ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 57, No. 3 – March 2009

Wednesday, March 18, 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)

LYNN J. ROTHSCHILD

Evolutionary Biologist-Astrobiologist, NASA's Ames Research Center
Professor, Stanford University and Brown University

WHY AN ASTRONOMER SHOULD CARE ABOUT ASTROBIOLOGY?

This talk is aimed at reaching across the academic divide to encourage the dialog between biology and astronomy in service to astrobiology.

Astrobiology focuses on three of our deepest questions: Where did we come from? Where are we going? Are we alone? It has sparked the imagination of students, academics and the public at large. Astrobiology liberates biologists to think of life in other times and places, beyond the single data point present on planet earth. Similarly, it has recast astronomy to think in terms of habitability, from the raw ingredients for life to questions of temperature, obliquity, relationship between parent stars and their planets, the effects of supernovae, and many more.

Dr. Lynn J. Rothschild, is an evolutionary biologist-astrobiologist at NASA's Ames Research Center, and Professor at Stanford and Brown University, where she teaches Astrobiology and Space Exploration, inter alia. She has broad training in biology, with degrees from Yale, Indiana, and a Ph.D. from Brown University. Since arriving at Ames in 1987, her research has focused on how life, particularly microbes, has evolved in the context of the physical environment, both here and potentially elsewhere. She has co-edited a book on the subject entitled, "Evolution on Planet Earth: The Impact of the Physical Environment" (Academic Press, 2003). Rothschild has studied carbon metabolism and DNA damage and repair in the laboratory setting and on algae, work that has taken her to field sites in such locations as the thermal areas in Yellowstone National Park, New Zealand, Australia, Kenya's Rift Valley, hypersaline environments in the San Francisco Bay, Baja California and the Bolivian Andes. Her current lab members are actively pursuing topics ranging from radiation resistant invertebrates to resistance mechanisms in halophiles and algae to synthetic biology. Most recently she has taken to the air in conjunction with the Aeronautics and Astronautics Department at Stanford, flying experiments up to 106,000 feet on high altitude balloons. Courtesy of the Galathea 3, she has also had experiments on a Danish oceanographic cruise from South America to Copenhagen, leading to the only documented rescue by the US Coast Guard of a lost driver in Boston.

Rothschild lectures frequently worldwide, including at the Vatican and Windsor Castle, Mystic Seaport and the Royal Society of London. She appears frequently on radio and television programs, including the BBC, NPR, National Geographic, Discovery Channel, ABC World News Tonight, and the History Channel. Like Darwin, Rothschild is a Fellow of the Linnean Society of London, and also a Fellow of the California Academy of Sciences and the Explorers Club.

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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.or**

PRESIDENT'S COLUMN

At 10:49 p.m. EST on March 6, a Delta II rocket carrying the Kepler spacecraft had lift-off from Launch Complex 17-B at Cape Canaveral.

Friday's launch (Credit: NASA/Jack Pfaller)

The Kepler mission will be an important stepping stone to answer the question: "Are we alone out there?" We already know that our sun is not unique in harboring a planetary system. And we know this not only based on theoretical models of solar system formation or the observation of protoplanetary disks – precursors of planetary systems – around young stars in our galaxy. Over the past ten years, we found direct evidence of 342 exoplanets from terrestrial observations using e.g., the Keck Interferometer and from space with the Spitzer and Hubble Space Telescopes.

All currently available methods for the detection of exoplanets are based on the observation of disturbances that these planets cause to their stars. Two commonly utilized phenomena are:

1. The gravitational pull of a planet causing a slight wobble effect on its star that can be measured as a periodical Doppler shift
2. The blockade of a tiny portion of the star's light as a planet transits between the star and Earth leading to a periodical dip in the star's apparent brightness (transit method)

These effects are obviously most pronounced and therefore easiest to observe if caused by large massive planets in close orbits. Therefore, the current exoplanet count looks a bit one-sided:
Jupiter-like planets*: 342 – earth-like planets: 0!
(*: by and large including some exotic variants)

Kepler is the first space mission carrying an instrument (basically a 0.95m Schmidt telescope with a photometer consisting of an array of 42 CCDs) to detect earth-size planets in the habitable zone around their stars. It will make brightness measurements of 100,000 stars in the constellation Cygnus every 30 minutes using the transit method.

