

★ ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 56, No. 3 – March 2008

March 19, 2008 – General Meeting
Randall Museum . 199 Museum Way . San Francisco
7:00 pm Doors Open . 7:30 pm Announcements . 8:00 pm Speaker

Don Machholz **“A Celebration of the Messier Marathon ”**



Join well-known comet hunter, Don Machholz for a special presentation on the 18th century astronomer, Charles Messier, who is famous for compiling the Messier Catalog of 110 celestial objects. The Messier Marathon , which Machholz helped to design and promote will be discussed in this exciting presentation.

I was born in Portsmouth Virginia, Oct, 7, 1952 and became interested in astronomy at age 8. I received my first telescope on Oct. 7, 1965, a 2-inch refractor. Later I received a 6-inch Criterion Dynascope and found all the Messier Objects in one year (1968-9).

Then I spent some time with astrophotography (1972-4), having a few photos published in small astronomy magazines. I decided to attempt a comet hunting program, which I began on Jan. 1, 1975. I found my first comet on Sept. 12, 1978 after 1700 hours of searching. My second find took an additional 1742 hours. I have now spent 7055 hours comet hunting during which I've discovered a total of ten comets which bear my name.

In 1990 my wife, son and I moved from San Jose, CA. to Colfax, where we live on six acres. The main reason for this move was to transfer from two incomes to one so that my wife could stay home with our children. In August 1993 I built an observatory on our property. From here I conduct all my comet hunting, which continues at a rate of about 100 hours (70 nites) per year. I use mainly inexpensive, homemade equipment.

One of my joys has been in sharing the hobby with others. A dozen times a year I'll set up a few telescopes in Colfax, Auburn and in the Sierras and invite the public out to look at the planets and moon. Each year I hold astronomy classes at the Placer Nature Center. I also write articles for the local newspapers and radio stations for special astronomical events.

From 1978 until 2000 I wrote writing a monthly column called "Comet Comments". It was designed for astronomy club newsletters and interested individuals around the world. Between 1988 and 2000 I was the Comets Recorder for the Association of Lunar and Planetary Recorders.

I have two two-year college degrees. One is in general education (1976) and the other in Laser Technology (1989). I am employed both as an Research and Development technician in Auburn and as an independent real estate appraiser.

I've written and published several books. One, "A Decade of Comets", is a study of the visual comet discoveries between 1975 and 1984. The second covers the Messier Marathon and is based on my 16 years of helping to develop and run Messier Marathons. The third, published in early 1996, is a book about Comet Hale-Bopp. In 2002 my Messier Marathon book was re-written by me and published by Cambridge University Press.

2008 CLUB OFFICERS & CONTACTS

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	Elan Morpurgo	(415) 242-1464
	Jorge Morales	
<i>Alternate Board Members</i>	Jared Willson	
	Lon Carter	
<i>Webmaster</i>	Joe Amato	Web-master@sfaa-astronomy.net

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 pg@lbin.com 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 president@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/agabrielli@sfaa@sbctglobal.net
- 7) 8" f/10 Meade SCT/Stefanie Ulrey/treasurer@sfaa-astronomy.org
- 8) 9.5" f/5.6 Celestron Newtonian/Ken Frank/kennethfrank@planitarium.net

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.

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.

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

IMPORTANT DATES

SFAA GENERAL MEETINGS & LECTURES

Wednesdays
March 19
April 16
May 21

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 11
April 8
May 13

7:00-8:30 p.m.
Randall Museum, 199 Museum Way
(Near 14th Street and Roosevelt)

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 am except on specially approved nights (such as Messier Marathon).

SATURDAYS

March 8 (Messier Marathon) - 6:11 pm **Gatekeepers: Barbara (One additional volunteer needed)**
April 5 – 7:37 pm **Gatekeepers: Stephanie (One additional volunteer needed)**
May 3 – 8:02 p.m. **Gatekeepers: Robert (One additional volunteer needed)**

CITY STAR PARTIES - TELESCOPE CLINIC ONE HOUR BEFORE SUNSET

Saturday, March 22, 7:17 p.m. at Randall Museum – Speaker - **VIVIAN WHITE** - Subject to be announced
Saturday, April 12, 7:43 p.m. at Land's End (Point Lobos)
Saturday, May 24, 8:21 p.m. at Land's End (Point Lobos)

Weather may cancel the City Star Party. Call the SFAA Hotline at (415) 289-6636 **AFTER 4 PM** to learn the status of the event and the location. If the hotline announces the Star Party is cancelled, the Telescope Clinic and Lecture are cancelled as well. However, if the Hotline does not cancel the Star Party, be assured that the Lecture will proceed as scheduled even given less-than-perfect telescope conditions.

