



ASSOCIATES

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October 2019

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MARS STAR



Our Group Banner at the Game



MARS Activities This Quarter:

- **Holiday Celebration** — Dec 4, 2019, page 21
- **Dinner Club** — pages 23 - 28

MARS Associates: A Social Club for Retirees of Lockheed Martin & United Launch Alliance

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REMINDER:

If you move, please give the membership VP a change of address. Also, if you are a snowbird, let us know when you are leaving and when you plan to return so your MARS STAR can be sent to you. It costs us 70 cents for each STAR package returned.

(Published quarterly by MARS Associates, Retirees of Lockheed Martin Corporation and United Launch Alliance, Denver, CO)

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IMPORTANT PHONE NUMBERS

LM Employee Service Center	1-866-562-2363
Lockheed Martin Savings Plan Call Center	1-833-562-4015
Aetna Plans	1-888-562-8111
Anthem BlueAdvantage HMO	1-866-863-0484
CIGNA Point of Service (POS) (Hourly Only)	1-800-832-3211 1-800-224-6224
CIGNA Healthcare of Colorado for Seniors	303-782-9662
CitiStreet (PSP-SSP-CAP)	1-833-562-4015
Medicare Plus (Aetna)	1-888-562-8111
PacifiCare Secure Horizons	1-800-771-4347
CVS Caremark Prescription Drugs	1-888-562-3784
Vision Service Plan, Rancho Cordova, CA	1-800-877-7195
Kaiser Permanente	303-338-3800
United Dental Health	1-866-487-9301 1-855-868-4955
Delta Dental of Colorado Individual Team	1-800-610-0201 1-877-516-6512
	Individual@ddpo.com
AssuredPartners of Colorado LTC/Vision/Dental Jon Elmore	303-863-7788 jelmore@assuredptrco.com
Via Benefits	1-844-596-0460

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MARS Website: <http://www.marsretirees.org>

Cover:

- L:** Annual MARS at the Rockies Picnic and Game was on Wednesday, July 31.
- R:** Encapsulation of GPS III SV 02 on a Delta IV prior to a successful launch and deployment. See the Lockheed Martin (LM) and United Launch Alliance (ULA) News articles.

From the Editor's Desk

Tom Pighetti (tjpighetti@q.com)
Linda Stearns (linda80120@comcast.net)

For comments or corrections, contact Tom (issue editor) or Mike Carroll, V.P. of Communications.

MARS welcomes your submissions. Submissions must be relevant **to the MARS organization**, informative, and **appropriate for this newsletter**. No **personal dialogues or opinion pieces** will be accepted.

Please submit your article for approval **in advance** to the V. P. of Communications. Articles will be included as time / space allows.



President's Corner

By Dan Ellerhorst
(dan.ellerhorst@gmail.com)

Summer is now over and we had three very successful events that those of you unable to attend in person can experience through the July and October editions of the MARS STAR, and also via our website, where webmaster Jim Kummer has assembled some very nice slide shows. In July, we held our annual Senior Recognition luncheon at Pinehurst, followed by the MARS Day at the Rockies. And a few weeks ago, on another beautiful late-summer day, we had our annual MARS Picnic at Clement Park.

One of the features of the MARS picnic (along with the great BBQ from Bennett's) is the drawing for the door prizes. This year we had a variety of gifts and gift-cards from our vendors at Assured Partners, Delta Dental, and Perfect Time Tours. In addition, the MARS Dinner Club provided three gift cards to area restaurants and MARS Associates provided a number of the ever-popular "cash awards", including the Grand Prize of \$300. Check out the pictures of all of our winners later in this edition of the STAR. Congratulations to all of them, and especially Jill Demchak, the winner of the Grand Prize!

One of the challenges the club leadership has been working on is the feasibility of providing an online capability for paying MARS annual dues, event registrations, and club activities. This was requested by a number of members in last year's survey as well as other personal contacts. Steve Sande has been very helpful in assembling information about the available technologies, and lively discussions have been held with a committee composed of representatives from the dinner club, the web committee, the officers, and directors. Taking into account cost, security concerns, and the varying levels of comfort our membership has with online services, we are going to try some small steps in the coming months.

Eventbrite is an online capability for setting up events, tracking RSVPs, and collecting menu selections and money from attendees. I am sure many of you have already used it for other activities. It adds a significant cost (about 10%) to fee-based events, but no added cost for free events. We are going to use it (as a beta test) on our upcoming Second Happy Hour in October.

As the Happy Hour is scheduled for October 9th, it will have occurred by the time you read this. But, this is a low risk, no cost, way for us to get some experience with Eventbrite and see how a subset of the membership likes it.

In a similar vein, we are planning to provide a Paypal based option for membership RENEWALS only. Paypal adds a nominal cost (less than a dollar) to the credit card transaction, which the club initially plans to absorb. New members will still have to use the paper based application, until we get better at collecting all the necessary data online (something we hope to gain more experience with via the Renewal beta test). Please give me (or any officer or director) your feedback, both positive and negative, on these initiatives.

For now, we are not changing the way we do our recurring events and other club activities. In the future, if our beta tests are successful, we may offer more options for online payment. In any event, we are committed to continuing to allow members the option to sign up and pay for things using the traditional paper form and check method.

As usual, I hope to see you at a future event!



Activities Updates

By Linda Duby
(lindaduby@comcast.net)

On July 10, MARS held the Senior Recognition Luncheon at Pinehurst Country Club with 117 members and guests attending. The format was different this year since we opened up the event to all members and honored the senior members. Also, different this year was having a speaker at the event; MARS was very fortunate to have Beth Buck, Lockheed Martin Manager, Deep Space Operations, give a very informative and interesting presentation on deep space exploration programs at Space Systems. Pictures of the Senior Recognition Luncheon were included in the July edition of the STAR.

The annual MARS at the Rockies Picnic and Game was on Wednesday, July 31. Sixty members and guests enjoyed the catered picnic of hot dogs, brauts, grilled chicken legs, potato salad, chips, cookies with unlimited fountain drinks, and several took advantage of the cash

bar. Janice Redfield won the gift certificate for 4 tickets to a future Rockies game. We were disappointed as the Rockies lost to the Dodgers but have high hopes for next year. Photos are posted here-in and on the website.

The next successful event was the Annual Picnic on September 11. It was held at Clement Park and the food was catered by Bennett's. We had a good turnout – 231 members and guests attended. Bennett's did a great job with the food and the service again this year. The vendors who offer services to MARS members were in attendance along with the MARS clubs being represented this year. Hopefully, everyone had a chance to visit with the vendors and the clubs. Congratulations to all the prize winners! Check out the pictures in the back of the STAR.

Next up is the Holiday Celebration on Wednesday, December 4, 2019 at Pinehurst Country Club. The doors open at 11:00 a.m. with the cash bar and lunch served at 12:00 noon. The flyer with the menu and more details is enclosed in this STAR. Please check it out and have your reservation submitted by November 26, 2019!

The National Western Stock Show is again offering a MARS day and discounts for various weekday rodeos. MARS day will be on Friday, January 17, 2020 at the 1:30 p.m. rodeo. The Stock Show staff is preparing a flyer for MARS which will be posted at a later date. The flyer will have links to purchase the discounted tickets for the 2020 National Western Stock Show. Watch for the flyer on the MARS website and on the MARS Facebook page.

- Assured Partners (Electric Toothbrush and two \$50 Gift Cards from Panera Bread);
- Delta Dental of Colorado (complete Electric Toothbrush set); and,
- Perfect Time Tours (a basket with \$150 gift card and goodies).

Cyber Security & ID Theft Presentation – A special thanks to Steve Sande, a very active MARS member participant, for giving an excellent presentation on Cyber Security & ID Theft on Sept. 17th for our MARS members at the Red Rocks Corporate Credit Union Office. The presentation covered identity theft, phishing, phone scams, network security, password security, fraud alerts and how to prevent being hacked or compromised. Many in attendance came up to me afterwards and said that was the best education they had received on security and ID thefts. Thank you, Steve!



Steve Sande presents Cyber Security & ID Theft information



MARS Attendees focus on Steve Sande presentation



Business

By Sherry Vargo
(shervargo@comcast.net)

Vendors at the MARS Picnic –Thank you to the vendor representatives from Delta Dental of Colorado, Vision, Hearing Rehab Center, Red Rocks Credit Union, Assured Partners, Perfect Time Tours, Aetna Health Insurance and Kaiser for attending our annual picnic and providing information and give-away to the MARS members. A special thank you for the door prize donations:



Membership Report

By Carl Kaminski

(carlcolo@centurylink.net)

MEMBERSHIP STATISTICS

As of September 1, 2019, there are 1,347 MARS Associates members, including 719 seniors.

Please welcome the following new members:

Colorado

Arvada	Debby & Ron Del Valle, Robin Zen & Mark Nash
Aurora	Alan & Elsa Schaefer
Broomfield	Ron Boxler
Castle Rock	Sue & Gary McIntyre
Centennial	Lino & Mary Salvador
Denver	Don & Ann Speranzini
Evergreen	Don Tracy
Highlands Ranch	Terry & Eva Lillibridge, Art & Donna Howe, Steven & Darlene Egan, Harry & Lucette Kottcamp
Littleton	Joe Runkle, Don & Lynae Foley, Kelly & Lynne Forrester, Edwin & Kathy Barnes, Scott & Teri Gummere, Scott & Carol Burroughs, Lyle Weilnau
Parker	Doug & Diane Gilbert

Other States

UTAH

Saint George Scott & Kaylene Harman

MEMBERSHIP RENEWAL

As mentioned in the President's Corner article we are planning to provide an on-line option for membership renewals this upcoming renewal cycle. In parallel with on-line renewal, we will also offer the option of

confirming your membership information via email for renewals -- more to follow on this following beta testing. Regardless, the option to renew via a paper copy and check will remain available.

Thanks to all of you who provided a timely change of address. Much appreciated! For those of you who are moving in the future:

Please provide a change of address so we can keep your STAR headed to the proper location. If you file a change of address with the post office, MARS has to pay a fee when your STAR is forwarded and for the change of address notification! **We pay as much for this as for the original mailing!** Please let us know in advance so we can get your address right the first time.

"Snow Bunnies" remember to let us know when you will travel to your seasonal residence! Where your STARS are mailed depends on you keeping us informed—standard mail is not forwarded for temporary address changes. Thanks!

Change of email address or phone number?

Please remember to include the MARS membership team in your list of people to notify when you have a new phone number or email. We want to make sure all of your communications are timely.