Kepler's targeted star field. (Credit: Carter Roberts of the Eastbay Astronomical Society)

Kepler's commissioning process will take about 60 days and includes ejecting the dust cover and calibrating the instrument. But when the first blue planet in a comfortable orbit shows up, then it is time to take a vacation, pack your suitcase, and head out to K-Pax (don't forget your passport; it would be too bad to undertake the trip only to be sent home by an immigration officer with twelve tentacles).

Here are some great web resources:
http://www.nasa.gov/mission_pages/kepler
http://planetquest.jpl.nasa.gov/index.cfm

DIRK LAMMERTS
PRESIDENT

IMPORTANT DATES

SFAA GENERAL MEETINGS & LECTURES

Wednesdays
March 18
April 14
May 20
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)

BOARD MEETINGS

Tuesdays
March 10
April 15
May 12
7:00-8:30 p.m.
Randall Museum, 199 Museum Way
(Near 14th Street and Roosevelt)

CITY STAR PARTIES - TELESCOPE CLINIC ONE HOUR BEFORE SUNSET

Lands End (Point Lobos)
March 7 – 7:00 p.m.
April 4 – 7:30 p.m.
May 9 – 8:00 p.m.
Weather may cancel the City Star Party

Please note that while City Star Parties WILL ALWAYS be held on Saturdays, some will be closer to the last quarter phase of the moon, while 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 members-only events on Mt. Tam.

Map and directions – Land's End (Pt. Lobos) http://www.sfaa-astronomy.org/clubarchive/directions-pointlobos.php

MT TAM STAR PARTIES – SPECIAL USE PERMIT – MEMBERS ONLY

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).

SATURDAYS - GATEKEEPERS NEEDED
March 28 – 6:25 p.m. . MESSIER MARATION !!!
April 25 – 7:55 p.m.
May 23 – 8:20 p.m.

UPCOMING GUEST SPEAKERS

April 15 - Andisheh Mahdavi

COSMIC ORIGINS: HOW UNSEEN FORCES LED TO THE RISE OF STARS, PLANETS, AND CARBON-BASED LIFE

Andisheh Mahdavi is an observational and computational astrophysicist focusing on clusters of galaxies, the largest gravitationally bound cosmic objects. Mahdavi specializes in marshalling data from orbiting X-ray satellites and ground-based optical and radio telescopes to understand the physics of dark and ordinary matter in clusters.

May 20 - John Dillon – Curator, Randall Museum
Past President, San Francisco Amateur Astronomers

THE AUTOPSY OF HEAVEN: GALILEO, TELESCOPES AND THE BEGINNING OF MODERN SCIENCE

The world is about to celebrate the 400th anniversary of Galileo's telescope and the revolutionary observations he made with it. When he published his discoveries, the story goes, Galileo threw off the yoke of the ancient Greeks and challenged the authority of the Church – thus opening the way for "modern" science. John Dillon will take a longer view of the history of science and explore a subtler, more complex, relationship between Galileo, telescopes, Science and the Church.

OPEN SECRETARY POSITION

SFAA is seeking a new secretary. As a voting member of the board, the secretary has an active role in setting the future direction of SFAA. Primary duties include: attending monthly board meetings and recording meeting minutes, administering the SFAA Star Rewards volunteer program, preparing and mailing SFAA correspondence, sending regular event e-mail announcements to the general membership, and counting and recording votes for SFAA yearly general elections.

Total time commitment per month is approximately 3-4 hours, and regular attendance of monthly board meetings.

No prior experience in secretarial duties required, only the desire to help SFAA continue its mission of bringing great astronomy programs to its members and to the public.

If you are interested or have questions about the position, please send an e-mail to Barbara Arrighi, secretary1@sfaa-astronomy.org

MESSAGE RE SFAA YOSEMITE STAR PARTY AT GLACIER POINT

Our Yosemite weekend is July 24-25. Not bad huh? You can thank Dave Frey and Peter Schumacher for lobbying top dates.

Make sure you sign up soon to be in the top 30 of happy campers. Email Dave Frey <David.Frey@som.com> with "Yosemite SP Sign-Up Request" in the subject line. In the body of the email please state your name and co-camper(s), your type/size of telescope and whether you will be staying at Bridalveil Campground or not.

