman is a native of Hartford, Connecticut, who received his bachelor's degree in physics from MIT and Ph.D. in astrophysics from the University of Hawai'i. Infrared astronomy post-doctoral researcher at Kitt Peak National Observatory in Tucson, Arizona, and at NASA-Ames in Mountain View, California. Professor of physics and astronomy for 12 years at Franklin and Marshall College in Lancaster, Pennsylvania. Since 2003, employed by the SETI Institute as director of education and public outreach for NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA). Teaches introductory astronomy courses at Santa Clara University and in Stanford University's Continuing Studies Program. Co-author with Michael Seeds of three college introductory astronomy textbooks, "Perspectives", "Horizons" and "Foundations".

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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 20th day of the month.** Send your articles to Editor@sfaa-astronomy.org

IMPORTANT DATES

SFAA GENERAL MEETINGS & LECTURES - JUNE 17 . JULY 15 . AUGUST 19

*Third Wednesday of each month: 7:00 p.m. Doors open. 7:30 p.m. Announcements. 8:00 p.m. Speaker
Randall Museum, 199 Museum Way (Near 14th Street and Roosevelt)*

SFAA BOARD MEETINGS - JUNE 9 . JULY 14 . AUGUST 11

*Second Tuesday of each month: 7:00 p.m. – 8:30 p.m.
Randall Museum, 199 Museum Way (Near 14th Street and Roosevelt)*

CITY STAR PARTIES - (NO JUNE DATE) . JULY 11/8:30 P.M. . AUGUST 29/7:30 P.M. **TELESCOPE CLINIC ONE HOUR BEFORE SUNSET**

Land's End (Point Lobos) - Map and directions:

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

NOTE: While City Star Parties WILL ALWAYS be held on Saturdays, 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.

MT TAM SPECIAL USE PERMIT STAR PARTIES - MEMBERS ONLY

JUNE 20 . JULY 18 . AUGUST 15

Special Use Permit observing nights on Mount Tamalpais are private and open *only* to SFAA members. Please arrive by sunset (times listed below). 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).

MT TAM PUBLIC STAR PARTIES - JUNE 27/8:36 P.M. . JULY 25/8:24 P.M. . AUGUST 22/7:53 P.M.

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 go here: <http://www.sfaa-astronomy.org/starparties/>

UPCOMING GUEST SPEAKERS

July 15 - Eugene Chiang, Associate Professor of Astronomy and Earth & Planetary Science, UC Berkeley

THE TENTH PLANET AND BEYOND

We will describe the chain of scientific discoveries that have allowed us to address these questions for the first time, and conclude by examining the incredible prospect that we may have glimpsed first light from a newly formed extrasolar planet interacting with its own primitive Kuiper belt."



R A N D A L L
M U S E U M

**Tuesday
June 30, 2009
5:30 pm – 7:00 pm
Randall Museum**

Please help us celebrate the amazing 40 years of service John Dillon provided the Randall Museum. As Science Curator and Acting Museum Director John developed many programs, secured the services of world-renowned instructors and speakers, and provided wise council and good humor to his many colleagues and associates.

Light hors d'oeuvres and refreshments will be served.

Annual SFAA NIGHT

Fremont Peak Observatory

June 26-27, 2009

Some previous years photos: [05](#) [06](#) [07](#) [08](#)



Courtesy of [Art Rosch](#)

Each year for the past few years the FPOA has graciously granted us use of their 30 inch telescope for a Friday. In exchange, we do a public program the following day and night as a thank you. We have reserved the Observatory Friday, June 26th evening for an exclusive private gathering of members from the SFAA.

Wanna come? It's open to all current dues paying [members](#) of SFAA. Please [email](#) your license plate # of your car, and if you're bringing a scope the type and size like you do for Yosemite. [Here's](#) who has signed up so far. (The X in front of the name means confirmed. Those without the X are placeholders for me).

