MARS ASSOCIATES
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MARS STAR

MARS STAR has gone digital!!

If you currently receive a printed copy, you will continue to receive a printed copy. If you currently receive an electronic copy and wish to receive a printed copy in the future, contact Carl Kaminski at 303-726-1546 or via email at carlkcol66@gmail.com

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

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MARS STAR

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Bridge	Dave & Kathy Martz	303-683-9524
Car Club	Roger Rieger	303-912-6217
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Golf	Sandy Mossman	303-730-8378
Hiking	Sue Janssen	303-936-8339
Photography	John Chapter (Pres)	303-986-8277

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.

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IMPORTANT PHONE NUMBERS

LM Employee Service Center	1-866-562-2363

MARS Important Phone Numbers
(Be sure to have your MARS ID available)

MARS Delta Dental of CO	
Individual Team (representatives)	1-877-516-6512
Ron Rueger (Account Mgr)	303-889-8616
Assured Partners of CO	
MARS Delta Dental "Vision" (EyeMed)	
MARS Vision Service Plan (VSP)	
Jon Elmore 303-228-2206	
Hudson Howard	720-510-9505
Sharla Leary	720-510-9507
Aetna/Medicare Plus	1-888-562-8111
Kaiser Advantage Plus	303-338-3800

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MARS Website: https://www.marsretirees.org
MARS Facebook:
https://www.facebook.com/groups/MARSAssociates

Cover:

L: NASA's Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (InSight) lander touched down on the surface of Mars on Nov. 26, 2018 and retired in December 2022. See LM News, page 20. Photo Credit: LM

R: Orion arrives home after its Artemis Adventure. See LM News, page 21. Photo Credit: NASA

From the Editor's Desk

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

For comments or corrections, contact Tom (issue editor) or Dan Ellerhorst, 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 Ken Marts
(martshouse2@aol.com)

HAPPY NEW YEAR 2023. By the time you read this, the year will be about a month old. Hopefully, most of you made a few New Year's resolutions and have had the tenacity to stick to several of them. Most studies show that an activity or action becomes a habit after only 21 days of continual practice. If you're still trying to get to that 21st day, have perseverance with the realization that good things come with practice. You'll eventually get there and be happy with your accomplishment.

I was overwhelmed at the December Holiday celebration last month with the attendance, gifting to Marines "Toys for Tots," the meal served, the music provided by Colorado Christian University, and the friendship shared among those attending. The holidays are a great time to share our joy with one another and those in need. Thanks to Linda Duby for her great work in organizing this event.

I'm looking forward to a GREAT year with MARS Associates and the Special Activities that our Marketing Committee (now headed by a name familiar to you, Dick Sosnay) has planned in combination with the quarterly Happy Hours, Spring Event & Annual Meeting, Summer and Senior Recognition Luncheon, Rockies Baseball, Picnic, and year-ending Holiday Celebration. I look forward to seeing many of you at these activities.

There are several changes coming to MARS Associates that should be relatively transparent to you. First, as you were made aware in the October MARS STAR, we have a new web platform that will be coming on-line in late March/early April. This will occur after the annual 2023 renewal cycle. We will make this site available for viewing at a later date when it has matured a bit. The new web platform is being introduced for users of devices other than computers (tablets and other mobile devices) and to ease the burden of updating by the webmaster. More on this from Dan Ellerhorst, in his article for this issue of the MARS STAR.

Another change you'll see is several new officers and Directors. Dan Ellerhorst will be the VP of Communications in an expanded role of what this has been in the past. Dan's write-up will detail his visions for this role. We'll also will have a new VP of Business. Bill Schrott filled this role admirably but is stepping down to allow another, as yet unnamed, person to fill his shoes. As mentioned earlier, Dick Sosnay is taking over as head of Marketing. Pete Munoz has accepted an invitation to become a director and there may be one or two new Directors added in the first quarter of 2023.

You should also see expanded communication from MARS Associates via the new webpage, Marketing Committee updates, Facebook page, and mass mailers on our activities. If you're not a member of the MARS Associates Facebook page, consider contacting Barb Sande barbsande@comcast.net) to join and view her daily updates on "What happened on this day in history". You don't have to share any of your personal information or contribute to the page (which is optional), but it is still a good source of information related to MARS.

The core success of an organization is how well we serve our members. The main source of information for us is to hear from our members via email, Facebook, phone calls, or just catching one of the Officers or Directors at our many activities and sharing your thoughts. The new website will have a "Suggestion Box" where you can share your ideas with us. What do you like, what would you like to see improved or changed, what activities would you like to see us offer, or what activities would you like to lead!

MARS Associates is also in need of several volunteers to help us thru the coming year. The Marketing Committee is always in need of fresh ideas for Special Activities and leaders to organize these activities. Contact is Dick Sosnay (richardsosnay@gmail.com).

There are also several openings for Officers and Directors (VP of Business, President-elect, and Director at large). Contact is Roger Rieger (rrieger10731@gmail.com).

Next Up

TBD

Director's Notepad

By Roger Rieger
Chairperson, BoD
(rrieger10731@gmail.com)

Greetings everyone! Hope you continue to enjoy some of the many new activities put on by your MARS Associates club this year. Ideas for these new events often start within the MARS Marketing committee which

is now led by Dick Sosnay as he and Bill Wise transition leadership going forward in 2023. Thank you, Bill, for your leadership and ability to bring new ideas forward for our MARS members. Please join me also in welcoming our newest Board member - Pete Munoz who has agreed to join the board in 2023. I look forward to Pete's enthusiasm, energy, and new ideas as we look forward to 2023 and beyond.

Your club has many many talented people, with a variety of interests and it's great to see new volunteers step forward and share those talents with our members. If you would like to be part of this process, please join the marketing committee, they are always seeking new ideas and members. To join the marketing team, just reach out to Dick, or any of the BOD members or MARS Officers and let us know your interests! Without new volunteers and their energy, your club will stagnate and eventually cease to exist!

Activities Updates

By Linda Duby
(lindaduby@comcast.net)

Happy New Year! Now that the holidays are over, the planning for events in 2023 is in full swing. We are hoping to see more members attend events in 2023.

The 2022 Holiday Celebration was held at the Wellshire Event Center on December 7. There were 150 reservations for MARS members and their guests. We also had two guests from Lockheed Martin's Human Resources – Kelly Condon and Jon Mallette. We also had four students from Colorado Christian University perform Christmas songs at the event. And, Toys for Tots was represented by two Marines. As usual, our members made very generous contributions to Toys for Tots. The Wellshire did a great job with the food and the service was excellent.

The first MARS event in 2023 will be a happy hour on Wednesday, January 25, 4:00 p.m. to 6:30 p.m. at the Platte River Bar & Grill. Please make a reservation on EventBright so we have an idea of headcount for the restaurant. The link to the event is on the MARS website (https://www.marsretirees.org) and here: https://www.eventbrite.com/e/mars-associates-winter-happy-hour-tickets-501035720327.

On March 1, 2023 the MARS Spring Event and Annual Meeting will be held at the Arrowhead Golf Club located in Roxborough. The format for this event is new this year. Instead of a luncheon, we are having a more casual event from 1:00 p.m. to 4:00 p.m. and will have a buffet of hors d'oeurves along with a cash bar. The speaker will be from United Launch Alliance. The flyer for this event is included in this edition of the STAR and is available on the MARS website (https://www.marsretirees.org). There are two options for making reservations – mail in the coupon on the flyer with a check or make a reservation and payment electronically by using the STRIPE link on the flyer.

The other events and happy hours for 2023 are in the planning stages as are the special events. Check out the website for updates.

Business

By William Schrott
(wmschrott@msn.com)

Hope everyone had a happy and safe holiday celebration. My relatives in Buffalo, New York had to wait two days to celebrate Christmas. Glad we decided not to go there this year.

We were fortunate to have two "Medicare 101" classes in 2022. Because of their popularity, there will be two classes in 2023; they are scheduled for May and September. If you are near retirement, or you need to understand your Medicare benefits, this is the class to attend. Look for a "blast" email for details.

In the last few STAR issues, I have mentioned the benefits available to retirees from VIA Benefits. This includes $900 that LMCO has made available to reimbursement you to pay medical bills not covered by your insurance. VIA Benefits will also help you find potential better insurance coverage; personally, I found better dental cover though them.

Go to the MARS website and highlight the medical benefits box, to go to the VIA Benefits website.

Communications

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

After several very successful terms as VP of Communications, Mike Carroll has decided to step down from this office, but, happily, he has agreed to continue

to organize the MARS STAR publication. Under Mike's tenure as VP of Communications, the effort associated with printing, assembling, labeling, and mailing the STAR has been reduced by at least an order of magnitude and can now be accomplished by one or two people in a few hours. A significant reduction in the effort was due to our transition to a digital version of the STAR, and we appreciate that the vast majority of members have adapted successfully to it.