Here are the dates all clubs were awarded this year: http://www.planitarium.net/sfaa/calendar/yosemite09.doc

Ken

40 Years Back Toward the Moon – Apollo 9

Jim Cottle

On March 3rd, 1969, Apollo 9 was launched from the Kennedy Space Center aboard the second manned Saturn 5 for an "all up" test of the lunar landing hardware, namely Lunar Module 3, developed at Grumman Aerospace in Long Island, NY. Although its 10-day mission was a big wide yawn by everyone outside of those involved in the program, it nevertheless had a technically challenging agenda and the only way to test the capabilities of a spacecraft as fragile and gangly as the lunar module. This first ever flight test was an outstanding success.

I was 16, a senior at Dixie Hollins High School in St. Petersburg, Florida, busy with my weekly classical radio show on WQXM (I still have tapes, in case you're interested). Also, there were band practices, Thespian Troupe 2055 meetings and weekly private piano lessons. For me, it still wasn't clear what path I would take, music, engineering, electronics, radio, drama? it would all be revealed in time. I had not quite caught the bug of Apollo and was too busy to pay attention to the unparalleled social strife of the late '60s.

The Apollo program would eventually ***almost*** rescue me from academic disaster at the University of South Florida, that is, if it hadn't been for the hormones of a delayed adolescence in combination with the liberating lifestyle of Cocoa Beach. It is unfathomable to me today that NASA-KSC hired me with little more than a 2.0 grade point average and granted me a secret security clearance and LC-39 pad clearance at 17 years of age[1]. This was truly the Sputnik threat benefit, and I did not have the GPA for the Coop listing "CIA" which *really* sounded cool. My best friend, Bill, took that route, and I found out that, for engineering majors, CIA was just a placeholder for "NO SUCH AGENCY." To this day, I wonder *what I missed* and am morbidly fascinated. When I finally dropped out of USF in 1973 with barely a 1.9 grade point average, Bill told me that, due to my professed orientation, he could no longer associate with me because of ubiquitous and unpredictable lie detector tests for his clearance and "oh, by the way, would you mind if I dated Darlene?" (my freshly ex'ed-fiancé). It was a sign of things on the near horizon in a long, sometimes painful stumble to gain my new footing. I would stay away from the University for nearly 7 years.

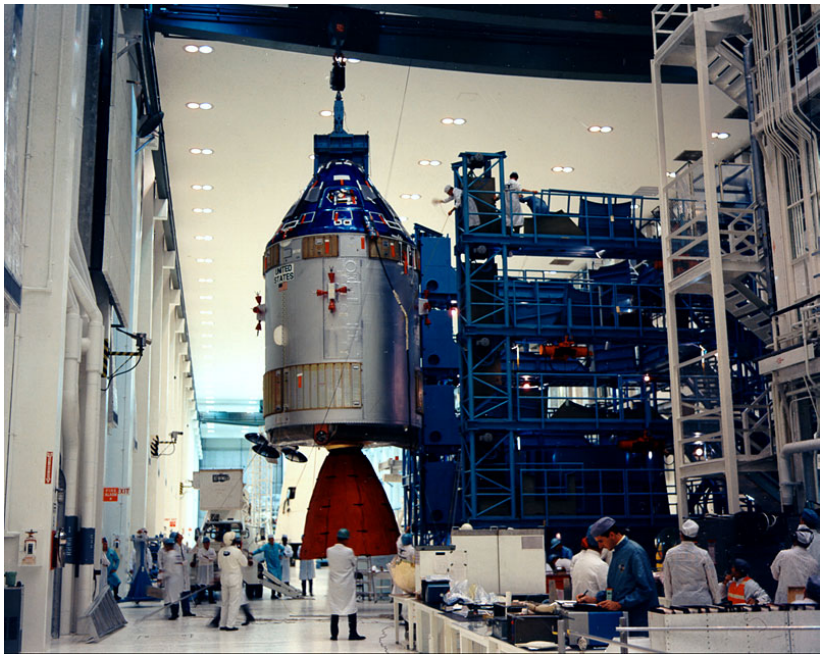
But, I digress….let's get back to Apollo 9..

[1] My Mom reminds me today that a Wackenhut employee lambasted me upon my arrival at KSC, while getting my NASA badge, with "Aren't you a little young to be working here?" I think I shoved that to the deep recesses of forgetfulness.