The Fremont Peak Observatory features a fine [30-inch f/4.8 Newtonian telescope](#) built by Kevin Medlock of the [Eastbay Astronomical Society](#). The telescope is mounted on an English cross-axis equatorial system. There are also 6 powered observing pads outside the observatory, where visiting astronomers (like SFAAer [Richard Crisp](#)) can set up to observe in Fremont Peak's dark skies. From [March through October](#), Fremont Peak Observatory conducts programs for the public at least three Saturday evenings a month, excluding the Saturday closest to full moon.

[Fremont Peak State Park](#) is about 100 miles south of San Francisco, and eleven miles south east of the town of San Juan Bautista. The park features camping facilities which are available either by [reservation](#) or first come first served basis. Please be sure and pay the day or or if camping the overnight fee in the green box by the public phone. At the bottom of the hill in San Juan Bautista is the [San Juan Inn](#) for those who would like more civilized overnight amenities.

Doug Brown, President of FPOA, noted that Fremont Peak has long been popular as a nearby dark sky observing and astrophotography site with a excellent southern horizons, and is even mentioned as a stopping place on page 50 of the May-June 2005 issue of AAA's Via Magazine! If you're interested, contact [Doug](#).

Dr. Doris Sloan, an FPOA member wrote an article in Bay Nature Magazine about Fremont Peak. Coincidentally the [April-June 08 article](#) is embellished with our own Michael Kran's photos as well!

For SFAA members wanting to enjoy this gorgeous telescope on their own, practically whenever they choose (with a few exceptions) and you're interested in joining FPOA Those interested in joining FPOA can learn about the benefits of membership and [download an application form](#).

Also, if you'd like to participate in a great social activity with the FPOA folks, they are having their Star B Q in conjunction with the [AANC](#) on Saturday July 25th; please note: it's the same weekend as our Yosemite Star Party. Hey, great minds think alike. It's the best New Moon weekend of the summer. However, please do let [Doug Brown](#) know if you're interested in coming.. The Fremont Peak Star B Q is always fun and sure to please. The Peak is also 3 hours closer.

For more information about Fremont Peak Observatory, including excellent directions to Fremont Peak State Park and the Observatory, visit their web site at <http://www.fpoa.net>

Looking forward to seeing you again this year, Ken

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UC Berkeley, Astronomy Department
INTERNATIONAL YEAR OF ASTRONOMY
PUBLIC TALKS

Saturday, June 20, at 11 a.m. - 12:00 Noon
100 Genetics & Plant Biology Building
ALEX V. FILIPPENKO
Professor of Astronomy
Dark Energy and the Runaway Universe

Alex Filippenko, 2006 "National Professor of the Year", gives a public talk about exploding stars, and how they can be used to trace the accelerating expansion of the fabric of spacetime.

Observations of very distant exploding stars (supernovae) show that the expansion of the Universe is now speeding up, rather than slowing down due to gravity as expected. Other, completely independent data strongly support this amazing conclusion. Over the largest distances, our Universe seems to be dominated by a repulsive "dark energy" --- an idea Einstein had suggested in 1917, but renounced in 1929, anecdotally as his "biggest blunder." Dark energy stretches the very fabric of space itself faster and faster with time. But the physical origin of dark energy is unknown, and is often considered to be the most important unsolved problem in physics; it probably provides clues to a unified quantum theory of gravity.

Alex Filippenko joined the UC Berkeley faculty in 1986, where he is a leading authority on exploding stars, active galaxies, black holes, gamma-ray bursts, and the expansion of the Universe. Recently elected to the National Academy of Sciences and one of the world's most highly cited astronomers, he is the recipient of numerous prizes for his research. He was a member of both teams that discovered the accelerating expansion of the Universe; this was named the "Top Science Breakthrough of 1998" by Science magazine, and the teams received the 2007 Gruber Cosmology Prize for their discovery. An extraordinary educator, Dr. Filippenko has won the highest teaching awards at UC Berkeley, where the student body has voted him the "Best Professor" on campus six times, and he was selected as the 2006 Carnegie/CASE National Professor of the Year among doctoral institutions. He has appeared in numerous television documentaries, produced several introductory astronomy video courses with The Teaching Company, and coauthored an award-winning textbook.