You may have read in recent editions of the STAR about our plans to transition the current MARS website to a different software platform and look-and-feel. In so doing, we will be able to upgrade to a more modern and sustainable environment, provide a more friendly user interface for mobile devices, and most importantly, reduce the workload on the webmaster by distributing administrative and content editor roles to more people. Jim Kummer has been serving us admirably as webmaster for many years, but he has been ready to relinquish that task for a little while now. We owe Jim a great debt of gratitude for his past service and for his assistance during this transition period.

Let me provide a few words on how this transition is progressing and when the switch over will occur and be visible to the membership. Our new baseline uses Dreamhost for web hosting and domain name registration and Wordpress for our website content management system. Wordpress is used by over 40% of the top 10 million websites as of October 2021, according to wikipedia.

We have acquired both products and set up a parallel beta site for the MARS Retirees website. We have identified volunteer content editors from the officers, directors, and clubs to maintain the information for which they are responsible, and we have scheduled training sessions for them. In February, we will be editing the beta site to make it current with the information in the existing MARS website. We will open the website access first to a select group of beta users, and then to the entire membership. After the beta test period, we will do a switchover of the marsretirees.org domain name to the new website. This is expected to be around April 1st.

We are concurrently transitioning our digital archive and e-mail capabilities to new software baselines. In the future, both capabilities will be easier to use and maintain.

I was motivated to volunteer for this position when Mike decided to step down because I am interested in helping to integrate and modernize the MARS Associates communications capabilities. I am sure we will have some hiccups along the way, and I welcome your feedback about what you think might be better. I believe that between the MARS STAR, our website, our Facebook page, and an enhanced e-mail system we will be able to reach each of our members with relevant and timely information in ways that conform to your preferences.

Membership Report

By Carl Kaminski
(carlkcol66@gmail.com)

MEMBERSHIP STATISTICS

As of January 1, 2023, there are 1,339 MARS Associates members, including 662 senior members. We have a total of 110 new members who have joined MARS in the 2022 CY.

Please welcome the following new members who have joined this quarter:

Colorado

Arvada	George Cain & Karen Keelen-Cain
Aurora	Tom Desmond
Castle Pines	Beth Buck & Bill Nugen, Ernie & Amy Inn
Centennial	Annette Marstiller
Colorado Springs	Jane & Jim Hlavaty, Gary & Mary Munda
Franktown	Steve Nickerson
Greenwood Village	Beth & Neal King
Highlands Ranch	Mickey & Jeannine Clemons, Ken Dehaan, Tim Hartman, Jeannie Macdonald
Lakewood	Diane Campbell, Ted & Sue Moore
Littleton	Jim & Sue Becia, Molly Bowles, Peter Burns, Tim Gasparrini, Janet & Scott Nold, Jim & Mary Pennington, Darrell & Kathryn Root, Erlinda Stafford, Chip & Kelly Woods
Parker	Kevin Maccary
Roxborough	John Fasciani

Other States

Florida

Orlando Dave Miller

New Mexico

Albuquerque Mark & Julie Ludwig

Pennsylvania

Collingdale Tom & Claire Walsh

Membership Renewal

Once again, it's time for membership renewal. Since so many of our communications are presently via email, it would be helpful to include your current email address even if you haven't changed it recently. This will help ensure we have the correct address on file. Also, several members have suggested that their spouse/significant-other would like to receive MARS communications so we have added this option on the 2023 form. There is a hard copy of the renewal form contained in this issue of the STAR. In addition, clicking on the Membership tab from the main page of the MARS Retirees website (https://www.marsretirees.org/MembershipOnline.html) will provide access to a form which can be downloaded, filled out and printed for mail-in. You can type directly into this form from your web browser and print it out or print the blank form and fill it in. Either approach should work. Also, you can renew directly online by selecting the red 'Renew' button under Membership Online Processing. This will allow you to pay via credit card and save the hassle of mailing your renewal form and payment via USPS. If you have any questions contact Carl Kaminski directly at 303-726-1546.

NEW MEMBERS

Do you know someone who recently retired from LM or ULA? First year membership in MARS is free for 2023. Direct them to the website for more information or have them contact one of the Officers or Directors.

Change of email address or phone number?

Given the rapidly changing environment we are all dealing with, it's more important than ever that we have current email and phone information for our members. 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 communications are timely.

In Memoriam

By Norma Emerson (emer801@msn.com)

Please contact me at the above email 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 Memoriam section.
MARS Associates expresses our deepest sympathy in the loss of your loved one and a donation will be made to a charity chosen by the Officers and Board of Directors in their memory.

Members

Amsler, Larry (D: November 2022)
(Survived by Patricia Ann Amsler)
Centennial, CO
https://tinyurl.com/4cfv7w67

Brennenstuhl, Robert "Bob" (D: August 2022)
(Survived by Sarah Brennenstuhl)
Castle Rock, CO
https://tinyurl.com/m5n3hhfu

Bundy, Barbara (D: December 2022)
(Survived by Larry Bundy)
Castle Pines, CO
https://tinyurl.com/34e7mkd6

Cox, William "Bill" (D: December 2022)
Littleton, CO
https://tinyurl.com/438un8pu

Lambert, Edward (D: November 2022)
Centennial, CO
https://tinyurl.com/9jfbrsbv

Thompson, Jack (D: October 2022)
(Survived by Carolyn Malaby)
Centennial, CO
https://tinyurl.com/4nmmrv84

Wilson, John (D: October 2022)
(Survived by Joyce Harmon)
Littleton, CO
https://tinyurl.com/mnyxdrnp

Non-Members

Bacon, Keith (D: November 2022)
Littleton, CO
https://tinyurl.com/bdd4z2jp

Byers, Larry (D: November 2022)
Littleton, CO
No obituary published

Davis, Sr., Marvin (D: December 2022)
Merritt Island, FL

https://tinyurl.com/yhch7tzp

Donathan, Marjorie (D: December 2022)
Littleton, CO
https://tinyurl.com/3cyphcw2

Grande, Beverly "Bev" (D: November 2022)
(Survived by Louis "Lou" Grande)
Denver, CO
https://tinyurl.com/2p9488ns

Greichen, James "Jim" (D: September 2022)
Denver, CO
https://tinyurl.com/vfnhzk5u

Kays, Janice McCready (D: November 2022)
Leawood, KS
No obituary published

Ostrander, Damon (D: December 2022)
(Survived by Arleen Ostrander)
Littleton, CO
No obituary published

Roe, Garland (D: December 2022)
Denver, CO
https://tinyurl.com/698kem4r

Teegarden, Joann (D: November 2022)
Panama City Beach, FL
https://tinyurl.com/3j5kvy58

Teegarden, Walter "Walt" (D: August 2020)
Grapevine, TX
https://tinyurl.com/3n5mkyyf

Wright. Leroy (D: October 2022)
Cocoa, FL
https://tinyurl.com/2s4k9sys

Marketing Committee

By Richard Sosnay
(richardsosnay@gmail.com)

Now that I have finished my term as president, I wanted to continue with other MARS activities, so I have volunteered to take over running the Marketing Committee from Ken Marts and Bill Wise. They did such a great job last year, that I hope will continue with their successes. The purpose of the marketing committee is twofold, including: 1) Continue to improve activities and events for MARS Association so that it is more fun and rewarding for current MARS members, and prospective retirees from both LM and ULA, and 2) enhance the image of MARS when we reach out and market MARS to retirees from LM and ULA. To do that, the marketing committee started Happy Hours several years ago, and started special activities (in addition to our 5 major events) last year.

Last Year we had 9 Special Activities with about 250 participants and 4 Happy Hours with several hundred more participants. We want to continue that this year! To do that we started at our Holiday Celebration Luncheon with Posterboards and sign-up sheets for a whole new set of activities this year, as summarized below:

Event	~Cost	Date/Tim	Comments
ULA Plant Tour	Free	Spring 2023	
LM Waterton Campus Tour	Free	Spring 2023	
Central City Opera	TBD	Summer 2023	
Georgetown Loop Railroad	$49/each	Fall 2023	(1)
Cripple Creek Train	$15/each	Late Spring 2023	
Manitou (Pikes Peak) Railway	$68/each	Summer 2023	(2)
Cherokee Ranch and Castle	TBD	TBD	
Balloon Lift-off and Glow	TBD	Labor Day 2023	
Dinner Theaters	TBD	TBD	
Arvada Center for Performing Arts	TBD	TBD	
Wine Tasting	TBD	TBD	
Distillery Tours	TBD	TBD	
Colorado Wildlife Sanctuary	$30-50ea	TBD	
WWII Museum of Aviation	TBD	TBD	

(1) Includes Optional Mine tour & Gold panning
(2) Zoo & Lunch extra

We are currently in the process of determining the following:

1) Are you interested in joining in and attending an activity? If so, how many people would attend?
2) Are you interested in leading that activity?
3) Do you have any thoughts on other activities that you think would be fun for MARS members? And would you be willing to lead that activity?