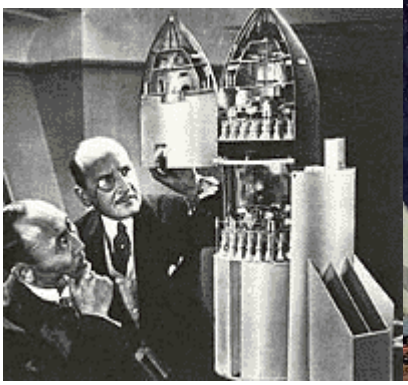
Figure 2 – "Someone is upside down" – LM-3 "SPIDER" in low earth orbit.

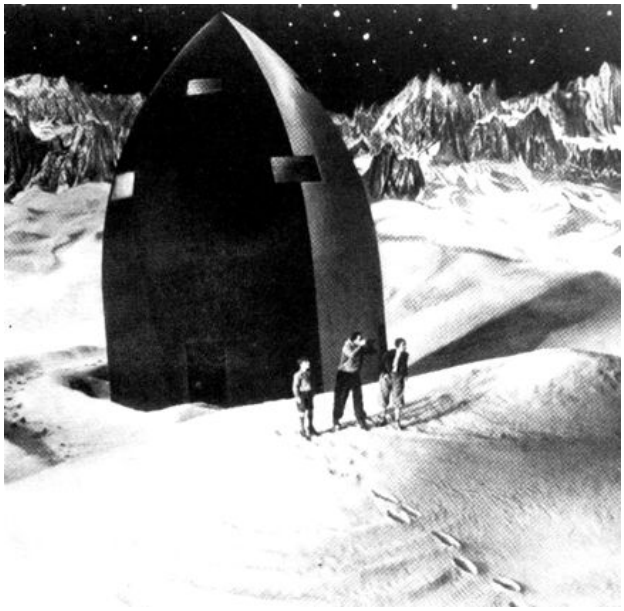
The Bug-like lunar module, manufactured by Grumman Aerospace was affectionately dubbed "Spider" by the Apollo 9 crew, with the command module CSM-104 receiving the call sign "Gumdrop" for their fitting visual descriptions. The 10-day mission was confined to a low-earth orbit for a complete shakedown of capture, release, docking rendezvous and lunar module flight. In addition, the astronauts of Apollo 9 were asked to provide a last minute check of the space worthiness of the Apollo space suit.

Figure 3 – Command/Service Module CSM-104 "GUMDROP" in the Manned Spacecraft Operations Building of KSC.



After the amazing Christmas time flight of Apollo 8, the mission of Apollo 9 was truly one for only those who were aficionados following the program, the NASA team, contractors, and astronauts. The mission was largely ignored by the US public and got little attention in the media. Its unqualified success however allowed NASA managers to pencil in July as the G-mission (in Owen Maynard's alphabetic series), which would be the lunar landing and the fulfillment of JFK's challenge less than 8 years after his famous speech at Rice Stadium.





A strange looking beast

The lunar module was indeed an unlikely craft, in the mind of any experienced aviator. Its realities more represented the fantasies of Frau Im Mond, or Destination Moon. Its systems were extremely difficult to develop and some were completely not testable on the earth's surface. Indeed, the lunar module's weight restriction requirements were such that materials had to be so light, and so thin that, on the surface of the earth, it could not support its own weight.

These difficulties are very dramatically described by Charles Murray and Catherine Bly Cox, (*Apollo – The Race to the Moon*, Simon and Schuster :1989):

> "It had been hard for the Grumman Engineers to get used to the idea that, because the Lunar Module would function exclusively in the vacuum of space, it could be any shape it wanted to be," as one of the early designers put it. "The realization of this was slow to come…it didn't have to be round edged and smooth, that it could be square. Thing could stick out at odd angles, it didn't make any difference. It was disorienting."
>
> "It wasn't just the shape that was different; the materials were also different. The result was that the LM's materials were so light that the felt like paper to the workers at the Grumman plant. Because they were so light and flimsy, fittings often couldn't be stamped out without creating stress lines, so much of the LM was made by hand, with Grumman technicians taking a block of metal and milling it until it fit the blueprint."