Schedule of Monthly Talks

Date	Venue	Speaker	Topic
July 18	100 GPB	Roger Hahn	A Troublesome Pioneer: Galileo Galilei
August 15	100 GPB	David Lindberg and Steve Croft	Astronomy and Evolution: From the Death of the Dinosaurs to the Stardust in your Bones
September 19 October 17 November 21	100 GPB	Nathan Smith	Live Fast - Die Young: Monster Stars and their Temper Tantrums
	100 GPB	Imke de Pater	Fascinating Objects in our Solar System
	100 GPB	Maryam Modjaz	Cosmic Fireworks: The Explosive Deaths of Massive Stars
December 19	TBA	Dick Plambeck	Star Formation through Radio Eyes

Jim Cottle



On May 18th 1969, Apollo 10 was launched from Kennedy Space Center pad 39B putting the last pieces of puzzle in place for Apollo 11's July 20th lunar landing.

Meanwhile, or rather several weeks later on July 3rd, halfway around the globe and in total secrecy, the USSR launched its second N1 moon rocket, vehicle 5L, from Baikonur Cosmodrome. As the rocket reached an altitude of 600 ft, only twice the length of the stack, all thirty first-stage engines shut down due to an oxidizer pump failure. This was the ultimate catastrophic failure, a complete first stage loss of thrust in a fully fueled moon rocket, which also horrified the von Braun Saturn 5 team the most. As the huge N1 collapsed back onto the pad, in a spectacular explosion, it sent seismic shock waves around the world as it destroyed itself, the surrounding pad support facilities and any hopes of the USSR reaching the moon ahead of the US. CIA seismographs picked up the explosion and, with forensic analysis of Baikonur obituaries, pieced together the 2 year set back to the Soviet Space Program and few in the west knew just how close the United States was with the Soviets in the high-stakes cold war game called "first man on the moon."

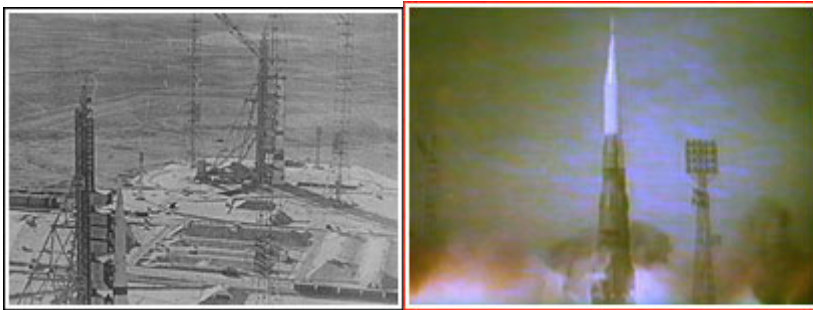


Figure 1 – a) two Soviet N1 Moon Rockets at site 110 left and right of the Baikonur Cosmodrome in late 1968 and b) actual launch photo of a Soviet N1.

Apollo 10 was the last in a series of high choreographed, meticulous steps toward the ultimate goal of NASA landing a man on the moon before the end of 1969. Partly of necessity, due to the complex nature of the lunar module and the availability of flight hardware, these steps had been modified when necessary in a very creative way by NASA management to accomplish the end feat with upmost efficiency, based on what was available. This is part of the legacy of the Apollo era and a testimonial to the dedication of thousands of industrial, government and university workers across America working in synchronization for a common goal. Apollo 10 would be a full dress rehearsal of the lunar landing mission, flying down to 47,000 feet above the lunar surface, the point at which the final descent stage of flight would begin on Apollo 11. The crew of Apollo 10 must have been tempted...so close, but their discipline, training and teamwork contributions to the program were also part of Apollo's legacy. At 47,000 feet, mission plans called for separation of the ascent stage from the descent stage and a re-rendezvous with the command module. The crew had affectionately designated call signs for the command and lunar modules as Charlie Brown and Snoopy, respectively, after the popular Peanuts comic strip of Charles Schultz.