If you answered yes to any of the above, please send me an email at richardsosnay@gmail.com and tell me your thoughts. We started gathering some data at our Holiday Luncheon and hope to get more responses from this article, and we will be sending out a blast email soliciting your response. Once we have determined those activities that has sufficient interest, and a leader volunteering to lead that activity, we will then contact MARS members with more specifics about that activity, including date, time, locations, costs, other specifics and how to sign up.

As always, we appreciate your feedback so that we can continue to plan special fun activities for MARS members.

The marketing committee meets via Zoom in the week prior to the officers/directors meeting, generally in the last week of the month. This is a great opportunity for you to have an impact on the future of MARS; getting new ideas and fresh perspectives is key to the committee's success. If you are interested in joining the marketing committee, please let me know. You don't need to make a long-term commitment, even if you want to attend a few times to get your ideas into the committee, let me know.

The MARS Associates Website

By Jim Kummer
(jkummer@comcast.net)

The MARS Website Committee continues working toward implementing the new look on the website using WordPress, a more modern tool for designing and building websites. We should be prepared to roll out the new rendition of the website by the end of first quarter this year. The implementation of the new website using WordPress should entail a much lighter workload for those responsible for updating the website content. WordPress needs much less management than the prior format.

WordPress operates more effectively on multiple platforms – Macs, PCs, tablets, and cellphones, where screen size is somewhat of a problem for the old implementation. Moreover, it is easier to update, allowing more individuals to effect updates.

Watch for the unveiling of the new website, coming soon.

Volunteers of America - Colorado & Special Olympics - Colorado

By: Kevin Maccary
(maccary5@gmail.com)

So what now? Years of education followed by a lifetime of practical experience on a career where the pay was good, the work meaningful, and where you knew that your efforts contributed to the betterment of life and freedom for so many people. You used to be energetic, engaged, and sometimes a "game changer" in the lives of other people. Those were the days, huh?! Miss them? Here is an idea. Get a job that you absolutely love that can take advantage of your skills and talents. Make it one where the pay is mind boggling (and tax free) and where you can see for yourself the positive impact of your efforts. And as a MARS member you are entitled to all the benefits described above including the secret recipe to make it all happen. And I am now going let you in on the secret recipe that worked for me.

After spending 30 years in the Army along with a career at Lockheed Martin/ULA, I retired fearful of becoming irrelevant and without purpose beyond producing a slide show of the most adorable grandkids in recorded history. I never understood the appeal of fishing and saw golf as the greatest threat to my emotional and financial stability. I stared into the abyss that I felt was my future fate hoping to find that formula that could change that. That's when I found it -- Volunteering. In a society long on problems and challenges while often short on compassion and solutions, I discovered that years of living and learning was the perfect preparation for my next career. And this career has been incredibly fun, emotionally rewarding, intellectually challenging, aperture opening and all the while impacting in a positive way the lives of so many deserving people.

I filled my schedule starting with the many incredible programs at Volunteers of America - Colorado. I found that delivering Meals on Wheels to seniors and tutoring reading to early elementary students lagging in that essential skill was incredibly rewarding and learned a lot about the power of simple positive support to others. Spending 2 weeks a summer at Camp Postcard with up to 90 inner city middle school kids at risk working alongside amazing "counselors", who were actually police officers from Denver and Aurora, taught me that open minds improve listening skills. When the secret real jobs of the counselors were revealed to the kids at the end of each session, the lasting impact of that investment of time, talent, and personal sharing was priceless.

I confess I did ultimately bow to the pressure applied by some fellow retirees regarding punishing that little dimpled ball around 18 holes. Being greedy for more self-actualization, I contacted Special Olympics - Colorado (SOCO) and asked if there was a place for me where I could meet my need to be relevant while having fun. The SOCO response was crystal clear. Since posing that question I have coached flag football, bocce, basketball soccer, bowling, and GOLF. It's true. In the end, I could not avoid that sadistic Scottish torture posing as a sport. But now I can honestly say I am a golf coach and as long as I don't go out and personally play a round, my secret is safe. As they say, those who can …play, and those who can't …coach. And those who want to make a difference in the life of some very special people… coach Special Olympics.

Retirement was not the end but rather a beginning where I could follow my passion for helping others and

making a difference. And the more I volunteer, the more I receive in every way that is important. I am where I should be and doing what I was meant to do. I think that defines what I call happiness. And I do have that slide show of grandchild pictures if anyone is interested.

Historian Corner

By Barb Sande
(barbsande@comcast.net)

ANNOUNCEMENT: In 2023, I will be exploring the Skylab missions for their 50th anniversary. I am calling all retired folks who worked on Skylab to consider writing a short story, anecdote, or technical problem that they were involved with during the development of Skylab (include short biographical details). Please submit these written stories to me by July 31, 2023 through email (see above). They can be an email text or a short-attached document (MS Word or Pages is fine) and pictures are also welcome if you have some. These stories will be included in a write-up later in 2023 that summarizes the Skylab initiative. Written stories only, please! I have no plans to do a roundtable or accept oral stories on a phone call.

Program Profile

This issue profiles the Apollo 17 mission, the third "J" extended mission to the moon and the last lunar landing of the Apollo era.

Apollo 17 Mission Overview

Launched: 12/07/1972 05:33:00 UTC LC-39A, KSC
Splashdown: 12/19/1972 19:24:59 UTC, South Pacific, USS *Ticonderoga* recovery ship
Saturn V AS-511 Launch Vehicle
CSM (Command/Service Module) Call Sign: *America* (CSM-114)
LM (Lunar Module) Call Sign: *Challenger (*LM-12)
Crew: Commander Eugene A. "Gene" Cernan, LM Pilot Harrison H. "Jack" Schmitt, CM Pilot Ronald E. Evans
75 total lunar orbits
Landing site: Taurus-Littrow – 20.1908 Degrees North, 30.7717 Degrees E Lunar coordinates
Third and final "J" mission (expanded science operations, use of a lunar rover, extended lunar stay, expanded CM science operations)
Connection to Lockheed Martin/ULA: The contributions of our heritage companies to the Apollo program were listed in the MARS STAR article about Apollo 11 in 2019.

Preparations Begin for the Final Lunar Mission

In a tentative schedule set forth in 1969, Apollo 17 was planned for September 1971. The near-disaster of Apollo 13 led to delays and a maximum of two missions a year. Following the cancellations of Apollo 19 and 20 in early 1970 and Apollo 18 in September 1970, Apollo 17 was moved to a December, 1972 launch. Funding for the mission was threatened by the White House until this date was selected; President Nixon wanted Apollo 17 to occur after the 1972 election after the near-disaster of Apollo 13.

Apollo 17 Crew: Harrison Schmitt, LM Pilot; Ron Evans, CM Pilot; Gene Cernan (seated) Commander --Photo Credit: NASA

The cancellation of Apollo 18 also led to changes to the designated crew by removing Joe Engle as LM Pilot and substituting a geologist in that role, leading to the assignment of Harrison Schmitt to Apollo 17 (not a popular decision initially with Commander Cernan). Schmitt joined commander Gene Cernan and CM Ron Evans and the crew complement was announced to the public on August 13, 1971. The backup crews at this point were seasoned veterans of previous missions so that astronauts who had not flown could move on to new programs. The original backup crew announced in August, 1971, was the crew of Apollo 15 (Dave Scott, Jim Irwin and Al Worden). After the postal cover incident was revealed, the backup crew became John Young, Charlie Duke and Stuart Roosa. Roosa flew on Apollo 14, while Young and Duke were on the Apollo 16 mission (Ken Mattingly, Apollo 16 CM pilot, asked to move on to support of the Space Shuttle program).

Apollo 17 was the third "J" mission and the final opportunity to explore another geological region on the Moon. Several locations were discussed, including the massive Tycho crater and a possible site on the far side of the moon before the scientists and engineers unanimously agreed on the Taurus-Littrow valley. It was anticipated that old highland material could be found in this area, along with evidence of a younger

explosive volcano event. The location was announced to the public in February, 1972. The crew did extensive geology field trips, now aided by the expertise of crew member Schmitt, who had advised previous Apollo crews on how to describe geological formations after his selection as a scientist-astronaut in 1965.

Components began arriving for the mission in October, 1970 and testing and mating processes were underway shortly thereafter. The vehicle stages were erected in the Vehicle Assembly Building starting on May 15, 1972 and Apollo 17 was rolled out to pad LC-39A on August 28. Countdown demonstration tests were accomplished on November 20 and 21 and the countdown for launch was initiated on December 5, 1972.

Launch of Apollo 17, Translunar Trajectory

The launch was initially planned for 9:53 pm EST on December 6, the only nighttime launch of an Apollo mission. A delay occurred due to an automatic cut-off in the launch sequencer at the T-30 seconds. The cause was quickly determined to be the launch sequencer's failure to automatically pressure the LOX tank on the third stage. The pressurization was done manually by launch control, but the sequencer did not recognize the fix. The clock was reset and held at the T-22 minute-mark while workarounds were incorporated in the sequencer. The countdown then resumed and liftoff occurred at 12:33 EST on December 7, 1972. I remember this countdown and launch quite vividly. It was a school night - I was in my senior year of high school and planning to go into Engineering school at CU Boulder in September, 1973 - but I was not about to go to bed before Apollo 17 lifted off and I anxiously waited for the countdown to resume. Apparently, there were over 500,000 people lining the beaches and rivers near the Cape to see this spectacle and it was visible as far away as 800 miles from KSC; I was reminded of that beautiful launch when seeing the late-night launch of Artemis 1 in November, 2022.