"To complicate matters, the propellants for LM were so incredibly volatile, on technician remembered, that he could dip a stick into the oxidizer and flick a few drops onto snow on the ground-and the snow would catch fire. The internal pressure in some of the tanks was in the neighborhood of 6000 pounds per square inch. This combination of lightweight materials, caustic gases, and high pressures was particularly dangerous. One day, a technician at White Sands working with a fully fueled test article was filling out a report and absentmindedly clicked the end of his ballpoint pen on a fuel tank. The pen exerted just enough extra pressure on the tank to open a pinprick leak. Eventually, as the story goes, they found the pen embedded in a fence post, along with a fragment of finger bone. The wire-thin stream of propellant had sliced the finger off as neatly as a scalpel.

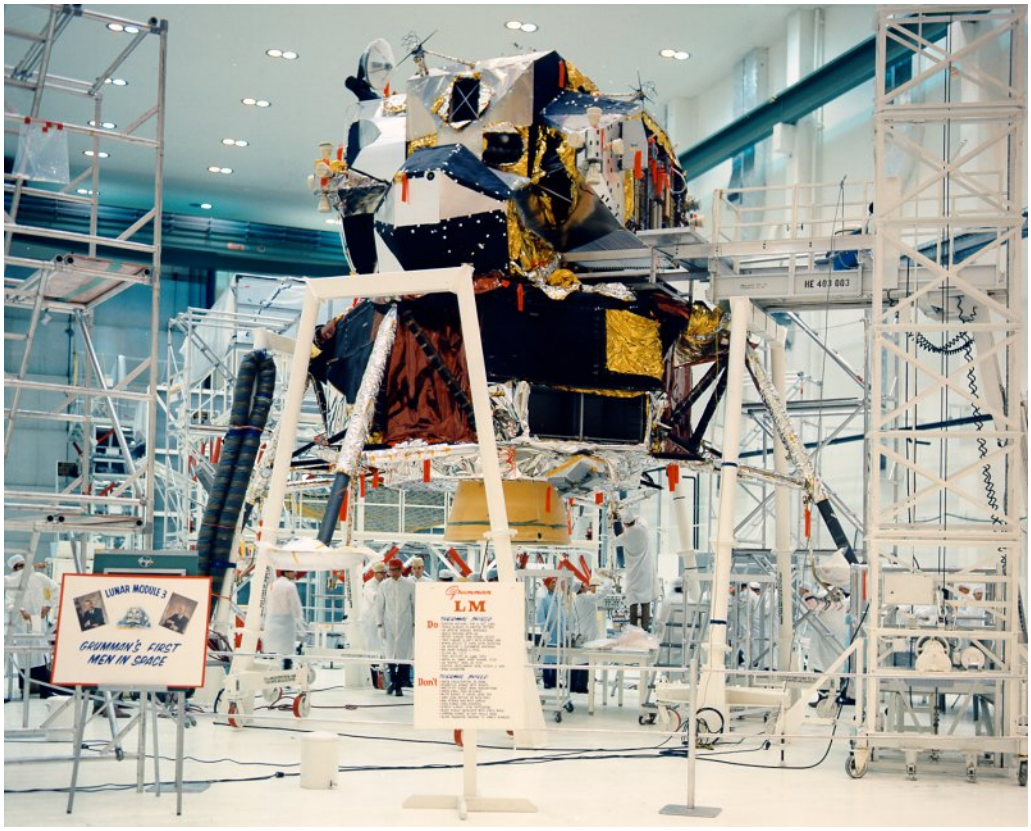


Figure 3 – LM-3 at Kennedy Space Center's MSOB prior to transfer to the Vertical Assembly building. Note the support struts preventing the crushing effects of Earth's gravity and the segmentation between the Ascent and Descent stages. The large decent engine bell is shown toward the bottom center in yellow.

Although the Apollo Command Module (CM) had borrowed strongly from the capsules of Mercury and Gemini, and was a spacious improvement, the flight of LM-3 aboard the Apollo 9 was the first time ever for a real, bona fide "*spacecraft", designed only for flight from weightlessness to Lunar gravity and back.*

So now, in case you have any doubts about "wasteful resources being spent on the Apollo program", let me assure you that Grumman applied its expertise in perhaps a more familiar form to most of us. This design epitomizes the "corporate-creativity" that was inspired by Apollo and has saved many dollars in energy and replacement costs.

Figure 4 – Close Encounters of the Third Kind - The Grumman USPS super light postal vehicle (LLV). The similarity to the Lunar Module might not be immediately obvious (however, note the triangular angled window!).