In Memoriam

By Norma Emerson

(emer801@msn.com)

Please contact me at the above e-mail address or at 303-646-1137 with information about the passing of a member, the spouse of a member or other MM/LM retirees so they can be acknowledged in the *In Memoriam* section.

Members

Bett, Juanita (D: July 2019)
Denver, CO
No obituary published

Coppock, Arthur (D: July 2019)
Nowata, OK
<https://www.tinyurl.com/yy2cmts7>

McGown, Roy (D: July 2019)
Littleton, CO
<https://tinyurl.com/y4btm63e>

Pacheco, Julianita (D: July 2019)
(Survived by Rafael "Ralph" Pacheco)
Thornton, CO
<https://tinyurl.com/y5ropqzs>

Phelps, Judy D. (D: July 2019)
Littleton, CO
No obituary published

Strand, Janice E. (D: March 2019)
(Survived by Douglas Strand)
Littleton, CO
<https://tinyurl.com/y49qxhan>

Non-Members

Chetelat, Larree (D: June 2019)
Survived by Donna Chetelat
Littleton, CO
<https://tinyurl.com/y6xpjf2m>

Llewellyn, Larry (D: June 2019)
Colorado Springs, CO
No obituary published

Meyer, Holly (D: July 2019)
Georgetown, TX
(Survived by: Mike Meyer)
<https://tinyurl.com/y4vplcbh>



VOLUNTEERING WITH SECOND HELPINGS

By Mike McKaig

Second Helpings is a group of 100+ caring volunteers that pick up & distribute a variety of nutritious food items donated by 21 grocery stores, restaurants and other businesses in the Littleton area.



Volunteers with Second Helpings

Based in the lower level of the Light of the World Church - on Bowles near Kipling - the gathering, sorting, distribution and deliveries are made to ten different non-profit agencies serving the poor and homeless. There is also a food bank on-site serving nearly 400 needy families with children.

Sue & I have helped with this for well over 10 years & find it very fulfilling. A typical run for us is loading up a shopping cartful or two from Safeway at 8:15-ish. Then drive over to the church where helpers take it inside for sorting, etc. They then bring out & load boxes of food for us to take to a preparation site near downtown Denver. The volunteers there wash, cut, slice, chop, & cook the food for the 300-400 meals they serve to the homeless that afternoon. We're usually done by 9:30-9:45.

The group is very well organized; schedules are distributed via email for the next two months. Temporary adjustments are usually accommodated with a "Can someone cover for me next Tuesday" type email.

Any level of help is greatly appreciated, even one day a month. Two hours is sufficient to complete a pick-up and delivery and no special vehicle or heavy lifting is required.



Our Honda Fit had plenty of capacity



When filled with baked goods the aroma is amazing!

Without the Second Helpings volunteers the donated food would likely end up in a landfill instead of feeding literally hundreds of people every week.

For more information contact John Walsh at 303-973-3969. He will be very happy to hear from you!

Historian's Corner

By Barb Sande
MARS Facebook Page Historian
(barbsande@comcast.net)

Program Profile

This issue's profile is of the first lunar landing, the Apollo 11 mission. The 50th anniversary of this phenomenal mission occurred in July of 2019. Heritage company contributions to the Apollo program are also listed. To save space in the MARS STAR, future Historian Corners will feature either a program profile or a History on the Road article. Historical information and program updates are always available on the MARS Associates Facebook page. No History on the Road or quiz question is included in this edition, due to the length of the program profile.

Apollo 11 Mission



Apollo 11 Crew -- Commander: Neil. A Armstrong (left), Lunar Module Pilot: Buzz Aldrin (right), Command Module Pilot: Michael Collins (center) (Photo Credits: NASA)

Launched: 07/16/1969 09:32:00 AM EDT LC-39A
Splashdown: 07/24/1969 12:50:00 PM EST, Pacific near Wake Island, USS Hornet recovery ship
Saturn V AS-506 Launch Vehicle
Translunar Trajectory
30 lunar orbits

Landing site: Sea of Tranquility, located at lunar coordinates 0.71 degrees north, 23.63 degrees east
CSM Call Sign: Columbia (CSM-107)
LM Call Sign: Eagle (LM-5)

On June 26, 1969, George E. Mueller, Associate Administrator for NASA (Office of Manned Space Flight), and USAF Lt. General Sam C. Phillips signed and released the primary Apollo Program mission objective in document M-932-69-11, which stated succinctly: "Perform a manned lunar landing and return". A month later, the millions of derived requirements and specifications, test and mission protocols, design solutions, contractor deliveries, and crew resources that came from this simple primary objective were met in the successful launch, lunar orbit/landing, and return of the Apollo 11 mission.

A personal note: I was 13 years old that summer and this event occupied my time above and beyond anything else that our family had planned. I saw the launch at a motel in Yuma, Arizona while on a family vacation (yes, it was hot there!). We got home to Colorado before the landing in the early afternoon on July 20 and I paced the living room waiting for confirmation of success and, to this day, still get tears in my eyes remembering the speechless reaction of Walter Cronkite and the cheers in Mission Control when the Eagle landed. That evening, we all gathered in front of the TV (along with 650 million people worldwide) and watched in awe the first walk on the moon by Armstrong and Aldrin. I knew at the moment, that I wanted to be an engineer or scientist and work in the space program. Girls didn't become engineers or scientists in those days, but I was not going to let that stop me! I will have more of this personal story when I profile the Apollo 15 mission in a future historian corner.

Back to the Apollo 11 story: Two hours and 44 minutes after a picture-perfect launch on July 16, the Saturn IVB engine re-ignited for a second burn to place Apollo 11 into a translunar trajectory. The CSM Columbia rotated, the crew retracted the LM Eagle, the IVB stage was jettisoned, and the crew was on their way to the moon. Only one of the four planned midcourse corrections was required during the translunar coast. The LM was accessed by Aldrin and Armstrong on July 18 for checkout and the Service Propulsion System (SPS) orbital insertion burn on July 19 placed the two spacecraft into lunar orbit (the finalized elliptical orbit was 62 by 70.5 nm).

Armstrong and Aldrin climbed into the LM for the second time on July 20 and separated from Columbia. Mike Collins was on his own now, for the duration of the descent, landing and return of Eagle. The LM entered a highly elliptical orbit first (almost identical to Apollo 10),

then the descent engine was fired for 756 seconds to start the final descent to the orbital location known as "high gate" (26,000 feet in altitude and five miles from the landing site).

The hair-raising descent of Eagle is recalled by those who watched the events or were directly involved, or if you read the superbly detailed Apollo Flight Journals. There were several flight computer memory "overflow" errors that were quickly assessed as non-critical (the now-famous 1201 and 1202 alarms, due in part to spurious data from rendezvous radar) and Mission Commander Armstrong had to take manual control of the LM during the final minutes of the landing to avoid a large crater. At this point, the mission was less than 30 seconds away from the critical Bingo call, which would have required a hard landing and quick ignition of the ascent stage due to fuel depletion in the descent stage. At 102 hours, 45 minutes into the flight, Armstrong spoke the historic words "Houston, Tranquility Base Here – The Eagle has Landed"; future Apollo 16 astronaut Charlie Duke (CAPCOM) responded, in his laconic southern accent: "Roger, Tranquility, we copy you down on the ground. You got a bunch of guys about to turn blue. We're breathing again. Thanks a lot!"



Apollo 11 Lunar EVA: July 20, 1969

After landing, the decision was made to accelerate the egress and surface activities and postpone a planned rest period. The post-landing and EVA preparations still took several hours. Finally, Armstrong emerged from the LM, carefully descended the ladder, and at 109 hours, 23 minutes elapsed time into the mission, he spoke those amazing words that we all remember: "That's one small step for [a] man, one giant leap for mankind". Twenty minutes later, he was joined by Buzz Aldrin ("Magnificent desolation"). The EVA, which was more than 2.5 hours long, consisted of sample gathering, deployment of the flag, deployment of the EASEP (Early Apollo Scientific Experiments Package), ceremonial activities, including a live call to the astronauts on the surface from President Nixon, and the taking of many photographs by Commander Armstrong

(a second Hasselblad camera was left in the LM). Two of the CAPCOMs during the lunar surface activities included Bruce McCandless, who would later fly the MMU built by Martin Marietta and work for Lockheed Martin, and Ron Evans (CSM pilot on Apollo 17).

After the crew returned to the LM, they had a seven-hour sleep period, then prepared for the ascent from the lunar surface. At 124 hours and 22 minutes into the mission, the ascent engine on Eagle fired and the complex rendezvous process with the CSM and Mike Collins began. Four hours after this process began, Collins took control for the final few seconds of rendezvous and docking and the two spacecraft were together again. The two moonwalkers returned to the CSM and Eagle was jettisoned four hours after docking.

Trans-Earth injection began on July 21, with a CSM SPS engine burn for 2.5 minutes on the far side of the moon, on the 59th orbit by Columbia. All three astronauts, after this crucial event, slept for 10 hours. Only one course correction burn was required during the return flight and the astronauts had two television broadcasts, thanking the many people who worked on this program for its success.

Re-entry procedures were initiated on July 24. The SM separated from the CM, oriented for proper entry with heatshield down, and 195 hours, 18 minutes, and 35 seconds after liftoff, Apollo 11 splashed down 13 miles from the recovery ship USS Hornet. The splashdown zone was changed late in the re-entry process due to weather in the primary zone.



Mission Control after splashdown, 7/24/1969

The astronauts donned contamination suits and were quickly brought on board USS Hornet. President Nixon and some of his key advisors were present on the ship. The crew was escorted into the Mobile Quarantine Facility, a converted Airstream trailer and their home for almost three weeks to ensure no contagions were brought back from the moon. The Mobile Quarantine Facility was flown to Houston; after the crew was released, they went on a massive publicity tour in many states and to 22 other countries and addressed joint Congressional sessions. The Apollo 11 Mission collected 22 pounds of samples from the lunar surface, including 50 rocks of various sizes. More than 100 scientific papers were released in the next six months documenting the first results of lunar material analysis.