At 3:46 EST, after a smooth ascent and insertion into Earth orbit, the S-IVB third stage was reignited for the 351-second trans-lunar trajectory burn; the trajectory was modified to allow Apollo 17 to reach the moon at the original planned mission elapsed time, despite the nearly three-hour launch delay. The LM was extracted from the S-IVB stage with no difficulties. On the third day enroute to the moon, the crew executed a mid-course correction and checked out equipment in the LM. Mission clocks were moved ahead by 2 hours and 40 minutes to make up for the launch delay. During this outbound trip, the crew took the famous "Blue Marble" photograph of Earth.

The Blue Marble Earth Photo Credit: NASA

Launch of Apollo 17 Photo Credit: NASA

Lunar Orbit, Descent to the Surface

At 2:47 pm EST on December 10, the Service Propulsion Engine on the Command/Service Module fired, inserting Apollo 17 into lunar orbit. A second burn on the third orbit lowered their orbit to only 14.9 nautical miles above the surface. Preparations began for the landing on December 11, approximately 24 hours later. LM *Challenger* separated from CM *America* and the two spacecraft flew in formation for some time, checking for any damage or other concerns. The LM began its descent burn at 112:49:56 elapsed mission time. Evans, remaining behind in the CM, circularized the orbit and waited on confirmation. Touchdown occurred at 113:04:58 mission elapsed time (2:55 EST), about 656 feet (200 meters) east of the planned landing point. An interesting commentary in the Apollo Surface Journal talks about what Gene Cernan experienced in that moment:

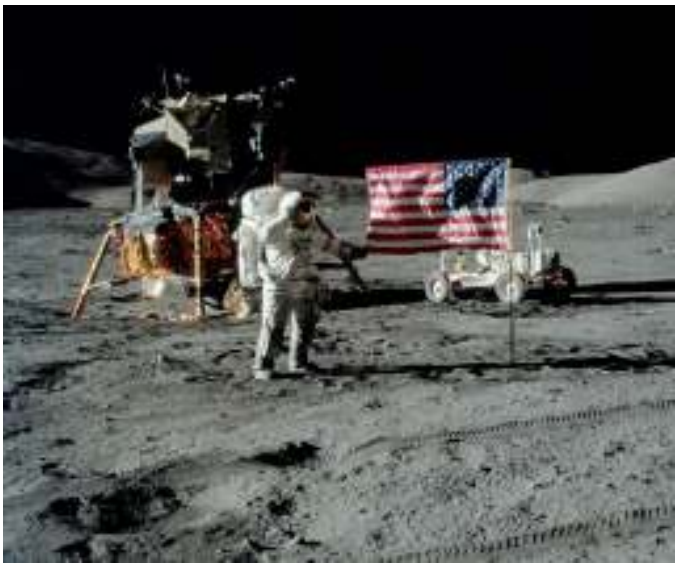
Journal Contributor Jim Scotti writes, "I once asked Gene Cernan what sort of sounds he had heard as he landed on the Moon, hoping to get answers to these kinds of questions - how loud the thrusters were, could

he hear the descent engine, what about pumps and switches and anything else. What he said was rather different than what I was expecting. He said that what he heard in the moments after landing was... silence! You see, before landing, he was so engrossed in the activity that he heard Jack calling out numbers and the occasional call from Houston and everything else blended into the background because he was so focused on the task of landing. At touchdown, however, the spacecraft fell silent and mission control was staying quiet to try not to interfere with what they expected was the final moments of touchdown. And Gene added: 'And the guy standing next to me [Schmitt] was struck silent staring out the window looking at the surface and he sure wasn't saying anything!' So, Gene noticed the silence. Cool perspective!

The crew began preparations for the first EVA, planned for four hours after landing. Although all three crew members had a very long day with the activities so far, Cernan and Schmitt did not want to waste any time on rest until after they had an opportunity for surface operations.

EVA-1

Cernan descended the ladder and was on the footpad at 6:45 pm EST. His words were: "I'm on the footpad. And Houston, as I step off at the surface at Taurus-Littrow, we'd like to dedicate the first step of Apollo 17 to all those who made it possible". His first step on the surface was nearly a disaster, as the surface next to the footpad sloped and had slick tiny pebbles that cause him to lose his footing (he was still hanging on to the LM steps). Schmitt followed right behind him and deployment of the Lunar Roving Vehicle (LRV) was the first major task. While working near the LRV, Cernan caught his hammer under the right-rear fender extension and accidentally broke it off. This wasn't a critical issue, but it did result in both astronauts being covered in layers of dust during the first drive. The LRV contained two new scientific instruments, the Traverse Gravimeter Experiment (TGE) and the Surface Electrical Properties (SEP) experiment. The TGE experiment was quite successful, with 26 measurements taken during the three EVAs. The SEP measurements of the lunar regolith (top layers of soil) found that there is almost no water in that region of the moon, down to a depth of 1.2 miles.



Gene Cernan salutes the flag with Challenger and the LRV in the background Photo Credit: NASA

The TV camera was set up on the rover, and was test-driven, then the crew deployed the ALSEP (Apollo Lunar Surface Experiment Package) just west of the landing site.

They had difficulties drilling the core holes, shortening the time they had to drive around the site. They drove to Steno crater, south of the landing and obtained subsurface samples and deployed explosive packages for later remote detonation to record results on the growing network of lunar seismometers. One thing that was interesting was that the Earth in this location and timeframe on the moon was seen much lower on the horizon and was quite prominent in front of the two men when they were landing and on the surface. As they worked during the first EVA, Cernan told Schmitt to take a few minutes and just look at the Earth. Schmitt bantered around, saying "Ah, You seen one Earth, you've seen them all". Cernan later made these intriguing comments for the Apollo Surface Journal interviewers:

Obviously, Jack [Schmitt] and I have looked at the Earth differently. I think we had very different subconscious views of what we saw. That's always been true and it's probably true in all twelve guys. To me, the Earth was a very dominant part of our mission. It certainly made a statement. You could hardly not notice that it was visible. It was a dominant presence in our valley, without question. For Jim Irwin [Apollo 15 LM pilot], going to the Moon was a religious experience and, for me, it was a spiritual experience in terms of being there and looking back at the Earth, realizing the significance of what was going on. …But the mission did bring home to me, very clearly, that Science has a long way to go yet to find an answer for the creation of the small part of the Universe that I was privileged to see. It doesn't make any difference who your God is or how you address him; the Earth was just too beautiful to have

happened by accident. There has to be somebody bigger than me who put it together. And when I say spiritual, that's what I mean.

The first EVA ended after seven hours and twelve minutes and the tired astronauts spent the next 17 hours in the LM.

EVA-2

The first task performed by Cernan and Schmitt was to find a fix for the fender problem on the LRV. They taped together four stiff paper maps, making a replacement fender extension that seems to work fairly-well until near the end of the third EVA. They then departed for Station 2, the Nansen Crater at the foot of the South Massif Mountain. The distance to this location was 4.7 miles away from the LM, the furthest distance traveled to date by any spacefarers from the safe harbor of their spacecraft. They started a trajectory back, stopping at various stations on the way and collecting samples and taking photographs.

At Station 3, a small crater, Schmitt fell to the ground while working, looking quite awkward. Mission Control joked about phone calls coming in asking for Schmitt to join the Houston Ballet, so this small crater was renamed Ballet Crater in 2019 in honor of this minor incident. Cernan collected some samples in a vacuum tube at this site that he recommended keeping in storage until better analytical techniques were developed; this was one of the lunar samples opened this year (2022), looking for any residual gases trapped in the sample. The analysis is still in work.

The next station (4) yielded one of the more interesting finds of the mission. Schmitt spotted orange soil at this station (Shorty Crater), which led to extensive discussions and sample-digging, along with directions to Ron Evans in the CM to observe the area with the Apollo Lunar Sounder Experiment (ALSE). The ALSE used radar equipment to map lunar topography and variations in subsurface electrical conductivity. Evans was able to see orange coloration in various areas from orbit using this instrument and visual observations. The orange color of the soil got everything thinking about oxidation of the material, which implies water. Schmitt, in his eagerness to gather samples, fell or lost his balance a couple of times during this stop, easily bouncing back up in the 1/6 gravity of the moon. The material turned out to be ancient volcanic glass, as noted in these comments by Schmitt in the Apollo Surface Journal:

It was volcanic material, but it was volcanic glass that had been spewed out of some fire-fountain-like eruptions 3.5 billion years ago that somehow had been protected from mixing with anything else, even though it was now at the surface. It had almost certainly been covered almost immediately by a lava flow, so that it was protected from meteor disruption and stirring. And then, when Shorty formed, somehow the pyroclastic ended up in the rim and a few other places in nearly pure form.