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 PUBLIC STAR PARTIES

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, approx. 11 pm-2 am. For more information go here: <http://www.sfaa-astronomy.org/starparties/>

VOLUNTEER GATEKEEPERS ARE ALWAYS NEEDED

May 10 – 8:09 p.m.



NEW SFAA MEMBERS

Scope City is offering to new members a \$25 credit toward the purchase of telescopes and binoculars.

Obtain a receipt for dues payment from

Vivian White, Treasurer,

treasurer@sfaa-astronomy.org.

Contact Sam Sweiss at Scope City to arrange for your discount.

PRESIDENT'S COLUMN

We had a great City Star Party at Land's End and the amazing Total Lunar Eclipse event at the Randall Museum last month. We enjoyed great weather, 6+ telescopes including a solar scope, and more than 30 people attending at Land's End. Keep in mind that City Star Parties in March, June, September, and December will be held at the Randall, while the others will be at Land's End provided that the weather plays along.

On February 20th, the weather gods were again in good spirits when we had the Total Lunar Eclipse event at the Randall. It didn't look promising earlier that week with constant rain and cloud cover. But on the day of the eclipse, the rain stopped, the cloud cover broke, and we enjoyed fairly good views. The observing was followed by "Moonology" talks from John Dillon & Michael Portuesi. Mark your calendar if you missed this TLE. Unfortunately, the next TLE visible from our location won't happen before Dec. 21st, 2010.



So what's planned for March? On March 8th, we have the members only SUP Star Party on Mount Tam. This month's SUP event is in the spirit of the Messier Marathon, which is the attempt to locate all 110 Messier objects in one night. There are several websites that help get prepared for this. <http://www.davidpaulgreen.com/tumol.html> has a downloadable observing log in pdf format that includes object descriptions, star charts, and more (see example below). One obvious challenge for the marathon is determining the best sequence for observing all objects in one night (hint: it is not M1, M2, M3 ... M110). This observing log also lists a search sequence starting with M77 in Cetus and ending with M30 in Capricornus. Another website with a lot of useful information is <http://www.seds.org/messier/>. Give the marathon a try if you are in the "collect them all" mood or just come for casual observing.



Our guest speaker at the March 19th general meeting will be Don Machholz of comet hunting fame. Don will talk about Charles Messier and the Messier Marathon, a topic on which he has also published several books.

Also on March 8th will be the gatekeeper training at Pantoll Ranger Station. This is very important, as we can only conduct our Mt. Tam Star Parties with gatekeepers on duty. We have a record of eleven members signed up for this training, which is absolutely outstanding - a big thanks to Barbara Arrighi for organizing and promoting the training.

This Newsletter features the first in a series of articles by Jim Cottle on the journey to the Moon 40 years ago. "Looking 40 Years Back Toward the Moon" is the introduction for an ambitious project to chronicle and comment on the 18 months that culminated with the Apollo 11 Moon landing on July 20th, 1969. We will try to stay in synch with the events 40 years ago as much as possible. Here is the list of topics for future articles throughout the rest of 2008:



- "The Far Side of the Moon - The Robotic Moon Missions" (May/June)
- "Powerful, Ugly and Untamed Forces - The Giant POGO stick" (Summer)
- "Apollo 7 - Cluster's Last Stand and Shakedown of the Block II CM" (October)
- "Apollo 8 - The Christmas That Couldn't be Beat" (December)

I hope you will enjoy this journey back in time.