Crew biographies

Neil A. Armstrong was born near Wapakoneta, Ohio, on August 5, 1930. He was educated at Purdue University and was a naval aviator, seeing action in the Korean War. He became a civilian test pilot, flying many experimental aircraft, including the X-15 (seven flights). He was selected as an astronaut by NASA in September, 1962. He commanded the Gemini 8 mission with pilot Dave Scott, who later commanded Apollo 15; they were put to the test when the Gemini spacecraft began rotating wildly after docking with the Agena upper stage, requiring the mission to be aborted. He was offered the Commander role on Apollo 11 when Apollo 8 was in orbit around the moon. After the Apollo mission, Armstrong went into teaching at the University of Cincinnati, supported the failure investigation teams for Apollo 13 and STS Challenger, traveled to the North Pole, and did advertisements for a few companies including Chrysler. He also served on the boards for several corporations. He was married twice and had three children (daughter Karen died at the age of 2 from cancer). Armstrong passed away on August 25, 2012 from complications following coronary bypass surgery. He received numerous awards and citations and authorized a biography "First Man: The Life of Neil Armstrong", published in 2005 (and the basis for the 2018 movie).

Buzz Aldrin (born Edwin Eugene Aldrin, Jr. on January 20, 1930) is from Glen Ridge, New Jersey. He graduated from the West Point Military Academy in 1951 and chose a career as a fighter pilot in the newly formed Air Force and flew 66 combat missions in the Korean War. Aldrin enrolled as a graduate student at MIT and earned his doctorate in astronautics in 1963. His thesis was entitled: "Line of Sight Guidance Techniques for Manned Orbital Rendezvous". Aldrin was selected as one of 14 astronauts in the third astronaut class in 1963. His first mission was on the final Gemini flight with Jim Lovell (Gemini 12), where he performed three EVAs outside the spacecraft. Aldrin was assigned the LM Pilot

role on Apollo 11. In 1971, he left NASA and returned to the Air Force, becoming Commandant of the USAF Aerospace Research Pilot School. He retired from the Air Force in 1972 and suffered for years from alcoholism and depression (his mother and grandfather had both committed suicide). He wrote two books about his astronaut experiences and mental health struggles ("Return to Earth" and "Magnificent Desolation"). He has been married three times and had three children with his first wife Joan; in 2018, he was involved in a legal dispute with his children over his mental state and financial status but the legal dispute was dropped by his family early in 2019. He currently spends time traveling and advocating missions to Mars. My husband and I met Buzz on an eclipse cruise in the southern Caribbean in February 1998. We spent quite a bit of time talking to him after dinner one evening after I asked him what it was like to ride on a Titan II (he liked the uniqueness of that question). We also attended some of his lectures on the Mars cyclor concept that he created due to his expertise in orbital mechanics.

Michael Collins was born in Rome, Italy, on October 30, 1930. His father was a career Army officer. He graduated from the West Point Military Academy in 1952 and decided to join the Air Force, as many family members were in positions of significant influence in the Army. He trained in F-86 Sabre aircraft and was assigned to flying duties in Europe. In 1960, Collins applied for the Experimental Test Pilot School at Edwards Air Force Base and was accepted, flying a number of different air craft and later being accepted into a postgraduate program studying spaceflight. He was selected as an astronaut with the third group (14 total) in 1963. His first space mission was on Gemini 10 with Commander John Young and they conducted many successful experiments including rendezvous and docking maneuvers, as well as limited EVAs for Collins. He moved on to the Apollo program and was a CAPCOM on the Apollo 8 mission, then was assigned to the primary crew for Apollo 11, as the Commander Module Pilot. After Apollo 11, Collins left NASA and worked as the Assistant Secretary of State for Public Affairs; he left this role and became the director of the new Smithsonian Air and Space Museum and did other functions for the Smithsonian. Collins also worked as a Vice-President of LTV Aerospace. His autobiography "Carrying the Fire: An Astronaut's Journeys" was critically acclaimed. His wife Pat (they married in 1957) passed away in 2014; they had three children.

References for Apollo 11 article and program profile bonus.

Apollo Flight Journal: <https://history.nasa.gov/afj/>
Apollo Program: <https://go.nasa.gov/2bfU3gu>
Apollo 11 Pages: <https://go.nasa.gov/1K3YjY0>

Apollo Press Kits:

<https://www.apollopresskits.com>

Saturn V Subcontractors:

<https://go.nasa.gov/2Yf6y1b>

Major Spacecraft Component Manufacturers:

<https://go.nasa.gov/33460xl>

Wikipedia (source of biographies):

<https://www.wikipedia.org>

General Dynamics Press Release:

<https://gdmissionsystems.com/space/apollo11>

PROGRAM PROFILE BONUS

Listed below are the system and component contributions to the Apollo program from LM Heritage companies (Martin Marietta, General Dynamics, Lockheed Space, General Electric, and RCA). NOTE: This list is based on exhaustive research and omissions may have occurred due to inadequate available on-line information. Corrections and additions are welcome!

Martin Marietta:

Apollo Lunar Surface Drill (ALSD) – used on missions 15-17

Helium Bottles (subcontract to Boeing for Saturn V First Stage)

General Dynamics (legacy company Motorola Government Electronics Division):

S-Band Transponder (Unified system/LM communication systems)

Flight Data/Command Receivers

C-Band Transponder

Lockheed Space (Propulsion, Electronics Divisions):

Pitch Motor

Launch Escape Motor (major subsystem)

Cold Cathode Gage Instrument (lunar surface experiment package)

Real-Time Analysis System

General Electric Apollo Systems Division:

Spacecraft Acceptance Checkout Equipment (ACE)

Launch Vehicle Electrical Support Equipment (ESE)

Launch Control and Checkout Equipment (LCCE)

Electronics components (subcontract to Boeing for Saturn V First Stage)

RCA:

Ground-commanded Color Television Assembly

Lunar Communications Relay Unit

Laser Altimeter

Lunar Sounder Radar

LM-S-Band Communications (with GD)

LM Guidance (with Honeywell)

VHF Communications, LM-CSM

EVA Communications System (Backpack Radios)

Erectable Antenna

Rendezvous Radar/Transponder

LM Landing Radar

LM Descent Engine Control Assembly

LM Attitude Translation Control Assembly

Saturn Countdown Computers

Tracking Radar Support for Apollo

Black & White Television Cameras

LM Guidance (subcontract to Grumman)

On This Date in History

This section has milestones retrieved from publicly available information for LM, ULA and heritage programs from 10 to 60 years ago (2009, 1999, 1989, 1979, 1969, 1959). Delta launches prior to the formation of ULA, unless it included an LM or heritage company payload or upper stage, are not listed. No classified programs are identified, even if the program is now considered unclassified. The events reflect milestone activity in the quarter previous to the release of the MARS STAR -- where appropriate, key press releases are also included; significant milestones are in bold. The order has been changed since the last MARS STAR to show decadal events under each month heading. There will be gaps if no events occurred in that decadal year for that month (for example, no relevant milestones were found for July, 1989 and July, 1979). The list is not intended to be all-inclusive due to historical record inaccuracies.

NOTE: The very bad year of 1999 continued for LM with the loss of Mars Climate Orbiter (MCO) at Mars orbit insertion on September 23, 1999. MCO was built in Denver and launched in December, 1998. The spacecraft disappeared from communications and its ultimate fate is unknown; the cause was attributed to a navigation error due to thrusters on the spacecraft measuring their output in English versus Metric (SI) units. The accumulating navigation error was seen but discounted during the coast phase of the mission.

Events in July (10 to 60 years ago)

- 07/15/2009: STS-127 (Endeavour) launched, LC-39A, KSC to ISS; small satellites included
- 07/30/2009: LM Press Release: Lockheed Martin-build Trident II D5 Missile Achieves 127 successful flights [noting the May 26, 2009 launch]
- **07/23/1999: STS-93 (Columbia) launched, LC-39B, KSC; Chandra X-ray Observatory. Control and fuel leak anomalies during ascent.**
- **07/20/1969: Apollo 11 mission launched, LC-39A, KSC. First lunar landing (see program profile this edition).**
- 07/24/1969: Classified launch by Thorad-SLV2H-Lockheed Agena-D, SLC-3W, VAFB

- 07/31/1969: Classified launch by Thorad-SLV2H-Lockheed Agena-D, SLC-1W, VAFB
- 07/15/1959: Lockheed UGM-27 Polaris AX launched, LC-25A, CCAFS (launch failure)
- 07/21/1959: GD Atlas SM-65C launched, LC-12, CCAFS
- 07/29/1959: GD Atlas SM-65D launched, LC-11, CCAFS

Events in August (10 to 60 years ago)

- **08/18/2009: LM GPS IIR-21/M8 launched by ULA Delta II 7925-9.5 from SLC-17A, CCAFS; final GPS IIR launch, final launch from SLC-17A**
- 08/29/2009: STS-128 (Discovery) launched, LC-39A, KSC; ISS mission
- 08/02/1999: LM THAAD interceptor launched, White Sands, New Mexico
- 08/08/1999: STS-28 (Columbia) launched, LC-39B, KSC (classified satellites)
- **08/25/1989: Voyager I flyby of Neptune (Voyager I launched by MM Titan IIIIE/GD Centaur in August, 1977)**
- 08/12/1969: ATS-5 launched by GD Atlas SLV-3C Centaur-D, LC-36A, CCAFS
- 08/23/1969: Classified launch by MM Titan IIIB, SLC-4W, VAFB
- 08/06/1959: Lockheed UGM-27 Polaris AX launched, LC-25, CCAFS (failed)
- 08/11/1959: GD Atlas SM-65D launched, LC-13, CCAFS
- 08/13/1959: Classified launch by Thor DM-18 Lockheed Agena-A, LC-75-3-4, VAFB
- 08/14/1959: Martin Titan I HGM-25A launched, LC-19, CCAFS (failed)
- 08/14/1959: Lockheed UGM-27 Polaris AX launched, LC-25B, CCAFS
- 08/19/1959: Classified launch by Thor DM-18 Lockheed Agena-A, LC-75-3-5, VAFB
- 08/24/1959: GD Atlas SM-65C launched, LC-12, CCAFS
- 08/25/1959: Lockheed UGM-27 Polaris AX launched, LC-25A, CCAFS (failed)

Events in September (10 to 60 years ago)

- 09/02/2009: LM Press Release Lockheed Martin's Orion Program is "Go for CDR"
- 09/03/2009: LM UGM-133 Trident II D5 launched, Eastern Range
- 09/04/2009: LM UGM-133 Trident II D5 launched, Eastern Range
- 09/08/2009: Classified launch, ULA Atlas V 401, SLC-41, CCAFS
- 09/17/2009: LM Press Release: New Missile Warning Satellite built by Lockheed Martin begins major environmental test phase [SBIRS]