Shorty Crater Orange Soil, EVA-2 Photo Credit NASA

The last stop on the EVA was at Station 5 at a site called Camelot Crater. The pair of explorers had collected 75 pounds of samples, took seven gravimeter measurements, and deployed three more explosive packages. They concluded the EVA after seven hours and thirty-seven minutes, traveling further away from home base and covering more ground than any other human spacefarers to date. The fender repair worked and earned Schmitt and Cernan honorary Autobody Association of America lifetime memberships. The astronauts rested, glad to have the gloves off their hands for a few hours (they had issues with lifting of fingernails and blisters on their knuckles, which could be quite painful).

EVA-3

The third and last EVA and last moonwalk of the Apollo program began at 5:25 pm EST on December 13. They headed out on the LRV to Station 6, a huge boulder dubbed Tracy's Rock (after Cernan's daughter). Additional stops were made at Stations 7 and 8 (located at the base of a feature known as the Sculptured Hills). The final stop at Station 9 was at a feature called Van Serg crater. During these three stops, the increasingly fatigued astronauts collected 146 pounds of samples and did another nine gravimeter measurements. At Station 9, Schmitt found an unusual-looking fine-grains rock that weighed over 17 pounds (the largest single sample from the Apollo 17 mission). A small piece of this sample 70215 is on display at the Smithsonian Institution as a

"touch sample" for visitors. Another sample from Station 6 was identified as the oldest known "unshocked" lunar rock (it had not been affected by any high-impact events). This sample of troctolite (sample 76535) is considered one of the most interesting samples returned from the moon and has been used to substantiate the geological timeline of the moon and the theory of a metallic core dynamo in the interior of the moon, creating a magnetic field. It likely would have been overlooked without geologist Schmitt's presence.

Troctolite Sample 76535 EVA-3 Photo Credit: NASA

The crew returned to the LM, closing out the final EVA by collecting a breccia rock (common lunar material) for a project for students from 70 countries who were touring the Mission Control Center and observing the activities. This rock became known as the Friendship Rock and tiny samples were distributed to those 70 nations. The crew also put out a plaque commemorating the mission. Cernan had these words to say, from the Apollo Lunar Surface Journal:

And I'll read what that plaque says to you. First of all, it has a picture of the world. Two pictures. One of the North America and one of South America. The other covers the other half of the world including Africa, Asia, Europe, Australia, covers the North Pole and the South Pole. In between these two hemispheres, we have a pictorial view of the Moon, a pictorial view of where all the Apollo landings have been made; so that when this plaque is seen again by others who come, they will know where it all started. The words are, "Here man completed his first exploration of the Moon, December 1972 A.D. May the spirit of peace in which we came be reflected in the lives of all mankind." It's signed, "Eugene A. Cernan, Ronald E. Evans, Harrison H. Schmitt, and most prominently, Richard M. Nixon, President of the United States of America." This is our commemoration that will be here until someone like us, until some of you who are out there, who are the promise of the future, come back to read it again and to further the exploration and the meaning of Apollo.

As Cernan concluded the EVA (over seven hours again), he also made this statement:

I'm on the surface; and, as I take man's last step from the surface, back home for some time to come – but we believe not too long into the future – I'd like to just [say] what I believe history will record. That America's challenge of today has forged man's destiny of tomorrow. And, as we leave the Moon at Taurus–Littrow, we leave as we came and, God willing, as we shall return, with peace and hope for all mankind. "Godspeed the crew of Apollo 17.

It is particularly touching, but also thrilling to read these words spoken 50 years ago as Project Artemis and Orion are finally underway and many contracts are in work for lunar orbital and surface operations again!

America in Orbit; Rendezvous and Docking

While *Challenger* was on the surface, CM Pilot Ron Evans was kept busy with a variety of scientific and observational tasks. He circularized the orbit of the CSM so that he could observe features at the same distance.

A Last Look at Apollo 17 Site Photo Credit: NASA

The Service Module housed a scientific instrument module (SIM) with three new experiments on-board: A lunar sounder, an infrared scanning radiometer, and a far-ultraviolet spectrometer. The SIM also had the same instruments as previous flights, including a mapping camera, a panoramic camera, and a laser altimeter. The CM also had a biological cosmic ray experiment (BIOCORE) with five pocket mice, who were dubbed Fe, Fi, Fo, Fum and Phooey by the crew. Four of the five mice survived the flight and had some health issues upon return that were not related to cosmic rays.

The lunar sounder beamed electromagnetic impulses toward the lunar surface to help develop a geological model of the interior. The radiometer created a temperature map of the surface, and the far-ultraviolet spectrometer was used to obtain information on the thin lunar atmosphere. Evans operated these instruments and did many observations and photographs, confirming the orange-colored material and seeing other colors on the surface.

Cernan and Schmitt successfully lifted off from the lunar service at 5:54 pm EST on December 14. Rendezvous and docking with *America* took place about two hours later. All of the samples were transferred, along with equipment and the ascent stage was jettisoned at 11:51 pm EST. The ascent stage impact on the lunar surface was recorded by the seismometers left by the various missions.

Challenger Returns to Earth

At 6:35 pm EST on December 16, the CSM's SPS engine ignited for just over two minutes to propel the spacecraft away from lunar orbit and on a trajectory back to Earth. Evans performed a 65-minute EVA to retrieve the film cassettes from the SIM bay in the service module. He did this at 160,000 nautical miles from Earth, with assistance from Schmitt standing in the CM's hatch. Only three deep-space EVAs have been performed so far and this was the last EVA of the Apollo lunar program.

The crew performed more experiments with the infrared radiometer and the ultraviolet spectrometer. Only one minor course correction was required and on December 19, the SM was jettisoned, leaving only the CM for re-entry. *America* reentered Earth's atmosphere and splashed down safely in the Pacific Ocean at 2:25 pm EST, only 6.4 miles from the recovery ship USS *Ticonderoga.* Mission Control in Houston was packed with many former flight controllers and astronauts celebrating the end of the last Apollo mission.
None of the three astronauts flew again in space. Short biographies are included below. *America* is on display at the Johnson Space Center in Houston, Texas and Gene Cernan's spacesuit is in the collection of the Smithsonian Institute. The last Apollo mission was a resounding success and we all hope and pray for a revitalization of lunar exploration with the Artemis program and some of the commercial entities now involved in space activities.

Eugene A. (Andrew) Cernan Biography

Gene Cernan was born on March 14, 1934 in Chicago, Illinois, the son of Andrew and Rose Cernan (she lived to see him walk on the moon). After high school he studied at Purdue University and accepted a partial ROTC scholarship in the Navy that required that he serve on the USS *Roanoke* between his junior and senior years. He graduated with a BS in Electrical Engineering in 1956.

He was commissioned as a Navy Ensign through the Naval Reserve, then changed to active duty and attended flying training at various Naval Air Stations. He was certified as a naval aviator, flying the FJ-4 Fury and A-4 Skyhawk jets. He obtained a Master Degree in aeronautical engineering from the Naval Postgraduate School. During his naval career, Cernan logged more than 5,000 hours of flying time and performed more than 200 successful carrier landings.

Cernan applied for and was selected for the third group of astronauts by NASA in October, 1963. Cernan and Thomas Stafford were selected as the backup crew for Gemini IX. The primary crew, Elliot See and Charles Bassett, were killed in a crash of their T-38A at Lambert Field in Missouri on February 28, 1966. Stafford and Cernan moved up to primary crew. The target Agena upper stage for their mission was destroyed in an explosion during the Atlas launch. An augmented targeting adapter was hurriedly assembled and launched on another Atlas and the Gemini mission was renamed Gemini IX-A. The mission finally launched on June 3, 1966 and the crew was unsuccessful in docking with the targeting adapter but Cernan did have a two-hour EVA that was only partially successful using a balky maneuvering unit.

Cernan was selected as the backup LM pilot for Apollo 7 (no LM carried on that mission) and then became the primary LM Pilot for Apollo 10, the final dress rehearsal for the Apollo 11 mission. Cernan was teamed with Tom Stafford again and John Young on this mission; he and Stafford flew to within 8.5 nautical miles of the lunar surface. This mission was profiled in a MARS STAR in 2019.
Cernan turned down the LM Pilot position on Apollo 16 to be Commander of Apollo 17, the mission profiled in this History Corner. After Apollo, Cernan retired from the Navy in 1976 with the rank of Captain and went into private business. He was an expert commentator on the ABC network for the first three shuttle missions. He also contributed content to ABC News and *Good Morning, America*. He published his memoir in 1999 (The Last Man on the Moon). Cernan and Armstrong testified against cancellation of the Constellation program and he was a skeptic of companies like SpaceX until he saw their continued successes. He was married twice and had one daughter Tracy with his first wife Barbara Jean Atchley. He traced Tracy's name into the lunar dust during the last EVA. His second wife, Janis Ellen Jones, whom he married in 1987, had two daughters from a previous marriage and she survived him at his death. Cernan passed away from various health issues on January 16, 2017 at the age of 82. Cernan garnered many service honors and medals during his life and is in the Astronaut Hall of Fame. The Cygnus CRS OA-8E Cargo Delivery Spacecraft launched on November 12, 2017 was named in his honor.