DIRK LAMMERTS
PRESIDENT

The Ultimate Messier Object Log

Messier # M092 NGC 4341 Star? Star name

Type: Globular Cluster Magnitude
Name (F. obj): M92 7.5
Constellation: Hercules
Messier Order # 70

RA: 17h 17.1m Dec: 43° 8' Size: 11.2

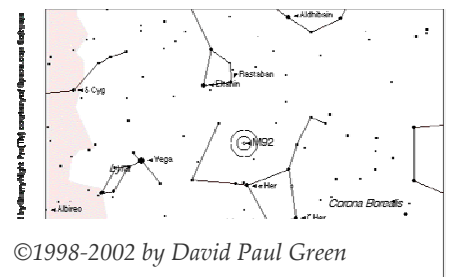
Obj. Atlas: 2009 page: 8 Other: Cluster Page(s) (Star page if star from nearby cluster form)
Messier ID: E Erasmus, T. Deigh, C. de Hollingh, J. De M.
Erasmus, T. Deigh, C. de Hollingh, J. De M.

Personal Viewing Notes

Viewed This Season: _____ Observing Site: _____

Equipment: _____
Sky Conditions: _____ Transparency: _____ Seeing: _____
Observer: _____ Date: _____

Observing Notes: _____



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2008 San Francisco Amateur Astronomers Lecture Series

Free & Open to the Public sfaa-astronomy.org

7:30pm , Randall Museum, Randall Museum Theater, 199 Museum Way, San Francisco randallmuseum.org

April 16th - Nick Kanas, UCSF

“Star Maps: History, Artistry and Cartography”

People have been observing and mapping the heavens since antiquity in an effort to understand their place in the universe. Dr. Kanas will trace the history of celestial cartography from the time of the classical Greeks through the Golden Age of pictorial celestial maps to modern day star atlases. He will illustrate his talk with photographs from antiquarian celestial books and prints taken from his recent book:

[Star Maps: History, Artistry, and Cartography](#)

May 21st - Andrew Westphal, Space Science Lab, U.C. Berkeley

“Stardust: The First Solid Sample Return Mission from Beyond the Moon”

In January 2006, the Stardust mission returned to Earth the first solid extra-terrestrial samples of material collected beyond the Moon. Westphal will report on the most recent surprising results from the analyses, aided by over 23,000 volunteers in the Stardust@home project.

June 18th - Janet Luhmann, U.C. Berkeley

“Space Weather”

Janet Luhmann will talk to us about our Solar dynamo, which is returning to a new solar activity cycle, and how it may affect us, our satellites and those who will venture into space. Join us for this interesting topic.

July 16th To be announced

August 20th - Lynda Williams, Santa Rosa Junior College

“Space Ecology: The Final Frontier of Environmentalism”

Lynda will survey the current space debris situation and speculate on possible future scenarios created by the deployment of space-based weapons, the private space industry and geo-engineering solutions to climate change. As Lynda likes to say: What the world needs now, before it is too late, is an environmental movement in heaven: Space Ecology.

September 17th - Dana Bachman, SOFIA, NASA Ames

“SOFIA : NASA's Stratospheric Observatory for Infrared Astronomy”

SOFIA , a 2.5-meter (100-inch) telescope mounted in a modified 747SP aircraft, is expected to begin scientific observations in spring 2009. Flying above more than 99% of Earth's atmospheric water vapor, SOFIA will have nearly the same access as a space telescope to far-infrared and sub-millimeter radiation from celestial sources. The talk will cover development and testing of SOFIA as well as prospects for some of the exciting scientific observations that SOFIA will make possible.

October 15th To be announced.

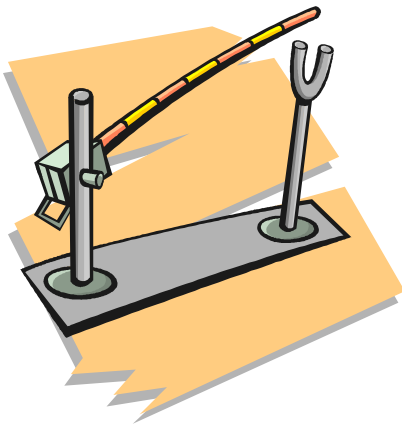
November 19th - Jeff Cuzzi, NASA Ames

“What Have We Learned from the Cassini/Huygens Mission to Saturn”

In this talk, Jeff Cuzzi will review the key science highlights so far on the giant planet Saturn, its spectacular rings, its small but very diverse icy moons, and its planet-sized moon, Titan.

December 17th - Member's Night

Our December meeting features presentations from our SFAA members, plus the annual contests from our members of entries of astronomy art, astrophotography and astronomy literary works. Elections of our volunteers for Officers and Board Members are held on this festive evening.