Figure 2- Saturn 505, AS-505, ready for the Apollo 10 payload in high bay 2 of the Vertical Assembly Building at Kennedy

The altitude at which the missions of Apollo 10 and Apollo 11 would differ was chosen, not arbitrarily, but because of several practical constraints. At 47,000 feet, the Lunar Module of Apollo 11 would begin its final descent burn, activate its landing radar and be poised for further reduction in altitude. 47,000 feet above the surface was also chosen so that, if Snoopy got into serious trouble, the command module Charlie Brown, could fly to its rescue. This almost occurred on the mission.

At or near the 47,000 feet altitude point, one of the two astronauts mis-set a switch in the Lunar Module accidentally activating the abort guidance system radar. “Sonofobitch!” yelled Gene Cernan as Snoopy violently oscillated back and forth searching for a lock on the command module. Tom Stafford took manual control of the module before the guidance system locked up and managed to avert an error that, must have seemed at the time as near catastrophic. It turns out that this error was the only real serious issue of the mission.

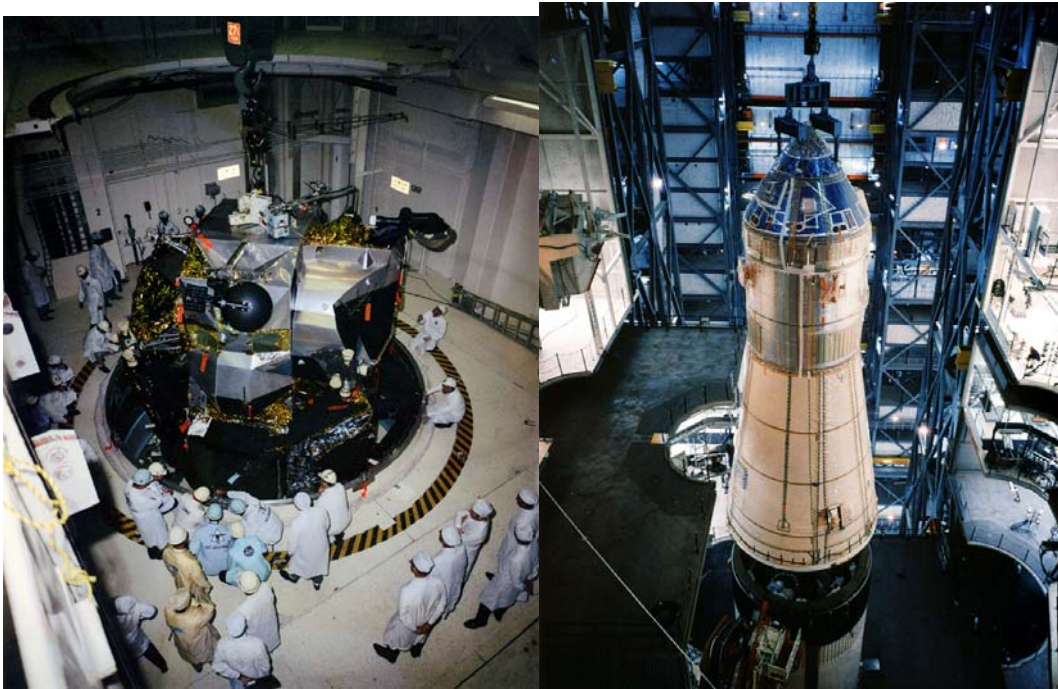


Figure 3 – Mating Snoopy, Lunar Module 4 (LM-4), and Charlie Brown, CSM-106, to the third stage of AS-505 at or about the 300 foot point in the VAB high bay.