Harrison H. "Jack" Schmitt, Jr. Biography

Schmitt was born on July 3, 1935 in Santa Rita, New Mexico and grew up in Silver City. He received a BS degree in geology from the California Institute of

Technology in 1957, was Fulbright Scholar in Norway and earned a PH. D in geology from Harvard in 1964.

Before joining NASA as a member of the first group of astronaut-scientists selected in June 1965, Schmitt worked at the US Geological Survey's astrogeology center in Flagstaff, Arizona. After selection, he learned to become a jet pilot and spent time at Houston training Apollo crews on what they could observe on the lunar surface. He was selected for the backup crew for Apollo 15 with Vance Brand and Richard Gordon, having become proficient in CM and LM systems. He was assigned to Apollo 17 after the cancellation of Apollo 18 and 19, replacing Joe Engle.

After returning from the moon, Schmitt resigned from NASA in 1975 and was the Republican nominee for US Senator from the State of New Mexico in 1976. He defeated the incumbent, Joseph Montoya (a Democrat). He only served one term and was the chairman of the Science, Technology and Space Subcommittee. He was defeated in 1982. Since that short political career, Schmitt has worked as a professor of Engineering Physics at the University of Wisconsin and also consulted and worked in public policy. He was the chair of the NASA Advisory Council from 2005-2008. He is an enthusiastic advocate of lunar exploration and mining and currently lives in Silver City, New Mexico. (He is 87 as of this writing in December, 2022). Schmitt never married. We saw a great lecture by him at the Apollopalooza event at Wings over the Rockies in 2019 for the 50th anniversary of the Apollo 11 landing. Schmitt has had numerous honors and awards and is in the Astronaut Hall of Fame.

Ronald E. (Ellwin) Evans, Jr. Biography

Evans was born on November 10, 1933 in St. Francis, Kansas. His family moved to Topeka during his high school days because one of his brothers had liver cancer (passed away in 1951). Another brother of Evans played football for the Denver Broncos (Jay Evans). Ron Evans decided to attend the University of Kansas to major in Electrical Engineering, securing a NROTC scholarship from the Navy. He graduated with that degree in June, 1956.

Evans wanted to pursue a career in naval aviation and was commissioned as an ensign. He was assigned to several Naval Air Stations, learning various flight systems. He became a fighter pilot based at NAS Miramar, flying FJ-3 Furies and the new F8U Crusader. He married Janet Pollom from Topeka in December, 1957; they had two children and were married until his death. Returning to his flying duties, he became a flight instructor.

Evans first applied to NASA in 1963, along with fellow classmate at the Naval Postgraduate School Gene Cernan. He passed several obstacles, but was informed that he was turned down in October, 1963. He continued his studies and graduated with a Master of Science degree in aeronautical engineering. Evans moved on to sea duty on the USS *Ticonderoga* (ironically, the recovery ship for the Apollo 17 mission). He flew combat missions over Vietnam during this time. In 1965, NASA announced the opportunity for more pilot astronauts and Evans re-applied. He was accepted in the class that was announced in April, 1966, but before he reported for duty, he was awarded the Navy Commendation Medal for attacks on Viet Cong units and flew more sorties in support of that war.

After reporting to NASA, Evans became a CSM specialist. He was on the support crew for the Apollo 1 mission and worked inside the Apollo 1 spacecraft for a few hours before the fatal fire. Evans also served on the support crews for Apollo 7 and was a CAPCOM for Apollo 7, Apollo 11 and Apollo 14. Through a series of events and reassignments, he was chosen by Cernan as the backup CMP for the Apollo 14, leading ultimately to the prime crew assignment for Apollo 17.

After Apollo 17, Evans was promoted to Captain in the Navy and served as the backup CMP for the Apollo-Soyuz Test Project. He retired from NASA in 1977 and he and his wife moved to Scottsdale, Arizona to be near her parents. He worked for various companies and as a consultant. He died unexpectedly in his sleep from a heart attack on April 7, 1990. Evans received numerous commendations and awards for his naval and NASA service and is in the Astronaut Hall of Fame.

Resources and Links

Apollo Flight Journal: https://history.nasa.gov/afj/

Apollo Lunar Surface Journal:
https://www.hq.nasa.gov/alsj/a17/a17.html

Apollo 17 Mission Summary:
https://solarsystem.nasa.gov/missions/apollo-17/in-depth/

Wikipedia: Astronaut Biographies, general overviews of the mission:
https://en.wikipedia.org/wiki/Apollo_17

Next Edition

In the next MARS STAR, I will begin a series on Skylab, looking at the design and deployment of the lab itself (Skylab launch on the last Saturn V) and the first crew (Skylab 2). See my announcement for how you can participate in the stories of Skylab later in 2023.

Errata: In the last Program Profile for the Titan/Cassini mission, the Titan Centaur upper stage was misidentified as TC-20. The Centaur vehicle was TC-21.

Contact me at barbsande@comcast.net or 303-887-8511 or find MARS Associates on Facebook.

Bridge Club

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

Come play bridge with us! It is social, not tournament bridge, with light conversation while we play. All MARS members and their guests are welcome. With a few exceptions, we play on the **3rd Friday of each month at the Buck Community Recreation Center in Littleton from 10 AM to 2 PM.** The next quarter, we are scheduled to play on 20 January, 17 February, & 17 March 2023.

You'll need to pack a lunch, as we stop midday to eat and then resume playing. The club provides the cards and all required items for the games. The fee for the Buck Center increases on 1 January to $2.00 for in-District and $3.00 for out-of-District. There is also a small fee to the club (which helps with supplies and the year-end Holiday party).

In November, we celebrated the holidays with our annual potluck lunch. It was kindly hosted by Bill and Mavis Kacena. Everyone had a great time and fun at bridge.

Come and join us by calling at least a week ahead to reserve a place at the tables.

This quarter we welcomed our newest players, **Terry & Mary Roberts.** There is still room for more players, as the room will accommodate 8 tables.

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

If you want to join us for bridge, or 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

The 4th Quarter 2022 winners are as follows:

21 October (6 tables)
N-S 1st – Bill Kacena & Bill Pereboom
2nd – Terry & Mary Roberts
E-W 1st – Mark Ugale & Bob Dawson
2nd – Curt & Phyllis Brudos

18 November (5 tables)
N-S 1st – George & MJ Eger
2nd – Ernie & Cecile Berliner
E-W 1st – Terry & Mary Roberts
2nd – Bill & Mavis Kacena

16 December (5 tables)
N-S 1st – Ed & Laurie Bock
2nd – Dave & Kathy Martz
E-W 1st – Betty Hirst & Wayne Jackson
2nd – Bill & Mavis Kacena

Car Club

By Roger Rieger
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303-912-6217

Carol Lovelace
(cyberbear51@comcast.net)
303-358-7459

Greetings and Happy New Year MARS members and fellow Car Clubbers! By the time this is published, we will be well into the new year, hopefully planning for all the fun adventures to be had in 2023!

With the advent of colder weather and cruddy roads here in Colorado, the club is in our annual winter slumber. Occasionally the weather will surprise us with a nice day and I do my best to take advantage of them and take the red car out for a spin -- hope you are able to do the same. The rest of the time, she sits in the garage and gets dusty.

The club was represented at the MARS Holiday celebration, and as is our tradition we were able to provide the Marine Corp. Toys for Tots program a nice donation from the proceeds of our September show. Thank you to everyone who participated and donated to this worthy cause!

As we await warmer weather and better roads, keep your eye open for communications via this newsletter, the MARS Associates Car club Facebook and webpages. In the March/April timeframe we will announce a Car Club kick off meeting to discuss possible Club events and solicit volunteers for the 2023 Club year.

Stay in touch with the Car Club through our MARS Car Club Facebook page, MARS Associates website link, or by contacting either Carol or myself to get added to our email distribution. There is nothing special you need to do to join the MARS Car Club, all it takes is to be a MARS member in good standing, and a desire to have

fun! If you are interested in joining the club, please drop either Carol or myself an email, we'd love to have you!

Dinner Club

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

Our last event for the Dining Club was at Maggiano's in Englewood on Halloween. Even though there were not a lot of guests at the lunch, we all had a very good time with great food and great people.

This was the last event for the Dining Club since no one has stepped up to take on the task of obtaining and scheduling events starting in 2023. The current plan is to move any money left in the club's bank account to the MARS account and kept for up to 6 months while replacement(s) for us are pursued. If, at that point in time, no replacement(s) have been found, we plan on donating the money to at least a couple of charities. We will discuss ideas with several of the Dining Club members to get a feel for where the money should be donated.

If anyone is interested in helping keep the Dining Club going, please contact us. We will be more than willing to describe what is needed to keep the club going.