**GATEKEEPER TRAINING
SATURDAY . MARCH 8TH . 3:00 PM
MT. TAMALPAIS . Pan Toll Ranger Station**

Training is conducted by the Mt. Tam State Park staff and will take approximately two hours.

Snacks will be provided.

Join us for the all-night Messier Marathon immediately following!

Volunteer gatekeepers are needed for both the members only and the public star parties up on Mt. Tamalpais. No, you don't have to sit by the gate the whole time! Basically, you need to make sure that the gate stays closed during the viewing time so the public doesn't enter, and when members want to leave, they need to be escorted to the gate. Generally people are led down in groups so that you only need to go down a couple of times. You'll spend most of your time observing the night sky. So, if you're planning on viewing up at Mt. Tam once or twice this year, why not consider getting trained as a gatekeeper and helping out?

VOLUNTEERS ARE NEEDED FOR THE FOLLOWING DATES AS INDICATED

**MT. TAM
SPECIAL USE PERMIT
MEMBERS ONLY
(Always on a Saturday)**

**MT. TAM
PUBLIC STAR PARTY
(Always on a Saturday)**

**March 8
VOLUNTEER NEEDED**

**April 5
VOLUNTEER NEEDED**

**May 3
VOLUNTEER NEEDED**

**May 31
VOLUNTEER NEEDED**

**July 5
VOLUNTEERS NEEDED**

**August 2
VOLUNTEERS NEEDED**

**September 27 (SFAA Picnic)
VOLUNTEERS NEEDED**

**October 25
VOLUNTEERS NEEDED**

**November 29
VOLUNTEERS NEEDED**

**December 27
VOLUNTEERS NEEDED**

**May 10
VOLUNTEERS NEEDED**

**June 7
VOLUNTEERS NEEDED**

**July 12
VOLUNTEERS NEEDED**

**August 9
VOLUNTEERS NEEDED**

**September 6
VOLUNTEERS NEEDED**

**October 4
VOLUNTEERS NEEDED**

Looking 40 Years Back Toward the Moon

Jim Cottle

“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

This year marks the first of the 40th Anniversaries of the manned flights of NASA’s Apollo Program. In 1968, it was far more difficult to travel to the moon than it would be today, yet it has taken us 40 years to even *talk* about going back. This year the Lunar Reconnaissance Orbiter (LRO), a robotic mission scheduled for October 2008, will be able to peer down on the abandoned hardware of the Apollo Program with maybe enough resolution to make out the Hasselblad camera left on the seat of the Lunar Rover of Apollo 17.

Over the next few months, as the *Above the Fog* newsletter space permits, we will present short reviews of the Apollo flights, their important overall contributions as building blocks toward the goals of the program, and how they appear within today’s rear-view mirror. I hope to share with you some obscure facts that I have uncovered in my need to look back over my own involvement and will interject some personal memories where appropriate. I hope you will enjoy these as they provide a backdrop and distinctive tint to the view. These recollections are uniquely mine and indeed comprise my own personal “*October Sky*”¹. As an impressionable teenager, it was one fantastic first engineering assignment full of wonder, hope and excitement. I am happy that we can celebrate our Country’s accomplishments in these missions that are collectively known as the Apollo Era.

In light of a few reflective facts, our Apollo endeavor was one fantastic accomplishment, far ahead of its time. Today our cell phones dwarf the power of the Apollo Guidance Computer (AGC) with its paltry 38K words of memory and the AGC’s features of aligning the inertial guidance platform are now available personally to anyone performing a two star alignment with Meade’s Autostar II telescope controller. Forty years ago, there was no worldwide communication network similar to the World Wide Web or ubiquitous orbital communication satellites to facilitate the data communication requirements. Each mission’s flight plan and procedure set was revised by hand and *printed*, often several times prior to a launch and resulted in a paper distribution of 1,300 copies and 12 tons of paper for each mission². In terms of employing engineers, technicians and scientists, the Apollo program provided, at its peak 100,000 primary jobs and 400,000 jobs in support roles. Yet, we have only today begun to talk about venturing back to the moon.