- **09/24/2009: LM Press Release: Lockheed-Martin Built IKONOS Satellite marks 10 years in operations**
- 09/25/2009: USA-208/209 launched by ULA Delta II 7920-10C, SLC-17B, CCAFS
- 09/23/1999: Echostar 5 launched by GD Atlas IIAS, SLC-36, CCAFS
- **09/23/1999: Mars Climate Orbiter (MCO) is lost at Mars orbit insertion**
- **09/24/1999: LM IKONOS-2 launched by LM Athena II, SLC-6, VAFB (last Athena II launch)**
- **09/04/1989: DSCS-II/III launched by MM Titan 34D/Transtage, LC-40, CCAFS (final flight of Titan 34D and Transtage)**
- 09/06/1989: Classified launch by MM Titan II 23G, SLC-4W, VAFB
- **09/25/1989: FLTSATCOM-8 launched by GD Atlas G, LC-36B, CCAFS (last Atlas G)**
- 09/20/1979: HEAO-3 launched by GD Atlas SLV-3D, LC-36B, CCAFS
- 09/22/1969: Classified launch by Thorad-SLV-25-Lockheed Agena-D, SLC-3W, VAFB
- 09/30/1969: Classified/Technology Demonstration launch by Thorad-SLV-2G-Lockheed Agena-D, SLC-3W, VAFB
- 09/09/1959: Big Joe 1 (Boiler-plate Mercury capsule) launched by GD Atlas SM-65D, LC-14, CCAFS (partial failure)
- 09/09/1959: GD Atlas SM-65D launched, LC-576A-2, VAFB
- 09/17/1959: GD Atlas SM-65D launched, LC-13, CCAFS (failure)
- 09/21/1959: Lockheed UGM-27 Polaris A1 launched, LC-29A, CCAFS
- 09/28/1959: Lockheed UGM-27-Polaris AX launched, LC-25A, CCAFS (failure)

Reference websites:

<https://nssdc.gsfc.nasa.gov/planetary/chronology.html#2014>

https://en.wikipedia.org/wiki/Timeline_of_spaceflight

<https://www.ulalaunch.com/missions>

<https://news.lockheedmartin.com/news-releases?year=2019>

<https://space.skyrocket.de>

<http://www.astronautix.com>

History on the Road

Check back in the next MARS STAR for road trip stories and pictures from the Apollopalooza events at Wings Over the Rockies!

Barb Sande, MARS STAR and MARS Facebook Page Historian. Contact me at barbsande@comcast.net or 303-887-8511 or find MARS Associates on Facebook.

MARS Car Club News

By Roger Rieger
(rrieger10731@gmail.com)
303-912-6217

On a picture-perfect Colorado day, the MARS Car Club held its Second Annual Car Show in conjunction with the MARS picnic. There were 16 beautiful cars owned by fellow MARS members on display and all picnic attendees were invited to walk through the car show area and vote for their favorite "Peoples Choice" car.



Karen and Bob Paulson - Peoples Choice

Rob Madsen garnered the prestigious Judges Award.



Rob Madsen - Judges Award

Show members were asked for a \$10 registration fee, all proceeds of which will be donated by MARS Associates to the "Toys for Tots" program.

The Club invites all car enthusiasts to become members, meet other like-minded people, and enjoy and share our love for the automobile.

Bridge Club

By Dave & Kathy Martz
(martz20@comcast.net)

*"One advantage of bad bidding is that you get practice at playing atrocious contracts."
Alfred Sheinwold*

Come join us for our monthly game of bridge! All MARS members and their guests are welcome. We play on the **3rd Friday of each month at the Buck Community Recreation Center (Littleton) from 10 AM to 2 PM.** You'll need to pack a lunch, as we stop midway to eat. The club provides the cards and all required items for the games. We also provide coffee, tea, and hot water. There is a small fee to the Buck Center, as well as a small fee to the club (which helps with supplies and the year-end party in December).

We have couples, as well as singles, playing. If you're a single, invite a friend to be your partner, as your partner does not need to be a member of MARS to play.

If you have any questions, please contact any of the following Bridge Club Officers:

Presidents:

Dave & Kathy Martz, 303-683-9524

Vice-President:

Bill Kacena, 303-973-2685

Secretary:

Theodore Bornhoeft, 303-933-9730

The 2nd Quarter 2019 winners are as follows:

July 19 (4 tables)

- 1st - Theodore Bornhoeft & Jerry Baab
- 2nd - Dave & Kathy Martz
- 3rd - Loman & Pat Park
- 4th - Bart & Diane Wright

August 16 (3 ½ tables)

- 1st - Ernie & Cecile Berliner
- 2nd - Bill Kacena & Trudy Wright
- 3rd - Bart & Diane Wright
- 4th - Ed & Laurie Bock

September 20 (5 tables)

- 1st - Ernie & Cecile Berliner
 - 2nd - Dave & Kathy Martz
 - 3rd - Bart & Diane Wright
 - 4th - Curt & Phyllis Brudos
-
-

Dinner Club

By Becky and Gary Englebright
(englebright@earthlink.net)
303-941-3167 (Gary)
303-263-6457 (Becky), and
Anita and Roy Kannady
(anitakannady@yahoo.com)
303-794-9210

The dining schedule is set for the rest of year and for the first quarter of the new year. We are doing old favorites and some relatively new restaurants that have been popular. In September, we had a great time at Mt. Vernon, even with a small number of people attending. The food was good; the view spectacular! In October, the guests at Red Lobster were treated to a great meal and friendly service. We are finishing the year up with an Italian delight at Angelo's Taverna in November.

If you are wondering what the new year will bring, we are starting with the ever-popular show for lunch at Benihana in January. In February, we will celebrate President's Day with steak at Outback Steakhouse and in March we will celebrate St. Patrick's Day with Chinese at Imperial Chinese.

If you have friends who have been retired for a while, have recently retired or are thinking of retiring, bring them along. Please remember, venues have attendance limits, so you should make your reservations sooner rather than later if you wish to attend.

The restaurants scheduled for the rest of 2019 and the first quarter of 2020 are as follows:

- November 12th – Angelo's Taverna (Littleton)
- January 14th – Benihana (Denver)
- February 18th – Outback Steakhouse (Littleton)
- March 17th – Imperial Chinese (Denver)

When you receive the STAR, the flyers are now located within the document. We know some people have had problems finding the flyers for the last few months. The MARS flyers are located after the articles and the editors are also including where the flyers can be found on the front of the STAR. This should make it much easier for everyone to find the flyers. If you don't have a copy of the STAR, you can always go to the MARS website and click to the Dinner Club selection to find copies of the flyers. If all else fails, give Becky or Gary a call and we can get you the information (303-263-6457 or 303-941-3167).

Check the calendar on the back of the STAR for additional luncheon dates that are scheduled. We continue to explore the restaurant scene looking for new and interesting places to have lunch. If you have a

suggestion for a new venue, please let us know. (If you call and we aren't home, please leave a message.)

We have scheduled restaurants each month with the goal of keeping our costs in check, recognizing that increases are likely. In addition, we will continue to strive to provide luncheon opportunities that are on the lower end of the scale to help balance the cost. Remember, the luncheon prices always include the tax and tip.

"The only time to eat diet food is while you're waiting for the steak to cook."
Chef Julia Child

Golf League

By Bo Rodriguez
(boandpat@comcast.net)

Another favorable MARS golf season is nearing its conclusion at the end of October. It is amazing how quickly the time has passed since our golf kickoff meeting on April 4th. This year we played our weekly golfing outings at Broken Tee in Englewood with the exception of our September 12th event at Homestead Golf Course. We had three early season weather cancellations and a couple of warm weather days in August but all things considered the season has been enjoyable.

We concluded our two-day league championship tournament on August 22nd at Broken Tee. The combined net score of the two rounds determined the overall winners as:

- 1st place – Bo Rodriguez net score 132
- 2nd place – Matt Grogan net score 133*
- 3rd place – Jim Fairchild net score 133
- 4th place – Bob Knickerbocker net score 134*
- 5th place – Terry Graber net score 134
- 6th place – Kathy Rieger net score 135
- *2nd day score tie breaker

Closest to the pin:

- Aug 15th hole #5 – Layne Weber; hole #10 – Don Petermann
- Aug 22nd hole #5 -- Kathy Rieger; hole #10 – Larry Moore

Medalist Winner – Terry Graber with the lowest gross score 160

I want to give my thanks and appreciation to several of our members who volunteered their time to make this season a success. Bill Fulkerson served as our Vice-

President and took on some major tasks and will serve as our president next season. Bob Bowe, Terry Graber and Jim Libhart did an outstanding job as golf event schedulers by pairing players with tee times and getting the lists sent out each week; Tom Ripper ensured that our correct scores were posted each week so that we would have correct handicaps, and Tom Cooke kept our financial records accurate and current. A special thanks to Bob Knickerbocker for posting our weekly league results on the MARS website as well as keeping us informed on rules, bylaws and other points of interest affecting our league. To all of our golf members that served as co-chairs for each tournament event, thank you for finalizing the tee times each week and collecting the event results to determine the flight winners and prize money allocation.

My hat is off to a handful of active golf league members that have endured in our league for approximately 20 years. They include: Don Williams, Gene Sobke, Ev Palmer, Tom Cooke, Matt Grogan, John Laritz and Curt Brudos. Don says he believes he joined the MARS golf league in 1990. At that time, as he can recall, they played at Raccoon Creek and had approximately 120 members. They played on a rotating bi-weekly basis dependent on the number of foursomes allotted to the league by the golf course.

For those MARS Associate members interested in joining our golf league, please check out our MARS website: <http://www.marsretirees.org> and click on "Golf" in the clubs listing section.



Hiking Club

By Sue Janssen
(susan.g.janssen@gmail.com)

Club members enjoyed two hikes in Colorado this late summer. Many members were globe-trotting (Norway, Peru, Italy, etc) and I am looking forward to hearing about their adventures!

Gene Dionne loves the high places! In preparation for his trek in the Dolomites, Gene organized a climb of a 14'er on 28 August. Torreys Peak is accessed by a rough 4-wheel-drive-only road, off of I-70 at the Bakerville exit just east of Eisenhower Tunnel. It was a small turnout with just Gene, Sue and Lee Janssen but it proved to be an ideal weather day in the high mountains

(with no clouds in sight!) while metro Denver baked in ~95 degree heat. The climb was fairly uneventful except that Lee decided to climb via the technical Kelso Ridge route (with Class 3/4 moves and substantial exposure) leaving Sue and Gene to take the normal Class 2 route. In the MARS Hiking Club, Lee is in a class by himself for his speed and daring, and the same was true on Torreys that morning as he summited well before Sue and Gene could get there and they ended up meeting at the saddle between Grays and Torreys Peaks for lunch at 11:00. The return down the trail offered great views of the valley and many rugged peaks. If you are not up to climbing a 14'er yourself, you can enjoy "armchair travel" through www.14ers.com.