Golf League

Sandy Mossman
(smoss5592@gmail.com)

Happy New Year to all! May the New Year bring you many pleasurable moments on the golf course.

It is hard to believe the 2023 MARS Golf League season is just around the corner and our committee is underway in planning our "kick-off" meeting to commence the new season. Each year, we attempt to increase our golf league membership by encouraging MARS Associate members - **both men and women** - to join. In 2022 we added several new men and women members and want to continue the trend in 2023.

Our golf league invites you to participate in our spring/summer/fall golf league which plays on Thursday mornings, April through October. Our league play is exclusively at Englewood's Broken Tee Golf Course with first tee time between 8:30 and 9:00, depending on the time of the year. Our primary purpose as a club is to realize a pleasurable golfing experience by promoting social interaction and friendly competition using the certified USGA handicap system. We will be having our annual "Kick-Off" golf meeting on Thursday, March 9, 2023 at the Broken Tee Golf Course grill (2101 W. Oxford Ave.) at 10:00 A.M. We encourage you to attend this meeting as we will review our league's order of business, the rules of golf imposed by the USGA and basically how the league 'works'. However, if you cannot attend the kickoff meeting, please, contact Tom Ripper or myself for more information and/or to sign-up.

Tom Ripper - tomripper303@gmail.com
Sandy Mossman - smoss5592@gmail.com

See the attached flier in the MARS Star for more information.

Broken Tee Golf Course is an 18-hole championship course with some tight fairways and some small lakes to challenge the average golfer. It offers affordable golf rates (for 18 holes, age 62+ non-resident $28 green fee, age -62 non-resident $35green fee), which is hard to beat in the region. If you choose to ride, golf carts are $19 per player. The great thing about our league, is that there aren't any up-front green fees; you only pay when you play. Come join us this season for fun and exercise!

If you have any questions regarding our golf league, please feel free to view our MARS website: www.marsretirees.org and click on "Golf" or contact me if you like at: (303)730-8378.

Hiking Club

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

On a bright and crisp November morning, seven MARS members enjoyed a hike on the Mesa Trail. The trailhead is at the NCAR headquarters in Boulder. The trail quickly climbs to the base of the Flatirons and then meanders through meadows and forest. The dusting of snow on the rock formations helped us appreciate the beauty to the west of Boulder.

The approach to Mesa Trail from NCAR.

Hikers at Mesa Trail: Don Foley, Ken Marts, Norman Luepschen, Mark Nash, Robin Zen, Lee Janssen.(photo by Sue Janssen)

Although the trail was covered with snow we tromped along on sure feet while a few hardy runners sped by. At our turn-around point, several of us climbed onto sunny boulders to admire the expansive view to the east.

Photography Club

By John Chapter
johnchapter@msn.com
303-986-8277

The MARS-Photo Club is active during January, February, March, April, May but we are not active from June, July, August 2022 as this is our summer break. We resume activities September, October, and November however in December 2022, we had a *Holiday-Luncheon* at Café Jordano located at Jewel and Kipling in Lakewood.

- Our normal meeting uses the standard and popular *Zoom format* for the meeting and members attend online. We generally begin with a *Photography contest.* Interested Members may enter two images of their choice. A judge, generally a selected club member, critiques the image and selects first, second, and third place, followed by an honorable mention. The winning images are displayed on our Photo-Club webpage. Following the Photo-Contest, we have a presentation from a club member and/or we may present a professional program from a DVD made by *National Geographic.*

Lockheed Martin Retirees may join the Photo-Club at any time and membership is free.
Several selected photography club photo-club winners are presented below. Remember that all the winning images are shown on the MARS club website for the year of 2022. You are encouraged to view the images online.

November 2022

Portrait of an Orchid, by BJ Anthony, First Place

October 2022

Maroon Lake by Tom Frickell, First Place

The Photo-Club has been experimenting with providing a live *Zoom* meeting from the *Columbine Library.* This approach allows Photo-Club members to attend our meetings or stay at home. We have tried several times with this approach, but have had low support from the club (about four or five members); therefore, we have decided to maintain the online *Zoom* approach for the foreseeable future. Members are sent emails giving them all the information necessary to attend the *Zoom* meetings. Our Photo-Club *Zoom* meetings are usually at 1-pm on Thursdays. Members choose if they would like to attend.

Please remember that all the winning images and other information are available online and members are recommended to view them on ***MARSRetirees.0rg.***

John Chapter, Club President and Jim Kummer, Vice President

Colorado Springs Lockheed Martin Retiree Group News

By Doug Tomerlin
(dougincs@aol.com)

The Colorado Springs Lockheed Martin Retiree Group held a luncheon on October 6, 2022 at Cheddars Scratch Kitchen. Attendance was good; however, we had fewer retirees attending than at the last several luncheons. Dick Sosnay, MARS Associates President, and Ken Marts, MARS President Elect, attended the luncheon. They briefed the group, addressing the benefits of Colorado Springs retirees joining MARS Associates and discussing planned group activities.

We are sad to hear that three Colorado Springs Lockheed Martin retirees passed away since the last newsletter. Our deepest condolences go to their family and friends.

- Harry Riley passed: November 26, 2022
- Dave Cruickshank: December 1, 2022
- Lyle Ladefoged: December 12, 2022

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

- Jeanine Martinez
- Theresa "TJ" Johnson

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

Cape Canaveral News

By Dick Olson
(olsons5145@aol.com)

Luncheons

November 2022 – Another really light turnout this month. Present were Wendell McDaniels, Abe Smith, Roger Wright, Bob Matschner, Ken Webb, Don Bollinger and Cecil Snipes. Roger reported that Lynn Johnson has fallen again and is in the hospital. We wish her a speedy recovery.

We hope everyone had their fill of Halloween candy and wish you all a happy Thanksgiving.

December 2022 -- Another small turnout but lots of catching up. Attending were regulars Wendell McDaniels, Laverne Jones, Don Bollinger, Cecil Snipes, and Bob Matschner. Also joining us were Jerry Teague and his daughter Amy and Don Fleming down from Denver.

Don is visiting his son and will be around for a while as he is having some work done on his eyes while he is here. Hope to see him again next month.

Jerry, who recently lost his wife, is remodeling a house he owns near his daughter's place and hopefully will be joining us on a regular basis.

I would like to wish everyone a Merry Christmas and a Happy New Year. Stay safe during the holiday season.

January 2023 -- Another small turnout again this month -- maybe this is the new norm. Present were Wendell McDaniels, Abe Smith, Lynn Johnson, Ken Webb, Roger Wright, Don Bollinger and Lavern Jones. Sounded like everyone had a pretty quiet New Year's eve. I know I didn't make it to see the ball drop.

Don reported that Ralph Graves had fallen but was back home and getting better and that Ray Caldwell was still alive and kicking.

Missing on the list of those who passed last year was Marvin Davis.

The new year is upon us and hopefully it will be better than last year. Stay healthy,

Recent Obituaries

Leroy Wright, 90, passed away on October 22, 2022. Leroy headed up the Publications Dept. for many years and was responsible editing, updating, and printing our test procedures as well as all other documents printed at the Cape. He was also an avid bass fisherman and protector of the Saint John's Waterway and even published a book on the subject.

REMEMBERING -- I hope you all had a Merry Christmas and wish you all a Happy New Year. Things will get better. I would like to take a moment to reflect on the Cape Titan Team members that we lost this past year. No longer with us are: Joe Andrukeitis, Richard Rogers, Bob Lantau, Fred Hudoff, Dick Gentile, Ray Hall, Russel Batchelor, Edith Henderson Berkebile, Don Seib, Norm Fox, Dave Ballou, Bill Trudeau, Bill Masterson, Terry Tolbert, Bill Rhode, Ron Frisbee, Marvin Davis, and Leroy Wright. They will be missed

Lockheed Martin (LM) News

InSight's Mission Team Shares Its Best Moments as Mars Spacecraft Retires

On Nov. 26, 2018, NASA's Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (InSight) mission touched down on the surface of Mars. Designed and built by Lockheed Martin, the Mars lander continued performing well past its intended two-year mission, finally retiring in December 2022.

Here are some of InSight's best mission moments – and the *insights* these moments gave us into Mars' inner workings – as told by those who worked on the mission for many years.

Where it all began: surviving the seven minutes of terror – In order to even make it to Mars' surface in 2018 to do all its cool science, InSight had to perform a harrowing entry, descent and landing sequence famously known as the 'seven minutes of terror' for its technical complexity and because signal delays preclude humans from interfering if something goes wrong. Not only did InSight survive, but it returned one of the coolest first photos ever (and yes, it made us tear up).

> *"After all the time I've spent working on this mission, it's hard to narrow down one favorite moment, but I guess it would have to be the moment we confirmed safe touchdown on Mars. It was only then that I knew that all the heart and soul (and time!) I had put into InSight over the years was really going to pay off. No matter what happened after that, we were safely on Mars, and we were going to do what we had been dreaming of and planning for years."*

The first ever detection of a marsquake – In April 2019, after months of hearing only wind and surface noises, InSight became the first spacecraft to measure a marsquake. During its mission, InSight recorded 1,300+ seismic events, some at magnitudes greater than 4. These marsquakes detected by InSight are helping scientists understand how Mars and other rocky planets (like Earth) formed.