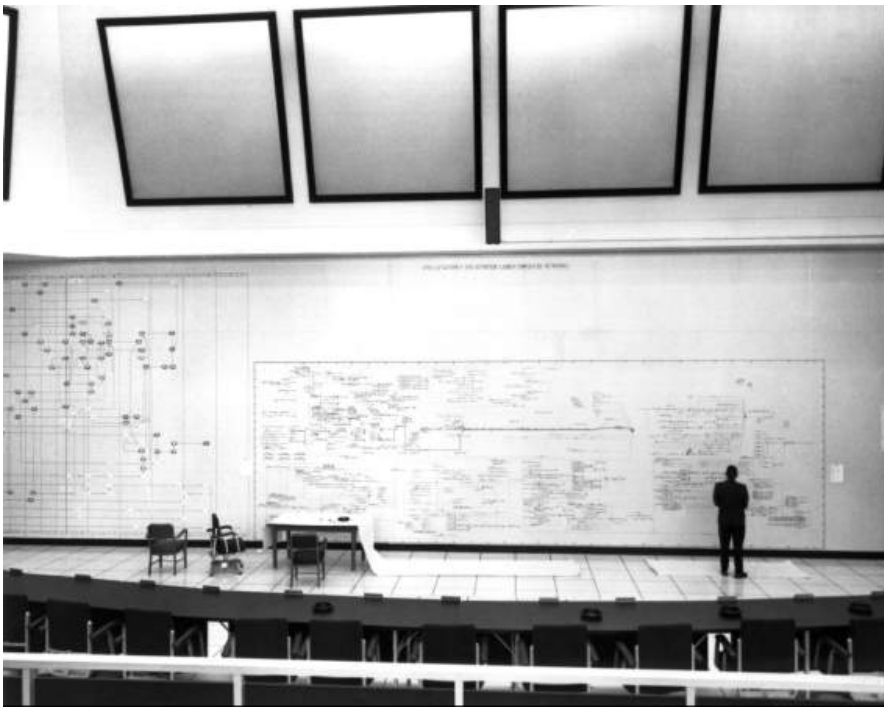
For many in SFAA who are young, these flights must seem the talk of old men’s legends. Indeed I represent that they are³. But for many of us, these flights defined an era, if not the 20th Century and indeed, inspired us with our dreams focused toward peering outward through our mirrors and ground glass with abject wonder at the heavens. The Apollo program generated at least one full generation of mechanical, electrical, chemical and the heretofore unknown “aerospace” engineers, inspired entire careers, fields of research, and aspirations for joining the ranks of the Astronaut Corp, etc. (and you thought it was just “VELCRO”). Apollo changed the way we think about engineering management⁴, drove the development of the MOS transistor toward a more practical reality and dramatically advanced the field of biometrics in our emergency rooms and cardiac units. Little of this was ever classified as with military programs.

¹ Homer H. Hickam, Jr., *Rocket Boys, A Memoir*, Random House, Inc., NY (1998).

² W. David Woods, *How Apollo Flew to the Moon*, Springer-Praxis Publishing, (2008).

³ That is, *IF* you will allow me this vernacular. I have been told that I am not entitled, since I did not properly grow up in a “hood” (with apologies to P-Diddy and other excellent rappers).

⁴ Indeed, Apollo spawned a new field called “Project Management” (how many of you today who use MS-Project, struggle with critical paths, or present PERT charts realize that the first large scale application of this effort was in building Launch Complex 39?).