Post-lunch group photo at the saddle with Torreys Peak in the background.



Lee Janssen on Kelso Ridge (Selfie)

In September, eight hikers enjoyed a fall-like morning (crisp air and beautiful clouds) while tromping for about six miles at Centennial Cone Open Space in Clear Creek Canyon. We parked at the west trailhead to avoid the climb up Mayhem Gulch then walked through golden grassy meadows and healthy Ponderosa Pine forest, past a dilapidated farm to the north trailhead. The return was fast as we looked forward to lunch and drinks at El Dorado Mexican restaurant in Golden.



MMMM! Smells like butterscotch! Pictured: Jeff Schnackel, Vicky Eberhard, Robin Zen, Mark Nash, Lee Janssen, Val Gregory. Hugging the other side of the tree is Sue McKaig. (Photo by Sue Janssen)

One of the "10 essentials" for hiking is "illumination." Generally, we plan to hike during the day, but sometimes we start out before sunrise, or the hike runs late in the day. So pack a small headlamp or flashlight "just in case." LED light sources are inexpensive, bright and lightweight.

We'll be hiking in the fall to enjoy some special places and then we will dig out our snowshoes to prepare for winter outings. If you wish to join the MARS Hiking Club, contact Sue Janssen at susan.g.janssen@gmail.com who will add you to the club distribution list. Please provide your email address, home phone and cell phone for the roster. The schedule of hikes is posted on the MARS website (<http://www.marsretirees.org/>). Even if you have never gone snowshoeing or hiking you are welcome to join in the fun.

Happy trails!

The MARS Associates Website

By Jim Kummer
jkummer@comcast.net

Be sure to use caution when surfing the web, so your computer doesn't get infected with ransomware, malware, or viruses. When visiting a webpage, look for telltale signs that it might not be the one you intended.

Look for poor grammar, misspelled words, or misspelled web address (URL). Be wary of emails purporting to be from your bank, broker, or the IRS. Check the email address of the sender, and the URL of any attachments before clicking on anything. When you open an email, you will see the sender's alias and detailed address, such as **Sears Home Services** <nobusiness@suckersales.com>. Pay close attention to the real address. Finally, be sure your operating system and virus detection software are all up to date.

You'll find no malware on the MARS website, www.marsretirees.org, only excellent information resources for MARS members. Here are the websites of the month from the last quarter:

July – Thought provoking tidbits at
bigthink.com/

Aug – Hidden Uses for Everyday Items at
shareably.net/hidden-uses-everyday-items

Sept – View stimulating, entertaining talks
 at ted.com

Your website committee members welcome your suggestions for improvement, and for proposed websites of the month. Email them to me at jkummer@comcast.net. Your website committee members are: Al Butvidas, Bob Knickerbocker, Linda Stearns, Duane "Smitty" Smetana, and Jim Kummer (Webmaster).

Photography Club



Photography Club Background

The MARS Photography Club meets at the *Littleton Bemis Library*, located at 6014 S. Datura Street, in Littleton, CO, from 1:00 PM to 3:30 PM, in the downstairs meeting room. We normally meet the second Thursday of the month. Each meeting includes a presentation and a friendly print competition. Selected competition winners appear on the *MARS Retirees Website* in the *Photography Club* section.

Meeting Presentations

Please note that we do not meet in June, July, or August for summer vacation. Our last meeting this quarter was on September 12, 2019. Jim Kummer made a

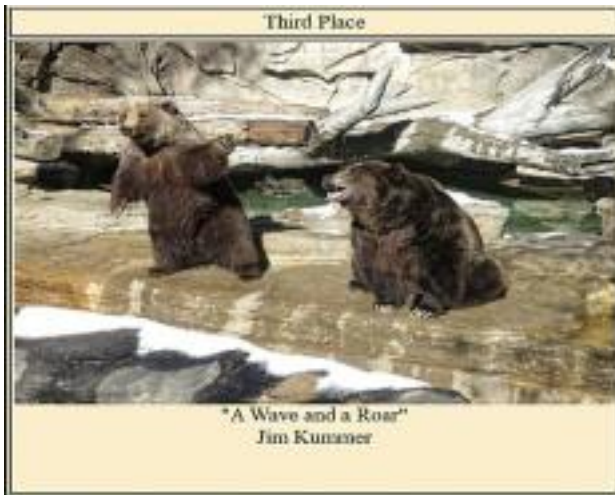
presentation on several useful photograph digital programs and Fred Luhman was our competition judge. John Chapter was on vacation trip with *The Archaeological Conservancy* to see many sites in Arizona, as well as Mesa Verde in Colorado; hopefully we will have a presentation in the coming year.

Jim made an attractive poster, shown below, promoting our photo-club at this year's retirees' picnic in September 2019. We hope that this might help increase our club's membership.

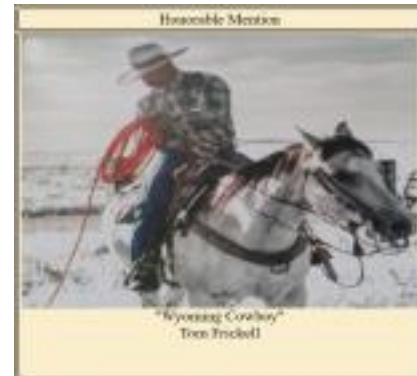


Please check out all of Septembers 2019 winners on the **MARS Retirees web site**.

Two images that I appreciated were by Jim Kummer and Tom Frickell that are shown below:



Jim's image tells a story and I like the red-colored-rope that stands out in Tom's image.



Please go to the *Mars Retirees* website (www.marsretirees.org, under Photography Club) to check for a summary of our upcoming programs.

Joining Our Club

You can become a member of the *MARS Photography Club* by just stopping by one of our meetings and we would love to have you be a part of our club. Share your great vacation trip images, membership is fun, and the only requirement is that you are a MARS Associates member. We currently have about twenty active club members.

If you have any questions or comments, please contact John Chapter, our club President.

Colorado Springs Lockheed Martin Retiree Group News

By Doug Tomerlin
(dougincs@aol.com)

Our retiree group did not host any functions this summer. We typically hold a spring and a fall luncheon. Our fall luncheon has not yet been scheduled, but most likely will be held late October or early November with the location yet to be determined.

Our retiree group is composed of retirees from:

- Lockheed Martin divisions in Colorado Springs
- Heritage companies: Philco, Philco-Ford, Ford Aerospace, and Loral in Colorado Springs
- Any Lockheed Martin division or a heritage company

Retirees are welcome to join if you have retired or are retiring from Lockheed Martin or one of the heritage companies. There is no cost to join the group.

We welcome the following retiree who joined the Colorado Springs Lockheed Martin Retiree Group since the last newsletter:

- Don McCleary

We are all deeply saddened by the passing away of fellow retirees:

- Holly Meyer
- Larry Lewellyn

If you would like more information about the Colorado Springs Lockheed Martin Retiree Group or luncheons, please contact Doug Tomerlin at dougincs@aol.com .

Lockheed Martin Space Health Screening Fair

By Judy Nielsen
(nielsen_129@q.com)

On September 19, 2019, MARS volunteers and Board Members, Sherry Vargo and Bill Wise, set up and manned a MARS information table at the recent LM Space Health Screening Fair. They were reaching out to prospective retirees to encourage membership in our MARS organization.

Additionally, Karen Paulson, Larry Major, Linda Duby and Judy Nielsen assisted with setting up and manning the registration table and other areas, as well as provided some assistance for various screenings (i.e., hearing, blood, BMI, cardiac, etc.).

The event was a huge success and the Fitness Center folks have received many compliments for the quality of care our MARS volunteers provided to the employees.

Stay tuned for volunteer opportunities in 2020 including the next Health Screening Fair! Volunteering is a great way to stay in touch, keep active, and provides a chance to reconnect with familiar faces and make new friends.

Cape Canaveral News

By Dick Olson
(Olsons5145@aol.com)

Luncheons

July -- Had a pretty good turnout with some folks we haven't seen for a while. Regulars: Wendell McDaniels, Ken Hawes, Abe Smith, Bill Masteson, Larry Gleason, Roger Wright, Ken Webb, Jimmy Weddle, Jerry Moskowitz, Frank Indihar, Danny Molina, and Don Anderson. People we haven't seen lately were Lynn Johnson, Cecil Snipes, Rich Tennis and his friend, and Dave Kintigh who has recovered from his heart problems. Some we haven't seen for a real long time

were Bob Day and Sylvia and John Sansang. Glad they were able to make it and hope they make a habit of it.

Heard from Ben Duesenberry and he plans to be here in November for the Old Car BBQ and Thursday meetings at Kay's and Beef O'Bradys. He would like to discuss having a 15th anniversary of the last Titan launch next April and to sign up volunteers to help so please plan on attending at least one of the events.

Hope everyone had a good 4th of July and have good summer.

August -- Kind of a light turnout this month. Regulars making the scene were: Wendell McDaniels, Dave Kintigh, Abe Smith, Frank Indihar, Jerry Moskowitz, Jimmie Weddle, Larry Gleason, Walt Starkey, Tom Savage, Danny Molina and Don Anderson.

Heard from Wes Hutchison and he reports he only has 1 chemo treatment and 8 radiation treatments to go. We all wish him well.

Tom Savage was talking about the Titan display at Wright Patterson and we kicked around taking a day trip up there. Could fly out of Sanford to Dayton, visit the museum, and fly back that evening. It would be fun to get a group together and go.

September -- No meeting due to threat of Dorian.

Recent Obituaries

Lamont James Balongue, 75, passed away on August 22, 2019. He served a distinguished 23 years in the United States Army and retired as a Chief Warrant Officer III. His military career was followed by an equally distinguished career with Lockheed Martin.

Harold L. Hahn, Hal, passed away on August 26, 2019. Hal was the RL10 engine guy throughout his career at General Dynamics -- And in fact he bought a salvaged RL10 Engine and donated it to the San Diego Air & Space Museum (SDASM).

Martin Marietta Retiree's Club (Vandenberg News)

By Charlie Radaz
(fcjradaz@aol.com)

Our group met at the Mission Club (formerly Village CC) on 25 July and had Lt Col Joe Bassi as the speaker; he is an official NASA Ambassador. His talk centered on NASA plans and exploration. There were 23 attendees.