Owen Maynard, who coined the A, B, C, etc. series of moon missions had not originally accounted for Apollo 10's "F" mission in his original schedule. It was not originally thought necessary, but in retrospect, as well as in the minds of the Flight Operations Directorate of NASA, flying the Lunar Module down to 47,000 feet was, in itself, a big enough job to master. Apollo 10 managed this, good solid rendezvous with the command module and predictable results for the rest of the mission goals.



Figure 4 – a) Command Module as seen from Snoopy, b) beginning the descent and c) the ascent stage upon return approach.

Apollo 10 also brought back some really fantastic lunar surface photographs and I have included a couple of these below.

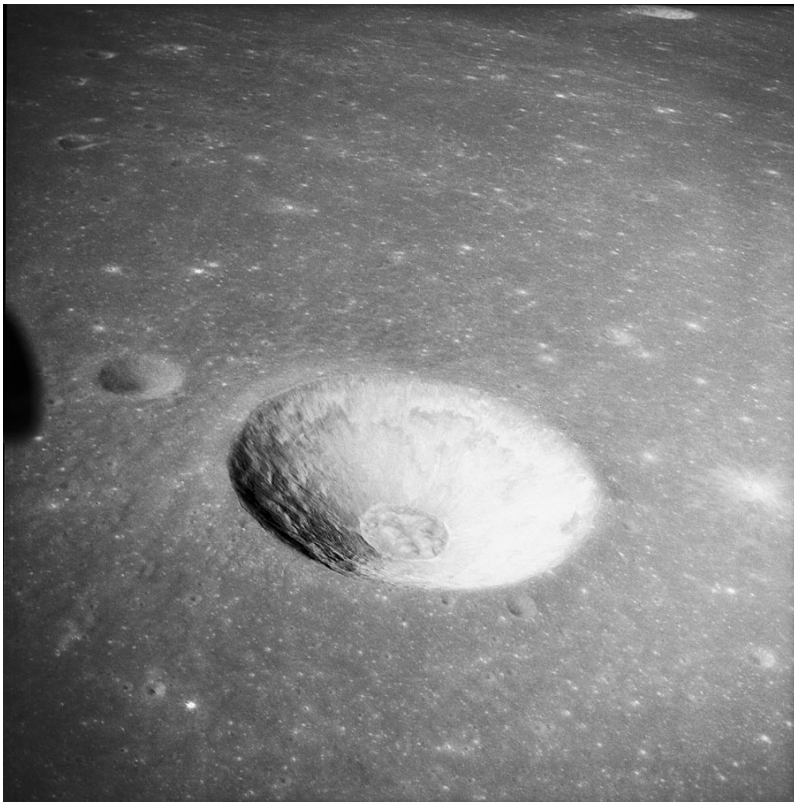


Figure 5 – Crater Messier B taken from Apollo 10



Figure 6 – Craters Moltke and Rima Hypatia (dubbed U.S. Highway Number One by the Apollo Astronauts).