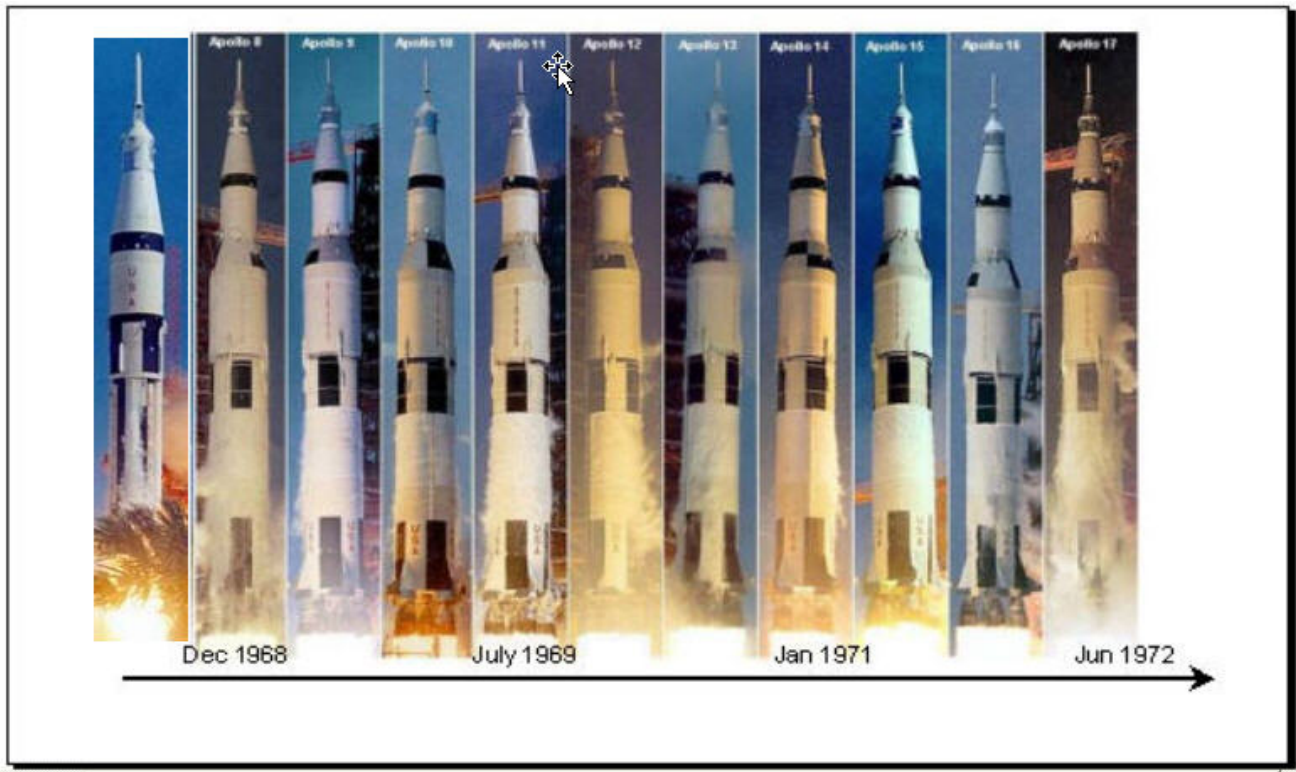
Working the critical path - Firing Room 4 Turned into an early MS-Project PERT chart Window (January 1966)

At the beginning, President Kennedy, at Rice Stadium in 1962, summed up the difficult challenges:

“a giant rocket more than 300 feet tall, the length of this football field, made of new metal alloys, some of which have not yet been invented, capable of standing heat and stresses several times more than have ever been experienced, fitted together with a precision better than the finest watch, carrying all the equipment needed for propulsion, guidance, control, communications, food and survival, on an untried mission, to an unknown celestial body, and then return it safely to earth, re-entering the atmosphere at speeds of over 25,000 miles per hour, causing heat about half that of the temperature of the sun—”,

thereby challenging us to surmount our own sense of personal best, to prepare for a marathon, to run the race for ourselves, for the country *and for him*.

Beginning October 1968, Apollo 7 started a series of continuous, unrelenting manned flights, each building on the other to culminate in our species' only escape from Earth's gravity to date. To get a sense of the aggressiveness of this effort, consider the fact that there were only *nine months time* between Apollo 7 (the first manned Apollo flight on a Saturn 1 booster) and Apollo 11 (the first Moon Landing). *Yet in four short years, it would all be over.*



Manned Apollo Timeline

In less than four years, we traveled to the Moon nine times, six with landings and planted 12 human beings on its surface. For the 36 subsequent years, we would confine ourselves to a relatively circular Earth orbit about as high as from here to Sacramento, peering down on this planet, looking outward and carrying out weightless experiments, radiation etc., and returning via an essentially dead-weight glider.

The Magic of 40 Years

It turns out that 40 years is a pretty magical number in terms of the human experience. In surviving 40 trips around the sun, two young adulthoods, we begin to look around and ask a series of introspective and soul-searching questions. Questions like 1) where am I now and what can I see from here? 2) What steps got me here? 3) Was my journey ethical? and 4) where do I go from here? These questions are also relevant for us collectively as we look back on the Apollo era. Our human history is rich with references to the magic number 40, like 40 days and 40 nights, 40 year mid-life crises, and the time it took the Israelites to exit Egypt (only to peer back down the valley toward Cairo). Let me relate to you my own profound sense of a 40-year trek, one that I experienced when I was an Engineer Trainee at NASA-Kennedy Space Center in Apollo Ground Support Equipment.