On the 29th of August, our group met back at Rooney's Pub in Orcutt, now converted to A BLAST PIZZA. We had 22 attendees. No speaker. We are planning on meeting here again on 26 September.

We normally meet the last Thursday of each month at noon. All former employees, their spouses and associate contractors are welcome to attend, visit and share informal stories. Please call Eunice Souder (805) 218-7605 for meeting location and reservations.

Lockheed Martin (LM) News

LM Completes NASA's Orion Spacecraft Capsule for Artemis 1 Mission to the Moon

The goal of humans again walking on the Moon is one giant leap closer. Lockheed Martin (NYSE: LMT) has completed building the capsule for NASA's [Orion spacecraft](#). The crew module capsule for the uncrewed [Artemis 1](#) mission to the Moon has been stacked on top of the Orion service module, which was also recently finished.

Vice President Mike Pence made the announcement today at a ceremony in front of the Orion spacecraft in the aptly-named Neil Armstrong Operations and Checkout Building at the [Kennedy Space Center](#) in Florida. The event and announcement commemorated the 50-year anniversary of the [Apollo 11](#) Moon landing.



On the anniversary of the Apollo Moon landing, the Lockheed Martin-built Orion capsule for the Artemis 1 is declared finished.

The Orion spacecraft is like none other in its design and capability.

"Orion is a new class of spaceship, uniquely designed for long-duration deep space flight, that will return astronauts to the Moon and eventually take the first humans to Mars, and bring them all back safely." said Lisa Callahan, vice president and general manager of Commercial Civil Space at Lockheed Martin. "Orion will accelerate scientific discovery of our solar system and will be the cornerstone of the defining space achievement of this era."

Since the crew module pressure vessel arrived in Florida, technicians and engineers from Lockheed Martin, NASA and supporting contractors have meticulously assembled the capsule into its finished state. The work included installing the capsule's avionic computers, harnesses, propulsion system and its 12 engines, 11 parachutes, its large 16-foot-diameter heat shield, forward bay cover and numerous other systems and components.

"Throughout assembly, the team tested and validated the many systems a hundred different ways to ensure they will operate as designed in the harshness of deep space," said Mike Hawes, Orion program manager for Lockheed Martin. "The Artemis 1 flight will test the design and workmanship of the capsule and its service module during the three-week mission out around the Moon and back. We're excited for this mission as it paves the way for the first crewed mission in 2022, Artemis 2."

The crew module and service module were stacked together earlier in the week in the Final Assembly and System Testing (FAST) cell where they are now being fully integrated, including connecting the physical retention bolts and the umbilical lines between the two modules. The FAST cell is also where the Apollo spacecraft were integrated.

The combined stack will then be powered up and undergo a series of integrated systems tests. In September, the combined stack will be shipped to NASA's [Plum Brook Station](#) in Ohio, where it will go through environmental testing in a large thermal vacuum chamber as well as testing for electromagnetic interference and compatibility.

Once Orion returns to Kennedy at the end of the year, the spacecraft will go through final preparations before Lockheed Martin delivers it to ground systems for launch processing in early 2020.

More information about Orion: LM Orion page: <https://www.lockheedmartin.com/orion>

NASA Orion page: <https://www.nasa.gov/orion>

Second Lockheed Martin-Built Next Generation GPS III Satellite Responding to Commands, Under Self-Propulsion

The U.S. Air Force's second next-generation GPS III satellite, built by Lockheed Martin (NYSE: LMT), is responding to commands, under control and now using its own internal propulsion system to get to orbit following its successful launch this morning.

At about 11:01 a.m. ET, Air Force and Lockheed Martin engineers at Lockheed Martin's Launch & Checkout Facility near Denver declared they had full control of GPS III Space Vehicle 02 ([GPS III SV02](#)) shortly after the satellite's separation from its United Launch Alliance (ULA) Delta IV rocket booster. The satellite, nicknamed "Magellan" by the Air Force, began its rocket ride to space with a 9:06 a.m. ET launch from Cape Canaveral Air Force Station.

GPS III SV02 is now climbing towards its operational orbit about 12,550 miles above the earth under the power of its own Liquid Apogee engines. Engineers at Lockheed Martin Space's Waterton, Colorado facility are commanding the satellite using elements of the GPS Next Generation Operational Control System (OCX) Block 0.

"GPS III SV02 is receiving and responding to commands just as planned. In the days ahead, we'll finish orbit raising to our operational slot and then send the satellite commands telling it to deploy its solar arrays and antennas," said Johnathon Caldwell, Lockheed Martin Space's Vice President for Navigation Systems. "Once we are set up, we'll begin on-orbit checkout and tests, including extensive signals testing with our advanced navigation payload."

GPS III SV02 is the second GPS III satellite designed and built by Lockheed Martin to help the Air Force modernize today's Global Positioning System (GPS) constellation with new technology and capabilities. GPS III satellites provide 3x greater accuracy and up to 8x improved anti-jamming capabilities. GPS III also provides a new L1C civil signal, compatible with other international global navigation satellite systems, like Europe's Galileo.

Space Training, Simulation and Development Facility Opens in Colorado Springs

Pulsar Guardian is a new, state-of-the art facility built by Lockheed Martin (NYSE: LMT) in Colorado Springs that lets the Air Force and others simulate, test and train in a multi-domain environment that reflects today's complex space environment.

For the first time, warfighters can bring in any tool, from any company to simulate, test and train in a realistic synthetic space environment without disrupting real missions. Pulsar Guardian follows the U.S. Air Force Universal Command and Control Interface standard (UCI) and is fully compliant.

"Pulsar Guardian reflects a new way for space operators to evaluate new systems, changes to existing ones, or train on the platforms they use every day," said Maria Demaree, Lockheed Martin Space vice president and general manager of Mission Solutions. "Wargaming and training have never been as immersive – it's a game changer."

[Multi-Domain Operations](#) require new, agile spaces that the military can use to integrate, synchronize and simulate battle conditions without interrupting present-day operations. Pulsar Guardian can simulate what an Air-Space-Integration looks like by showing how an unmanned aircraft or fighter jet could interface directly with a satellite and get the right data at the right time to take action. [Cyber](#) attacks and mitigations can be tested in a sandboxed, collaborative environment.



Pulsar Center at Lockheed Martin Space in Littleton, Co.

Pulsar Guardian is a new class of collaborative space that links into a network of fully-immersive workspaces across Lockheed Martin Space. Pulsar facilities reduce travel time and costs for customers and Lockheed Martin employees through being able to quickly bring subject matter experts and engineers from around the globe into the conversation to quickly diagnose a problem, brainstorm a tough problem in real-time, or make changes to a product on the fly using Virtual and Augmented Reality.

United Launch Alliance News

Vulcan Centaur Rocket on Schedule for First Flight in 2021

Centennial, Colo., Aug. 12, 2019 – At the United Launch Alliance (ULA) factory in Decatur, Alabama, production of the first Vulcan Centaur rocket continues, with shipment to the launch site at Cape Canaveral Air Force Station in Florida scheduled for late next year for processing in preparation for its first launch in 2021.

“Atlas and Delta rockets have been the backbone of national security space launch for decades, building on a progressive history of technology development and advancement -- Vulcan Centaur will advance this rich heritage,” said Tory Bruno, ULA’s president and CEO. “Following the successful launch of our 134th mission just last week on our Atlas rocket, we submitted our purpose-built Vulcan Centaur rocket for the U.S. Air Force’s Phase 2 Launch Services competition. It is so exciting to see the first flight vehicle coming together at our factory.”

The Department of Defense has established a selection strategy to ensure a smooth transition to a U.S. engine, while introducing competition, driving down costs and safeguarding continued assured access to space by preventing any capability gaps. Nearly one year ago, the Air Force held a competition and awarded three Launch Services Agreements for public-private partnerships to develop launch vehicles. Phase 2 is the next procurement in the Air Force’s strategy.

“The nation is facing a contested space environment, and we are unleashing the energy of American ingenuity by developing Vulcan Centaur to meet our nation’s need for expanding space missions,” said Bruno. “Vulcan Centaur’s flight proven design, coupled with innovative technology, is transforming the future of space launch and will advance America’s superiority in space.”

ULA is the nation’s only full-range national security space launch provider and is the most experienced, with more than 130 launches and 100 percent mission success. Additionally, ULA and the heritage companies are the nation’s only firms who have ever flown the exquisite Category C heavy-class national security missions, thus providing the country with extreme confidence of continued low-risk mission performance.

“Vulcan Centaur will provide higher performance and greater affordability while continuing to deliver our unmatched reliability and orbital accuracy precision from

our treasured cryogenic Centaur upper stage,” said Bruno. “ULA is the best partner for national security space launch, and we are the only provider to demonstrate experience flying to all orbits including the most challenging heavy-class missions, providing the bedrock foundation for the lowest risk portfolio of two launch service providers for the U.S. Air Force.”

In the factory, the fabrication of the structure for the first Vulcan Centaur rocket continues, and the team recently completed the booster structural test article in Decatur. In Florida, assembly of the new Mobile Launch Platform has begun in preparation for the first launch.

United Launch Alliance Successfully Launches GPS III Satellite

Cape Canaveral Air Force Station, Fla., (Aug. 22, 2019) – A United Launch Alliance (ULA) Delta IV rocket carrying the second Global Positioning System III (GPS III) satellite, designated Magellan, for the U.S. Air Force Space and Missile Systems Center lifted off from Space Launch Complex-37 on August 22 at 9:06 EDT. This mission marked the 29th and final flight of the Delta IV Medium rocket and the 73rd GPS launch by a ULA or heritage vehicle.

The GPS III system, built by Lockheed Martin, represents the next step in modernization of the worldwide navigation network with a new generation of advanced satellites offering improved accuracy, better anti-jam resiliency and a new signal for civil users.

This mission launched aboard a Delta IV Medium+ (4,2) configuration vehicle, which included a 4-meter Payload Fairing and two Northrop Grumman solid rocket motors. The common booster core for Delta IV was powered by the RS-68A engine, and the Delta Cryogenic Second Stage was powered by the RL10B-2 engine, both supplied by Aerojet Rocketdyne.

ULA’s next launch is Boeing’s CST-100 Starliner, Orbital Flight Test, aboard an Atlas V rocket from Space Launch Complex-41 at Cape Canaveral Air Force Station, Fla.