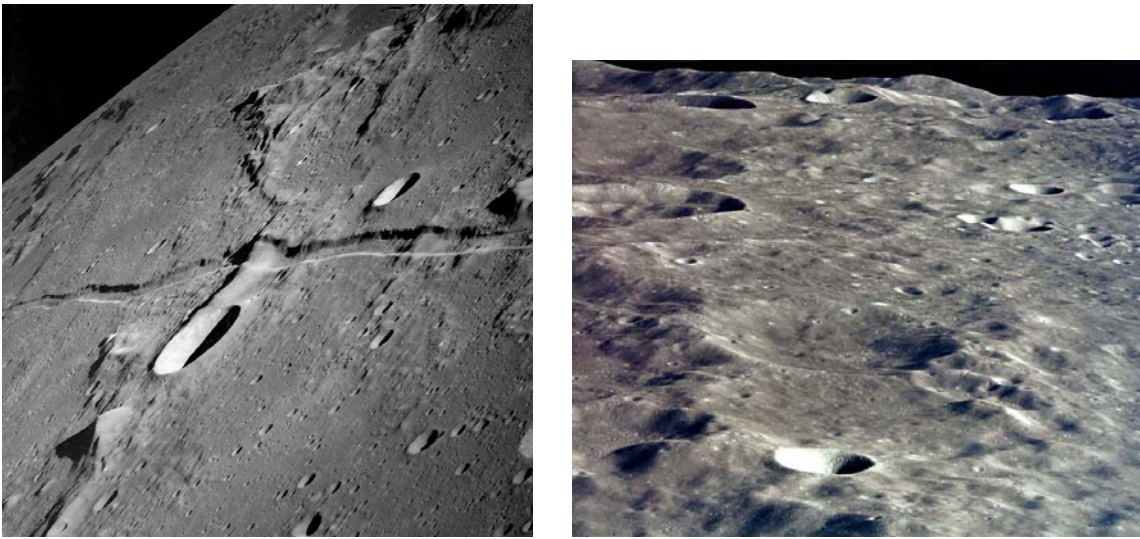


Figure 7 – Beautiful oblique shot of a crater and rille and a view of the lunar far side showing an area in the vicinity of IAU crater No. 300.

With Apollo 10's success, all the building blocks were in place for NASA to fulfill its goal of placing a man on the moon by the end of 1969. At the end of the mission, there were 169 days left in the year and the next mission, scheduled for "no earlier than July 16th", would be the main event.

I would witness my first rocket launch on July 16th from the LC-39 Press Site. Little did I know how this event would alter my own personal future. In less than a year, I would be a ground support engineer for Apollo 13.



Figure 8 – The crew of Apollo 10 aboard the recovery ship, U.S.S. Princeton and at a parade following their mission in Cocoa Beach, FL on A1A.

References

1. The Project Apollo Archive at http://www.apolloarchive.com/apollo_gallery.html for images.
2. *Apollo, The Race to the Moon*, Charles Murray and Catherine Bly Cox, Simon and Schuster, New York, NY (1989).
3. The Russian Space Web, by Anatoly Zak at <http://www.russianspaceweb.com> for N1 Moon Rocket images.

Postscript – ANNOUNCEMENT : SPECIAL BAY AREA EVENT!!!*Apollo 11 – 40th Anniversary Celebrations Aboard the USS Hornet Recovery Aircraft Carrier in Alameda.*

APOLLO 11 Anniversary Celebration

SPLASHDOWN 2009

July 23–26



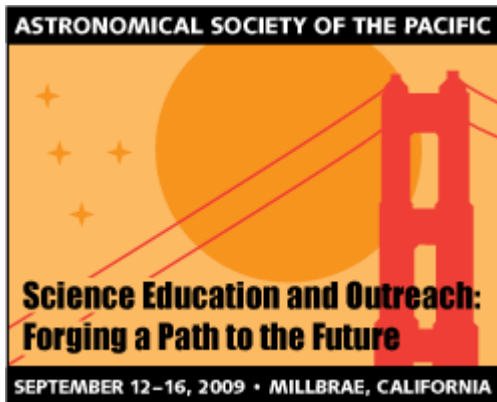
Photo included with permission

Join Astronaut Buzz Aldrin (the second man to step foot on the Moon) and others on the USS Hornet, where my recording of the launch of Apollo 11 made from the press site will be featured and many activities are planned commemorating the 40th anniversary of the mission and recovery of Apollo 11. The USS Hornet was the recovery ship for the Apollo 11 mission and has on board both Apollo boilerplate capsule and an open Mobile Quarantine Facility for inspection. Remember that, in 1969, we had no idea of the biologic hazards of the moon's environment and the astronauts went into isolation following their missions. Airstream was commissioned by NASA to manufacture several of the Mobile Quarantine Facilities for the Apollo missions and it is a rare treat to be able to actually walk into the Apollo 14 mobile quarantine facility.