In 1969, no pilot had ever flown such a craft with the exception of simulation (the Lunar Module, that is). The closest approximation to its real, earthbound simulation nearly killed Apollo 11 commander Neil Armstrong who bailed out just in time to avoid catastrophe. I suspect that many more individuals are more familiar with the details of piloting the Grumman LLV rather than with the Grumman LM. In fact I have recently observed regular, routine and successful docking and rendezvous maneuvers in front of my house on Market Street. I must confess that the apathy of the day has cloaked my fascination that these are ***actually sightings of an alien craft!***

The wonderful success of Apollo 9 paved the way, in its 10-day mission, for the "so close but so far away – tease" of Apollo 10 and the inevitable successful fulfillment of John F. Kennedy's bold challenge to the nation in 1962, just after the second Mercury Atlas launch of Scott Carpenter in MA-7. The Grumman engineers toward the end of 1968 no doubt felt, first-hand, the prophetic nature of his rhetoric as they struggled with the Lunar Module:

> *"We choose to go to the moon … and do the other things, not because they are easy but because they are hard…"*
>
> *John F. Kennedy – September 1962*

NEXT TIME – Apollo 10 the FULL DRESS REHEARSAL

SFAA Messier Marathon . March 28, 2009

Michael Portuesi

The Messier Marathon is based on a list of 110 deep-sky objects discovered or compiled by Charles Messier in the 1700's. While Messier worked hard to discover comets, he compiled his list so that he could avoid mistaking the objects for new comets. Today, the Messier Objects form an introduction to deep-sky observing for countless amateur astronomers.

Due to a fluke in the distribution of the Messier Objects across the sky, it is possible to view all objects on the list in a single night during early spring (usually March or April). Amateur astronomers challenge their abilities, or build their observing skills, by trying to locate all the objects on the list.

The SFAA Messier Marathon will be held the night of Saturday, March 28 at Mount Tamalpais State Park, Rock Springs parking lot. This is the site of our normal Mount Tam Star Parties. **As this is a Special Use Permit (SUP) event, it is open to SFAA Members Only. The general public is not allowed.**

Registration is not necessary. Please dress warmly with several layers—it is cold this time of year, and the Messier Marathon is an all-night experience!

Weather Info

You can call the SFAA hotline (415) 289-6636 (that's 289-NOFOG) the afternoon of the event for cancellation info due to bad weather, or check the SFAA website.

Finder Chart

- Utah Skies Messier Telrad Finder Charts
  - http://www.utahskies.org/deepsky/messier/charts/messierTelradFrameSet.html

Photos

It's very useful to have some photos of the Messier Objects to help you verify your findings.

- SEDS Messier Database
  - http://seds.lpl.arizona.edu/messier/Messier.html

Star Party Etiquette

IF THIS IS YOUR FIRST STAR PARTY: Please check the following web page for star party etiquette: http://obs.nineplanets.org/psc/etiquette.html

Above all, bring a red flashlight, or tape red tape over the lens of a white flashlight. (You can get red tape at an auto store—it's the stuff used to cover broken taillights). Also arrive before dark so you can set up your equipment in daylight, and allow our gatekeepers to lock the gate and get back up the mountain. The Marathon starts as soon as it gets dark, so you won't want to miss it!

Other Resources

- SEDS Messier Marathon Page
  - http://seds.lpl.arizona.edu/messier/xtra/marathon/marathon.html
- MessierMarathon.com
  - http://www.messiermarathon.com/
- AANC Messier Marathon Page
  - http://www.aanc-astronomy.org/calendar/messiermarathon/index.html

2009 . INTERNATIONAL YEAR OF ASTRONOMY

DSA: GLOBE at Night 2009: March 16-28, 2009

http://www.astronomy2009.org/news/updates/185/

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Once again, people around the world are invited to participate in a citizen-science program to monitor local light pollution. The campaign known as GLOBE at Night is part of the International Year of Astronomy (IYA2009) through the Dark Skies Awareness Cornerstone Project. IYA2009 is a global celebration of astronomy and its contributions to society and culture, marking the 400th anniversary of the first use of an astronomical telescope by Galileo Galilei. IYA2009 is endorsed by the United Nations and the International Council on Science (ICSU) and initiated by the International Astronomical Union (IAU) and UNESCO to help the citizens of the world develop a greater appreciation of astronomy and rediscover their place in the Universe. IYA2009 events and activities will take place at global, regional, national and local levels through collaborations between professional and amateur astronomers, science centers, educators, and science communicators occurring throughout the year.