Blueline Blues

In 1971, between the launch of Apollo 15 and 16, I left the confines of the KSC headquarters building in a funk. I had had quite enough of copying “blue-line” E and F-size engineering drawings on the third floor and the afternoon was beautiful on Merritt Island. I checked out a government pool car and headed to Launch Complex 39 and the then-vacant Apollo 15 Launch Umbilical Tower (LUT). I had been trained in the appropriate hypergolic propellant safety courses and earned the solo privilege with my green certification badge (I wasn’t paid very much at the GS-4 level and this was one of the perks). This badge was punched with certain conditions under which I could venture to the pad. The status of a NASA-KSC employee was directly related to how many auxiliary badges resided underneath the overlay of the official NASA ID (I had one). Almost everyone had a red border to his or her ID, which meant a secret security clearance. Only the astronauts carried the status of yellow, top secret designations, along with certain of the center directors. Their status

would be downgraded to red after Daniel Ellsberg leaked *The Pentagon Papers*, in 1971 and really ticked off President Nixon.

I could see the road traveling beneath me through the rusted floor of the “International Scout” as I drove towards the VAB. I liked driving the Scout, it was a little more my style than the typical NASA/GSA Dodge Dart. Presumably, one could take it out on the dunes with its four-wheel drive, although then you would be quickly peddling with your feet through the rusted floorboard like Fred Flintstone. Also, I am sure that my supervisor, Keith Jenkins, would laugh like crazy but NOT appreciate the inevitable call he would get from the security guards if I performed such a stunt, which would have been typical for the time. When I arrived at the foot of the pad, I headed through the base of the Launch Umbilical Tower (LUT) and up the gantry elevator to the 320-foot level.

The 320-foot level of the LUT after a launch was a very peaceful and spiritual place. Through the gantry, the warm gentle humid breeze provided much needed relief from the ammonia smell of the blueprint copier and it was *unbelievably quiet*, with only the gentle rolling sound of distant crashing of waves on the beach from the Atlantic Ocean. This was the kind of meditative silence where, in a church, you are encouraged to search inward. Looking due south from this point, I realized for just a short minute that I was standing on top of quite a sacred spot: manned spaceflight’s altar of worship. As far as my eye would allow, I could see all of the historical steps stretched out before me, from the Saturn V, to the Saturn 1, Titan, Atlas, Delta, Thor, Redstone, Bumper-WAC (a repatriated V-2). To use the title of a NASA publication on the Gemini Program, I was standing on the shoulders of Titans⁵ at the spot of departure for the first truly designed booster for manned spaceflight. All the rest were designed as military weapons before they were space vehicles.



⁵Barton C. Hacker and James M. Grimwood, *On the Shoulders of Titans: The History of Project Gemini*, NASA SP-4203, (1977), available on-line.

The gantries of ICBM row were just starting to be dismantled for scrap but they were all still visible, including the distinctive 60 foot parabolic dish of the old "Mercury Control Center" now parked in a rusted permanently vertical position. After the Mercury flights, mission control was moved to the Johnson Space Center in Houston. I was looking back in time over roughly *40 years* of engineering progress toward space exploration. All of mankind's collective dreams of leaving the earth for adventure were stretched out before me. Visions inspired by the paintings of Chesley Bonestell, the movie *Destination Moon* and Disney television all welled-up from the fifties. These now drove my emotions and thoughts in the meditative silence. At this date, we had reached the moon four times with eight human beings having experienced that goal, first hand.

The gantries were physically smaller as they stretched further south toward Cape Canaveral, further back in time and were, from here, set up like dominos to get us where we were. They matched in size the progressive advance in rocket power with the four or so decades. In fact, the escape tower atop the Apollo command module was every bit as powerful as the original Mercury Redstone that took Astronauts Shepard and Grissom on their suborbital flights in the early '60s.

Then I began to prematurely ponder the answers to those introspective questions: 1)Where was I? - I was standing on the departure point of man's dreams of leaving the earth staring down the line toward the origins of the effort, 2)What could I see? - Those gantries represented the steps that got us here to this very spot, 3) Did I arrive here ethically? Well...that copier room DID smell bad! and finally, 4) Where do I go from here? I guess I should get back to work! Such was the limited introspection of an 18 year old.