The dates for this celebration are coincident with our club's Yosemite Star Party plans, but, if you plan to be in the bay area, this is the place to be on the weekend dates of July 24th, 25th, and 26th. "Splashdown 2009" is the official title of the Hornet's celebration and Aldrin will be signing his new autobiography "Magnificent Desolation". Copies along with "A" tickets for the book signing on July 25th will be available at the Hornet as premier launch of his newly published book. Check out the two links below for further information on the general celebration and Schedule of Events.

<http://www.uss-hornet.org/posters/splashdown/index.shtml>

<http://www.uss-hornet.org/posters/splashdown/schedule.shtml>



Science Education and Outreach: Forging a Path to the Future

September 12-16, 2009
Westin SFO, Millbrae, California

[Registration is now open](#) for the 2009 ASP meeting to be held in the San Francisco Bay Area at the Westin San Francisco Airport Hotel, 1 Old Bayshore Highway in Millbrae, California.

The ASP's annual meeting will be held in Northern California where the ASP was founded 120 years ago. The meeting will be located at the Westin SFO in Millbrae, California. In addition to the EPO symposia, there will be additional weekend hands-on workshops designed specifically for educators, as well as special sessions targeted to non-astronomy science practitioners.

How to Present	Registration	Proceedings	Meeting Schedule
Exhibitors	Lodging	Committee	Co-Sponsors

September 12-16, 2009
Westin SFO, Millbrae, California

Save the date for the Astronomical Society of the Pacific's 120th Anniversary celebration!

Registration is now open for the 2009 ASP meeting to be held in the San Francisco Bay Area at the Westin San Francisco Airport Hotel, 1 Old Bayshore Highway in Millbrae, California. The theme of the 2009 gathering will be "Science Education and Outreach: Forging a Path to the Future."

The meeting proper begins on Sunday evening, September 13, with the annual members' meeting and the opening reception. Meeting sessions begin on Monday, September 14, with the annual awards banquet held on Tuesday evening, September 15. The meeting will conclude the early evening of Wednesday, September 16.

In addition, the meeting will be preceded by hands-on workshops scheduled on Saturday and Sunday, September 12-13, for formal and informal educators, with a separate daily workshop registration fee from the meeting registration fee -- watch for specific information and an announcement of scholarships for workshop attendees shortly. (If you would like to propose a weekend workshop, contact the ASP separately at asilva@astrosociety.org.) Additional special events for the weekend are in the offing -- watch for announcements shortly.

Click on the links to find information and details on [hotel reservations](#), [meeting registration](#), [exhibiting](#), submitting [poster and presentation abstracts](#), and submitting [proceedings write-ups](#). Be sure to [sign up](#) to receive more information and meeting alerts, and check back frequently as information is added.

Please join us in September in the San Francisco Bay Area, during the International Year of Astronomy, the International Year of Science, and the 120th anniversary of the founding of the Astronomical Society of the Pacific, as we look forward and consider how, working together, we can advance a future of science literacy, enlightenment and achievement!

[Sign up to be notified](#) as additional meeting program events are announced.



Astronomical Society of the Pacific

GIVE A CHILD THE UNIVERSE: SHARE YOUR ENTHUSIASM FOR ASTRONOMY WITH A CLASSROOM NEAR YOU

Project ASTRO is looking for amateur and professional astronomers to work with teachers and students in 3rd-9th grade classrooms. This is a great opportunity to share your love of astronomy with an enthusiastic audience and help kids learn about science.

Project ASTRO pairs you with a Bay Area teacher at a school convenient for you. Together, you and your teacher partner first attend a 2-day summer workshop to learn hands-on, inquiry-based astronomy activities designed to involve students in the excitement of scientific discovery.