GLOBE at Night provides an opportunity for participants to go outside and observe the constellation Orion from 16-28 March 2009. Participants simply choose a clear night on which stars are visible, take measurements of stars in this portion of the sky using GLOBE Magnitude Charts, and enter observations into the GLOBE at Night Web site. Students--alongside teachers, parents and community members-- amass a data set from which they can begin to explore the concept of light pollution and to research patterns occurring across the globe.

Light pollution is now recognized as yet another human-made form of pollution similar to air, water and noise pollution that causes damage to our environment. Light pollution is defined by the International Dark-Sky Association as any adverse effect of artificial light, including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste. Unobtrusive artificial lighting directed downward that sensibly illuminates roads and property is considered necessary and useful lighting, but excessive lighting or lighting that leaks sideway or upwards is wasted lighting and constitutes light pollution.

Light pollution takes a toll on our environment. It is wasteful, requiring energy often generated from non-renewable sources such as oil and coal. It affects wildlife, such as sea turtles, who bury their eggs in sandy beaches at night and then return to the sea guided by the sight of shimmering seas reflecting moonlight, which nature intended to be the brightest light on any given night. Artificial light confuses them, luring them away from the ocean and subjecting them to the dangers of roads and predators. Light pollution has been shown to affect the mating, migration and predation behaviors of many different species. Light pollution obscures the night sky for astronomical observations, disrupts ecosystems and can have adverse health effects. Light pollution has a less measurable, but equally important, consequence: the great loss to the human experience when we cannot gaze up into a night sky full of stars.

GLOBE at Night helps students become aware of Earth as a system while observing the atmosphere and learning that what we do on earth affects the skies above. Participation in GLOBE at Night is open to anyone who lives or works in one of the 110 GLOBE countries and can get outside and look skyward during 16-28 March. You can enter your observations on the GLOBE at Night Report web page from 16 March - 7 April. If you are not located in a GLOBE Country, please contact the GLOBE Regional Desk Officer for your region to learn more about how a country can join. Participation does not require any special training or instruction. The GLOBE at Night Web site will provide all the information needed to participate, including instruction guides for teachers, students, and parents. There is no cost to participate in GLOBE at Night.

Please share information about GLOBE at Night with anyone who might be interested. Color postcards and one-page flyers are available on the Web site for you to distribute. In 2008, citizen scientists from around the world submitted nearly 7000 observations. Help us top that in 2009!

GLOBE and the National Optical Astronomy Observatory (NOAO) would like to acknowledge: NASA, NSF, and the U.S. Department of State for their financial and in-kind support of GLOBE at Night activities as well as UCAR Education and Outreach and Windows to the Universe for their help in developing the GLOBE at Night Web site and learning activities, ESRI for their support of GLOBE at Night data collection and visualization, and CADIAS, IDA and UNESCO for their help in promoting GLOBE at Night around the world.

Also, on the last night of GLOBE at Night, March 28, 2009, Earth Hour will take place between 8:30 and 9:30pm. Earth Hour is a wave of darkness that encompasses the Earth at that time. Nearly 1000 cities from over 80 countries will participate by turning out lights. On 2-5 April 2009, continue participating in IYA2009 through the four-day event 11 Hours of Astronomy! One of the key goals of 100 Hours of Astronomy is to have as many people as possible look through a telescope as Galileo did for the first time 400 years ago. You can purchase your own Galileoscope™ as well! The Galileoscope™ is a high-quality, low-cost telescope kit developed for the International Year of Astronomy 2009 by a team of leading astronomers, optical engineers, and science educators. No matter where you live, with this easy-to-assemble, 50-mm (2-inch) diameter, 25- to 50-power achromatic refractor, you can see the celestial wonders that Galileo Galilei first glimpsed 400 years ago and that still delight stargazers today. These include lunar craters and mountains, four moons circling Jupiter, the phases of Venus, Saturn's rings, and countless stars invisible to the unaided eye. Check the IYA2009 Web site for on-going star gazing activities!

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Sharing the Wonders of the Universe

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