MARS Associates

2019 Holiday Celebration Luncheon

The Officers and Directors of MARS Associates invite you to join the 2019 Holiday Celebration on **WEDNESDAY, December 4, 2019, at The Pinehurst Country Club** (map on reverse). This year we are offering you the choice of a Roasted Strip Loin of Beef with Peppercorn Brandy sauce, Herb Grilled Salmon with Lemon Butter Sauce, or Chicken Marsala. Each luncheon will include a mixed green salad, vegetable medley, roasted new potatoes, rolls and butter, beverages, and a dessert. Please specify your choice of entrees on the reservation form below. If you have special dietary needs, contact Linda Duby with the details. Lunch will be served at 12:00 noon.

The cash bar will be open at 11:00 a.m. Please note that the bar is CASH ONLY since Pinehurst is unable to accept credit cards.

The prices for the meals are as follows:

	Member/Spouse/Companion Price	Non-MARS guest price
Roasted Loin of Beef	\$25.00	\$43.00
Grilled Salmon	\$25.00	\$43.00
Chicken Marsala	\$20.00	\$43.00

These prices include taxes and gratuities. Please complete the form at the bottom of this sheet, detach it along the dotted line, and mail it with your check (made payable to **MARS Associates**) to the address below:

MARS Associates, PO Box 1128, Littleton, CO 80160-1128

Reservations must be received by **November 26, 2019**.

If you wish to make a monetary donation for **Toys for Tots**, or to donate an *unwrapped* toy, we will be collecting them at the check-in table.

If you make a reservation and later find you cannot attend, please notify Larry Stearns at 303-797-3557 or mars-larry-treas@comcast.net or Linda Duby at 303-249-1665 or lindaduby@comcast.net or Carl Kaminski at 303-726-1546 or carlcolo@centurylink.net no later than **November 26, 2019** to receive a refund. Admission is by reservation only.

----- DETACH HERE -----

Holiday Celebration - December 4, 2019. Please print clearly.

Mail to: **MARS Associates, PO Box 1128, Littleton, CO 80160-1128**

Member: _____	Beef _____	Salmon _____	Chicken _____
	\$25.00	\$25.00	\$20.00
One Spouse/Companion/Guest: _____	Beef _____	Salmon _____	Chicken _____
	\$25.00	\$25.00	\$20.00
Other Guests: _____	Beef _____	Salmon _____	Chicken _____
	\$43.00	\$43.00	\$43.00

(Add sheet for additional guest names) Member Phone No. _____

Member e-mail address _____

Member/Spouse/Companion/Guest ___ @ \$25.00 = \$ _____ Other guests @ \$43.00 = \$ _____

Member/Spouse/Companion/Guest ___ @ \$20.00 = \$ _____

TOTAL ENCLOSED \$ _____ Check # _____

PINEHURST COUNTRY CLUB, 6255 W. Quincy Avenue, Denver



Lunch on Tuesday, January 14th, 2020

Join your fellow MARS Associates for a wonderful lunch at



Benihana

3295 S. Tamarac Dr., Denver, CO 80231
(see map on back)
303-750-0200



Lunch will be served at Noon.

Featuring soup or salad, choice of entrée, Hibachi rice and vegetables, ice cream and iced or hot green tea. Cash bar for other beverages will be available. (Tax and gratuity included.)

Seating is LIMITED to 60
\$25/person

If we have reached the seating limit prior to receiving your reservation, we will contact you about putting you on a waiting list.

Please complete the form shown below and mail it, along with your check, payable to **MARS Associates Dinner Club** by **January 6th, 2020** to

Becky and Gary Englebright
7855 S. Vance Ct.
Littleton, CO 80128
303-941-3167 or 303-263-6457
englebright@earthlink.net

If you need to cancel, please let us know no later than January 6th to receive a refund.

Lunch at Benihana on Tuesday, January 14th, 2020

Name(s): _____ Number of Attendees: _____
Address: _____ Amount of Check: \$ _____
City/State/Zip: _____ Check Number: _____
Phone Number: _____ Date: _____
Email: _____

- Teriyaki Beef & Chicken
- Teriyaki Beef & Shrimp
- Teriyaki Beef & Scallops

- Chicken & Shrimp
- Chicken & Scallops
- Shrimp & Scallops

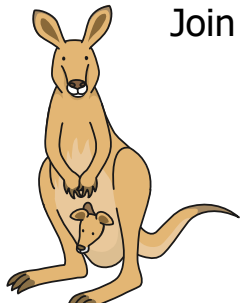
Map to Benihana



3295 S. Tamarac Dr., Denver, CO 80231
303-750-0200

North on S. Tamarac Dr. from E. Hampden Ave.
Restaurant is on the west side of Tamarac.

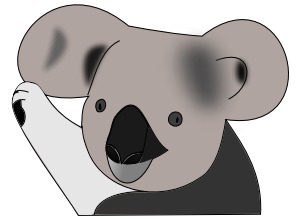
Lunch on Tuesday, February 18th, 2020



Join your fellow MARS Associates for a wonderful lunch at

Outback Steakhouse

8601 W. Cross Dr., Littleton, CO 80123
(see map on back)
303-932-0315



Lunch will be served at Noon.

Featuring a salad, choice of entrée with one side item, dessert and non-alcoholic beverages.
Cash bar will be available. (Tax and gratuity included.)

Seating is LIMITED to 60
\$25/person

If we have reached the seating limit prior to receiving your reservation, we will contact you about putting you on a waiting list.

Please complete the form shown below and mail it, along with your check, payable to **MARS Associates Dinner Club** by **February 10th, 2020** to

 **Becky and Gary Englebright**
7855 S. Vance Ct.
Littleton, CO 80128
303-941-3167 or 303-263-6457
englebright@earthlink.net 

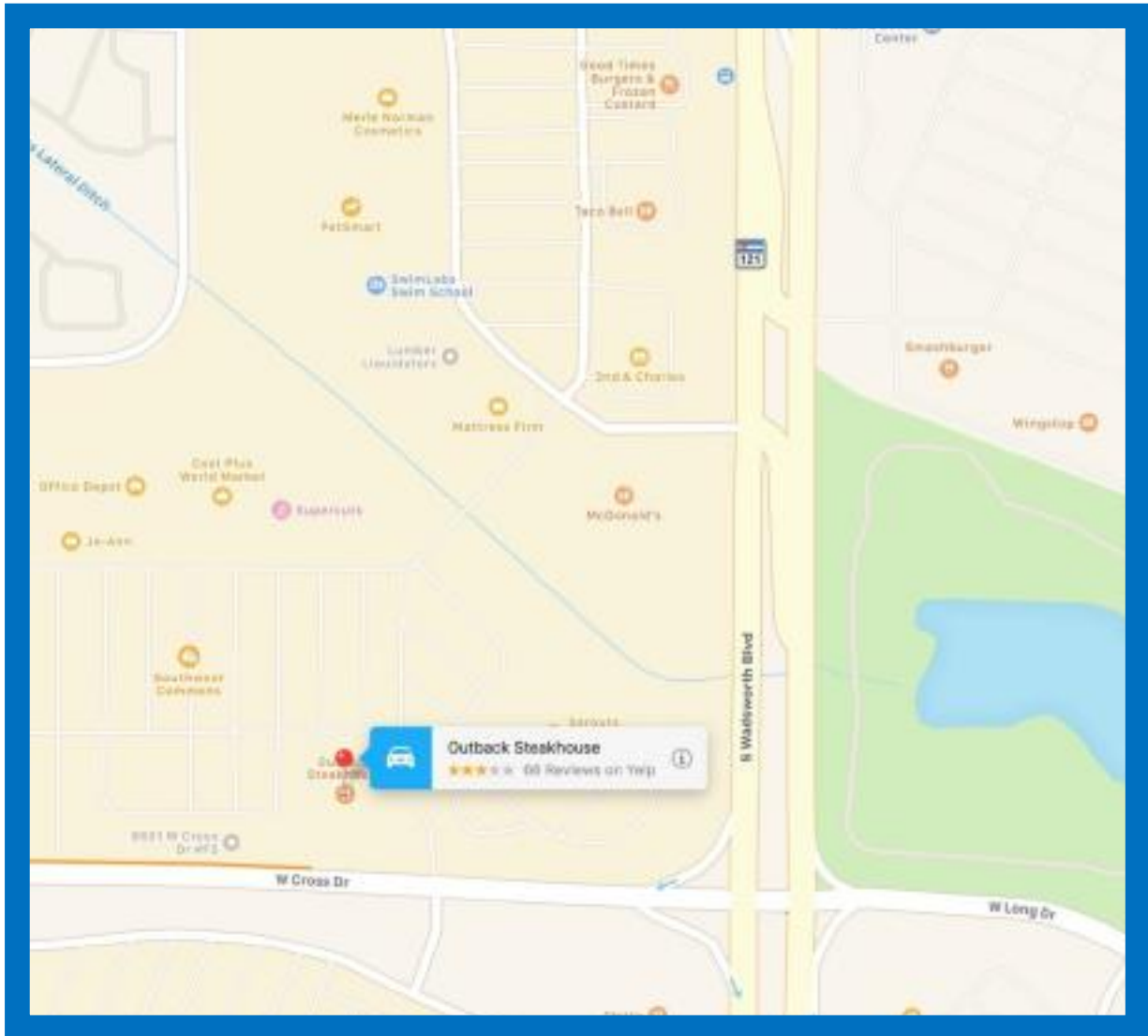
If you need to cancel, please let us know no later than February 10th to receive a refund.

Lunch at Outback Steakhouse on Tuesday, February 18th, 2020

Name(s): _____ Number of Attendees: _____
Address: _____ Amount of Check: \$ _____
City/State/Zip: _____ Check Number: _____
Phone Number: _____ Date: _____
Email: _____

- | | |
|---|--|
| <input type="checkbox"/> Sirloin & Shrimp (GF) | <input type="checkbox"/> Grilled Salmon (GF) |
| <input type="checkbox"/> Chicken on the Barbie (GF) | <input type="checkbox"/> ½ Rack Baby Back Ribs |
| <input type="checkbox"/> Chicken & Shrimp Pasta | |

Map to Outback Steakhouse



8601 W. Cross Dr., Littleton, CO 80123
303-932-0315

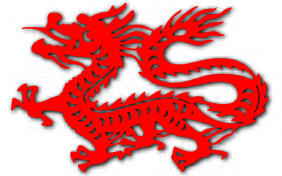
Take Wadsworth to W. Cross Dr. turn west. Restaurant is on the north side of W. Cross Dr.