Project ASTRO partners receive "The Universe at Your Fingertips," a rich curriculum resource book, as well as access to books, videos, and telescopes from our lending library. Throughout the year, partners are invited to attend follow-up workshops.

Project ASTRO emphasizes ongoing partnerships that foster a nurturing environment for students to learn. To accomplish this, astronomers make at least four visits to their adopted classroom at mutually convenient times.

Project ASTRO has been operating since 1993 in the Bay Area. Previous participants often report that it is one of the most satisfying volunteer endeavors they have undertaken.

Graduate students and advanced undergraduate students majoring in astronomy are also encouraged to apply.

Astronomer applications are now being accepted for the 2009-2010 school year. The deadline is Friday, May 29th and space is limited. All participants are required to attend a 2-day workshop to be held August 7 & 8, 2009, at the San Mateo County Office of Education in Redwood City.

APPLY ONLINE by MAY 29th:

<http://www.astrosociety.org/education/astro/bayarea/volunteer.html>

CONTACT:

Allyson Clark, Project ASTRO Coordinator

Email: bayareaastro@astrosociety.org

MORE INFORMATION:

<http://www.astrosociety.org/baprojectastro.html>

Project ASTRO, a program of the nonprofit Astronomical Society of the Pacific, began with support from the National Science Foundation and the NASA Office of Space Science. Currently, over 500 active educator-astronomer partnerships bring the excitement of scientific discovery through astronomy to over 20,000 students annually.

Contacts mailing list

Contacts@aanc-astronomy.org

<http://mail.aanc-astronomy.org/mailman/listinfo/contacts>

MOUNT TAMALPAIS STATE PARK

MOUNT TAMALPAIS

INTERPRETIVE ASSOCIATION

INTERNATIONAL YEAR OF ASTRONOMY 2009 ASTRONOMY PROGRAMS

6/27 8:30pm Professor Lynn R. Cominsky, Sonoma State University

"Exploring the Extreme Universe with Fermi"

NASA's Fermi Gamma-ray Space Telescope (formerly known as GLAST) mission is exploring the most energetic and exotic objects in the cosmos: blazing galaxies, intense stellar explosion and super-massive black holes. Fermi Probes the Universe on scales from the infinite to the infinitesimal, and future observations may shed light on the nature of dark matter.

7/25 8:30pm Dr. Natalie Batalha, San Jose State University

"Kepler's Hunt for Habitable Planets"

NASA's Kepler Mission has begun its 3.5-year quest for habitable planets like Earth in our galaxy. Dr. Batalha will describe how and where the spacecraft will look for planets we might call home and what to expect in the coming years as we work to understand whether Earth-like planets in our galaxy are common or rare..

8/22 8:30 Dr. Anthony Colaprete, NASA-Ames Research Center

"Prospecting for Water on the Moon"

In 2009, NASA will purposely crash two spacecraft into one of the Moon's polar regions. The impacts should raise huge plumes of material, visible even to smaller telescopes on Earth. Astronomers will search for evidence of water in the plumes to get a better sense of how much frozen water may lay hidden in the deep, shadowed craters of the Moon's North and South poles.

9/19 8:30 Wil van Breugel, Ph.D, University of California Merced

"Astrobiology: What is Life & Where is It?"

Astrobiology combines astronomy, biology, physics and chemistry to investigate the origin and evolution of life in extreme environments, including early Earth, and guides the search for alien life on other planets in our Solar System and beyond. Dr. vanBreugel will discuss how our perception and understanding of life has evolved, and the close connection of life to the cosmos.

10/24 7:30 Professor Michael Dine, University of California Santa Cruz

"The Dawn of the LHC Era: The Convergence of Particle Physics and Astrophysics"

Over the past year, the Large Hadron Collider, an extraordinary scientific instrument, has begun to operate in Geneva. It offers the possibility of answering some of the great questions we confront in understanding the universe, including the identity of the dark matter and the asymmetry between matter and antimatter

San Francisco Amateur Astronomers
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