For many of us who grew up in the 50s and 60s, the understanding was that the target of the moon was just the first step toward greater travels. Certainly that was true for the majority of engineers I was working with at NASA in the Apollo Program in the early 70's. We honestly believed that, if we could make it to the Moon, Mars would be next. Lulled by the aggressiveness of the Moon landing goal, and the exemplary teamwork required, we were aghast at the cuts in the program. Following the "fast burnout" of actually reaching the goals of landing, and several close calls, the abrupt downsizing and cancellation of the truly scientific flights (Apollo 18, 19 & 20) caused a great deal of lost future in our eyes. Many in the program were already re-assessing their commitment in 1971. In particular Frank Biggs, a well-respected and excellent engineer in my group, had announced he would be leaving NASA to go run a chain of Laundromats?! To use a surfing analogy, I had not quite caught the wave.

But I was one lucky teenager. Although I had not helped "bake the cake" of Apollo, I certainly wanted to "lick the beaters". Culminating in years of effort, at the beginning of my career I got to spend three of the four years of manned Apollo at Kennedy Space Center. From my perspective, this departure point was the best scientific show that central Florida, indeed anywhere had to offer.

Wyn Wachhorst wrote

"The Apollo missions to the moon defined an age. They were the dreams of the child in man, less out of the ethic of work, than the spirit of play, less out of means than a search for meaning. We search to locate the essential center by looking around the edges."⁶

We did not have the expected experience of the fifties in our travels to the Moon. We were collectively like children at the beach toying with the boundary of the seashore and running back to the certain safety of the earth. Apollo demanded that we see and acknowledge how comfortable our "beach" really was. We learned that the ocean that was the Moon could be quite foreboding for manned crews playing with this boundary. In this sense, Apollo pushed that envelope to the limit of what we could do for the time. Far ahead of its time its sustainability was not considered. After approximately 40 years of engineering effort, we profoundly gazed back down the valley and saw... *ourselves*. In short, it was *dangerous play*, and the missions that flew during the 1968 to 1972 period would prove this out in spades.

Next: We review the robotic missions to the moon, the development of the Saturn vehicle leading up to Apollo 7 in October (the first manned Apollo flight). Two months later, we made an aggressive step ending 1968 with a Christmas Eve's first look back on ourselves, Apollo 8.

⁶ Wachhorst, Wyn, *The Dream of Spaceflight*, Basic Books, New York (2000).

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Recent cosmological observations have provided an extremely puzzling insight into the nature of the universe. 95% of the universe's contents are invisible or "dark", with 25% being "dark matter" and the majority in a mysterious form labeled "dark energy". Understanding the origins of the dark universe is requiring collaboration between theorists and observers, and between astronomy and fundamental particle physics and represents one of the major challenges in physics today.

2007-2008 MEMBERSHIP DUES

SFAA membership now comes due in June. Before now, dues were payable in the month a member first joined. Last year, the SFAA board voted to make everyone's dues payable at the same time - in June of each year. This was done for two reasons: 1) to save a great deal of work for our volunteer Treasurer, present and future, and, 2) for the convenience of members - it's easier to remember! In the past, many members forgot their due date and their membership unintentionally lapsed.

During this first year of transition: If your present membership runs past June 2007, just pay a prorated fee to extend your membership to June of 2008. Simply deduct 1/12 from this year's dues for each month already paid. For example, if you last paid your membership in September of 2006, you have a credit of three more months. Subtract 3/12 (1/4) from your annual fee and just pay that amount. We trust your math. Next year, and every year thereafter, everyone will pay only in June. Easy!

We realize this conversion process may be a bit confusing and more work for some. But this is a one-time transition and it will lessen the work and confusion for all the years to come!

N.B. for those of you who have a club discounted *Sky and Telescope* magazine subscription, you will need to renew your subscription separately. The magazine will send you a renewal notice. In the past, you had to send that renewal notice with payment to the SFAA; now you can mail your *Sky and Telescope* subscription renewal payment directly to *Sky and Telescope*. **Note: Not renewing your club membership on time may mean your magazine subscription(s) will also terminate.**

Thanks for bearing with us during this transition process -- it'll all seem worth it next year! Just complete the membership form on the last page of the newsletter and submit with your renewal check to:

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