Lunch on Tuesday, March 17th, 2020

Join your fellow MARS Associates for a wonderful lunch at



Imperial Chinese



431 S. Broadway, Denver, CO 80209
(see map on back)
303-698-2800

Lunch will be served at Noon.

Featuring a delicious family style lunch of wonderful Chinese delicacies including a gluten-free option, ice cream and hot tea. Cash bar for all other beverages will be available. (Tax and gratuity included.)

**Seating is LIMITED to 70
\$25/person**

If we have reached the seating limit prior to receiving your reservation, we will contact you about putting you on a waiting list.

Please complete the form shown below and mail it, along with your check, payable to **MARS Associates Dinner Club** by **March 9th, 2020** to

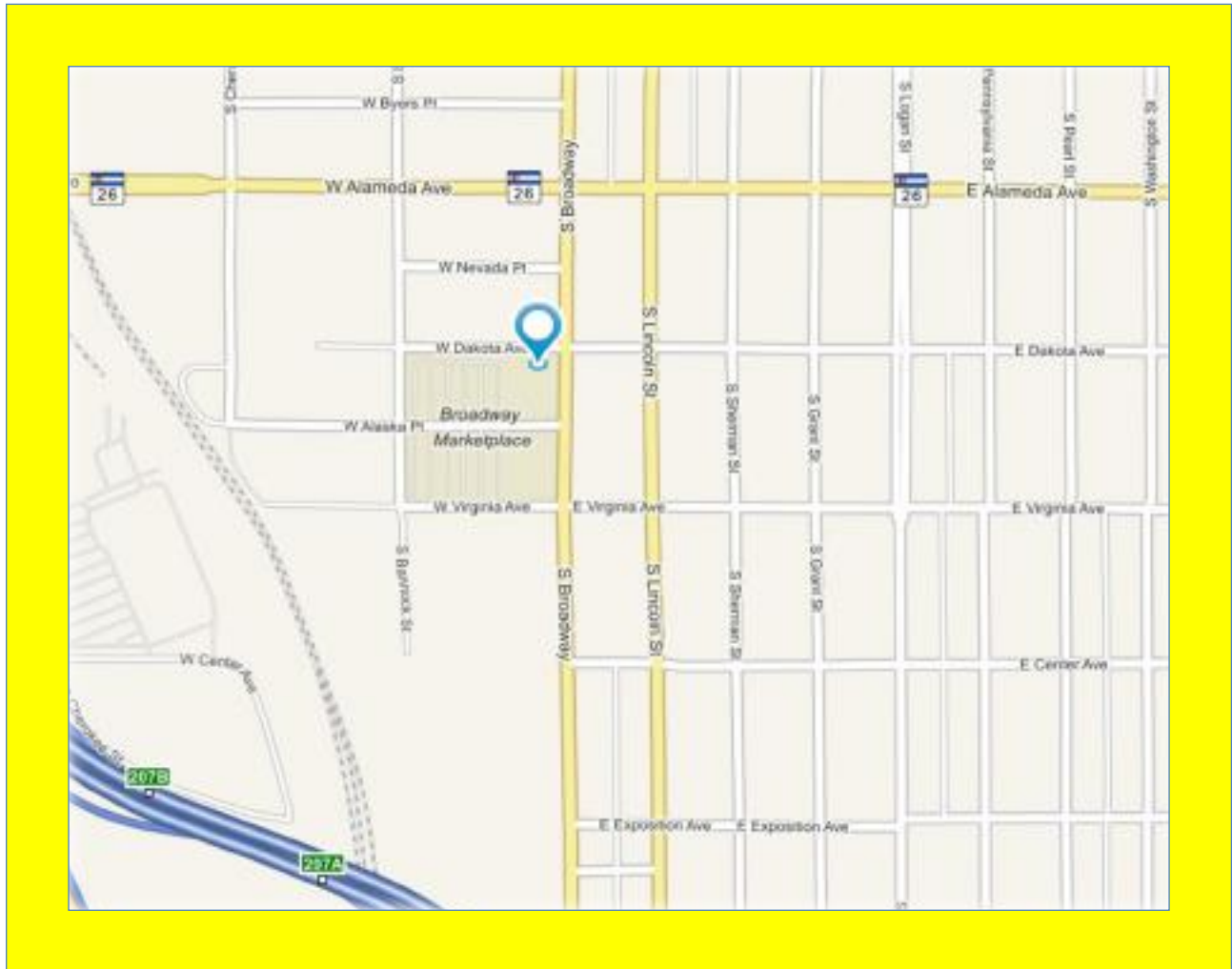
 **Becky and Gary Englebright**
7855 S. Vance Ct.
Littleton, CO 80128
303-941-3167 or 303-263-6457
englebright@earthlink.net 

If you need to cancel, please let us know no later than March 9th to receive a refund.

Lunch at Imperial Chinese on Tuesday, March 17th, 2020

Name(s): _____ **Number of Attendees:** _____
Address: _____ **Amount of Check:** \$ _____
City/State/Zip: _____ **Check Number:** _____
Phone Number: _____ **Date:** _____
Email: _____

Map to Imperial Chinese



431 S. Broadway, Denver, CO 80209
303-698-2800

Imperial is located at the northwest corner of W. Dakota Ave. and S. Broadway



Al Nemes and Rex Guthrie



MARS Associates at the Game



Antonio Trujillo and Dick Sosnay



Janize Redfield Won the Free Tickets



Barb and Steve Sande



Bob and Karen Paulson



Ellen and Pat Albert



Bud Stodghill and Larry Campbell



Fesja Hatrh and R1 Jensen



Dave and Kathy Martz



Gerry Barck and Barb Ward



Glenda and Charlie Haupt



Jo and Bob Wessels



Jack Thompson and Carolyn Malaby



Julie Tarpley



Janice and Thomas Redfield



Katie Davis, Phil Davis, Mollie Christensen, Darcy Barrows



Lenette Wallace, Greg Bowman, Cal Bowman



Sandy Thimmig - Moon Luckow



Mike Carroll - Sherry Vargo



Larry and Mary Moore



Matt and Livie Grogan, Donald Linden and Jeanne Dowe



Van Vandeventer - Larry Jones

*Car Club Second Annual Car Show
September 11, 2019*



Al Nemes



Carol Lovelace



Bill Wise



Eric and Cindy Georges



Bo Rodriguez



Don Schade



Jim Miles



Judy and Leroy Nielsen



Jo and Bob Wessels



Kathy and Roger Rieger



John Smith



Rhonda and Dave Ernst

See More Car Club Pictures at
www.marsretirees.org



Check-in Tent



2019 Picnic Group



2019 Picnic Group2

MARS Associates Picnic Prize Winners!!



Rob Madsen



Bob Paulson



Jeanne Dowe



Barb Espinoza



Verda Mead



Bev Baugher



Glenn Glass



Duane Del Duca



Richard Hurley



Dave Ernst



JoAnn Adolf



Moon Luckow



Gerald Sinn



Mary Groat



Jo Green



Glenda Haupt



Jill Demchak



Corey Kroll



Maxine Meunier

**Congratulations
to
ALL**



Carol and Ralph Dergance



Larry Campbell and Bud Stodghill



Deanne Dahl and Barb Espinoza



Linda Berry, Lonnie Jones, Mavis Kacena



Jack Rombach and Gerald Sinn



Marj Wise and Carolyn Kimpton



Vendor Booth for "Perfect Time Tours"

That's All Folks

Schedule Addendum (See last page)

1. BOD meets 1st Wednesday of every other month at The Egg & I, Highlands Ranch at 09:30 am.
 2. Officers meet 1st Wednesday of every month at The Egg & I, Highlands Ranch at 09:30 am.
 3. Bridge Club meets 3rd Friday of every month at 10:00 am at Buck Recreation Center.
 4. Dinner Club (All events are lunch unless otherwise noted): Oct 15th - Red Lobster (Littleton);
Jan 14th - BENIHANA (Denver); Feb 18th - Outback Steakhouse (Littleton); Mar 17th - Imperial Chinese (Denver)
 5. Golf club meets every Thursday from April through Oct of each year.
 6. Hiking Club: Outings on 3rd Wednesday of the month. Check website for Point of Contact for each hike.
 7. Photo Club meets 2nd Thursday every month (except Jun, Jul & Aug) at 1:00 pm at the Bemis Public Library in Littleton
 8. Web Committee meets at 12:00 noon at Sweet Tomatoes, West Bowles, Littleton, on Tuesday prior to BOD/Officer mtg
 9. **Happy Hour** - Oct 9 at Platte River Bar & Grill
 10. **2019** Holiday Celebration - Dec 4 at Pinehurst Country Club
 11. **2020** Annual Meeting -Mar 4 at Pinehurst Country Club
 12. **2020** MARS Senior Recognition Luncheon- July 8 @ TBD
 13. **2020** MARS Day at the Rockies -TBD
 14. **2019** Annual Picnic - TBD
 15. **2019** Car Show - TBD
- Please review dates and times and notify Dick Sosnay (richardsosnay@gmail.com) if you have any changes or additions.



ASSOCIATES

P.O. Box 1128
LITTLETON, CO 80160

PRESORTED STANDARD
US POSTAGE
PAID
LITTLETON, CO
PERMIT NO. 245

ADDRESS SERVICE REQUESTED



DATE: Oct 2019

MARS ASSOCIATES EVENT SCHEDULE

EVENT/MONTH	2019			2020								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Board of Directors		6		8		3		6		1		2
Officers	2	6	3	8	5	3	1	6	3	1	5	2
Bridge Club	18	15	20	17	21	20	17	22	19	17	21	18
Dinner Club	15	12	-	14	18	17	TBD	TBD	TBD	TBD	TBD	TBD
Golf Club	Thur	-	-	-	-	-	Thur	Thur	Thur	Thur	Thur	Thur
Hiking Club	16	20	18	15	19	18	15	20	17	15	19	16
Photo Club	10	14	12	9	13	12	9	14	-	-	-	10
Web Committee	1	5	2	7	4	2	3/31	5	2	30-Jun	4	1
MARS Events												
Happy Hour	9											
Holiday Celebration			4									
Annual Meeting						4						
Senior Recognition Luncheon										8		
CO Rockies Game												
Annual Picnic												TBD
Car Show												TBD
MARS STAR Schedule												
Items due for MARS STAR												
STAR Flyers Due to Comms				2			1			TBD		
STAR Input to Editor				3			2			TBD		
STAR Repro. Deadline	7			13			13			TBD		
STAR Mailing	16			22			22			TBD		