> *"Dec. 25, 2021, Marsquake. What an amazing Christmas present."*

Observing eclipses from Phobos and Deimos (Mars' moons) – In addition to observing plenty of Martian weather phenomenon, data from InSight's solar arrays was precise enough to observe the eclipse of both of Mars' moons! Dips in the lander's energy corresponded with each moon passing overhead.

> *"With how sensitive InSight's instruments are, we could notice a dip in the solar array current and in our temperature sensors on the outside of the spacecraft because of these celestial bodies passing overhead. As a thermal engineer, seeing our environmental temperatures dip from these eclipses was a favorite moment of mine."*

Discovery of Mars' molten core – InSight was the first Mars spacecraft to give us glimpses into the planet's interior composition. InSight's data confirmed that Mars' core is molten and helped scientists measure its size (1,120 miles, or about 1,800 kilometers in radius). Learning about Mars' core in turn helps us understand the planet's formation.

> *"The science of InSight is a slow burn. We learn about the interior by bootstrapping from the new interpretation of one quake, or family of quakes, to the next. Slowly we are learning to read the language of marsquakes to paint a more precise picture of the interior."*

The largest meteor impact ever witnessed on Mars – In December 2021, InSight witnessed a magnitude 4 marsquake that images from the Mars Reconnaissance Orbiter confirmed was caused by a meteoroid strike near Mars' equator. The quake – one of the biggest meteoroid strikes witnessed on Mars – pushed ice chunks in Mars's crust to the surface. The presence of ice so close to the Martian equator bodes well for human travel to Mars, as astronauts can take advantage of finding and using ice while living in one of

the warmest parts of the planet. Talk about *impactful* work!

Clearing dust with…dirt? – With time, dust settled on InSight's solar arrays as expected, slowly draining the lander's power. The team tossed around several ideas for cleaning the dust off – restarting the descent engines to kick up dust, or somehow shaking out the arrays – before landing on something unconventional: using Mars dirt. Engineers leveraged the lander's arm to scoop dirt onto the solar arrays. Angling the scoops in precisely the right way allowed the team to use the wind to their advantage, resulting in the larger chunks of dirt catching and clearing away the dust.

> *"My biggest personal surprise was when I looked at telemetry, and it showed that the dust dump actually worked. It was a Saturday, but I immediately drafted an email to the team and titled it something like, 'Wow, it actually worked' and showed a plot of the solar array telemetry with an instantaneous boost in array performance – lining up exactly with the timing of the dump of dirt."*

A new safe mode tech crucial for survival – While previous landers like NASA's Lockheed Martin-built Phoenix lander only monitored energy levels via its batteries, InSight was engineered with a landed modeled energy feature that measures energy levels via its batteries and its solar panels. This new fault protection feature helped InSight survive several dust storms throughout its mission by detecting darkening skies and low energy levels faster – and then initiating safe mode.

> *"In January 2022, InSight experienced an intense dust storm that activated this special feature. This storm was so much more severe than the previous things we'd seen, and – while it was a contingency situation – seeing the safeguard work exactly like it was supposed to was exciting and rewarding."*

Rest easy, InSight!

From our planet to yours: thank you.

11 Things You May Not Have Known about Orion

Space fans may know that Orion is the only human-rated spacecraft designed for travel to deep space, and not only will it return humans to the Moon, but it may even get them to Mars. But how well do you really know Orion? Here are 11 little known facts about the spacecraft that's about to make history.

1. There's an exercise machine inside Orion and it's similar to a rowing machine

The compact flywheel exercise machine is used for aerobic and strength workouts, and works similar to a rowing machine. All four astronauts have to exercise every day (except launch and landing days) to keep from losing bone mass. In order to exercise comfortably and efficiently, the machine will be placed on a 45 degree angle.

2. The energy dispersed by Orion's heat shield during re-entry is about the same amount of energy of an EF3 tornado

The energy exuded by Orion's heat shield as it comes back into Earth's atmosphere is approximately 640 gigajoules. This amount of energy dispersed is about two times the amount of energy created by a spacecraft returning from the International Space Station.

3. Orion's heat shield will get up to 5,000°F during re-entry, yet the inside will stay comfortable in the 70s.

The primary way Orion puts on its breaks before it splashes down is with its heatshield. As it screams through Earth's atmosphere, friction and air resistance causes extreme temperatures on the heat shield reaching about 5,000°F during re-entry. These high temperatures are about 2.5x the temperature of Hawaiian lava and 66% hotter than spacecraft coming back from the International Space Station.

4. Returning from the Moon, Orion will go 24x faster than a speeding bullet

Orion will return to Earth from the Moon at a speed of about 24,600 mph or about 7,600 mph faster than a spacecraft coming back from the International Space Station. At this speed, Orion could travel from Los Angeles to New York City in 6 minutes, while a normal flight on commercial airlines takes 5.5 hours.

5. Orion will travel 1000x farther into space than the International Space Station

The International Space Station orbits 240 miles above the Earth and the Moon is 240,000 miles away, so Orion will takes astronauts 1000x farther into deep space than the ISS. And once there Orion will travel an additional 40,000 miles past the Moon during the uncrewed Artemis I uncrewed mission.

6. There are 11 parachutes to slow down Orion in the Earth's atmosphere and safely land on the ocean

After Orion's heat shield scrubs off most of the Orion's speed, the parachute system with its 11 parachutes will slow the crew module during the last part of re-entry from 324 mph to 17 mph for a soft ocean splashdown. Orion uses is three main parachutes to land, though it can land safely using only two. All three main parachutes combined would cover a football field from 10 yard line to 10 yard line.

7. The crew systems in Orion are designed to accommodate 99% of the human population by size.

Orion is designed to accommodate 99% of the human population, which is a larger range than every other NASA or Department of Defense project. The spacecraft can accommodate astronauts as small as a 4'10" and as tall as a 6'5".

8. During the Artemis I mission, Orion went about 40,000 miles past the Moon

As Orion orbited around the Moon, it went out about 40,000 miles beyond, which is about 15 times the distance from Maine to San Diego and about 30,000 miles farther than Apollo traveled. At its closes point, Orion was about 62 miles above the surface of the Moon.

9. The computers on Orion are 20,000x faster than Apollo's

Orion's main computers provides significantly faster computing speed over other human spaceflight vehicles. The computing speed of each computer is about 25 times faster than the International Space Station's computers, 400 times faster than the space shuttle's and have four independent computers running in parallel for redundancy.

10. Orion's crew module is rather roomy, sleeps four comfortably and has a private toilet

At 315 cubic feet, Orion's crew module provides 30 percent more cubic volume of space than the Apollo capsule. The seats inside of the crew module fold down and create a lot of room for the four astronauts to live in for up to three weeks. It even has a private toilet, or "hygiene bay," about the size of one on a small passenger airplane.

11. Orion can operate in deep space for a long time

Orion has room for supplies and consumables to safely sustain a crew of four for up to 21 days. It can function unattended for six months in orbit when docked to the Gateway at the Moon. Orion has also been evaluated to support a 1,000 day mission to Mars when equipped with additional propulsion, habitats and supplies as part of a larger Mars transport system.

United Launch Alliance (ULA) News

United Launch Alliance Enables Advanced Weather Forecasting with Launch of Climate Monitoring Satellite for NOAA and NASA

Secondary experimental payload marks key milestone for future reusability

Vandenberg Space Force Base, Calif., (Nov. 10, 2022) – A United Launch Alliance (ULA) Atlas V rocket carrying the Joint Polar Satellite System (JPSS)-2 mission for the National Oceanic and Atmospheric Administration (NOAA) and National Aeronautics and Space Administration (NASA) and NASA's Low-Earth Orbit Flight Test of an Inflatable Decelerator (LOFTID) lifted off on Nov. 10 at 1:49 a.m. PST from Space Launch Complex-3 at Vandenberg Space Force Base.

"We depend on accuracy and timeliness of weather prediction models for enhanced weather forecasting and climate observations. Our ULA team is proud to launch the JPSS-2 mission that supports advanced forecasting of extreme weather and global climate monitoring," said Gary Wentz, ULA vice president of Government and Commercial Programs. "Additionally, we look forward to reviewing the data collected from LOFTID as we explore Hypersonic Inflatable Aerodynamic Decelerator (HIAD) technology for engine reusability on our future Vulcan rocket. Successfully deploying these two payloads is a monumental achievement; thank you to our mission partners for their outstanding teamwork."

The Atlas V rocket delivered the JPSS-2 spacecraft to a sun-synchronous low-Earth orbit. After delivering the JPSS-2 spacecraft, subsequent burns by the Centaur upper stage lowered the altitude to a re-entry trajectory to deploy the LOFTID experiment. Once separated, LOFTID reentered Earth's atmosphere, deployed its parachute and landed off the coast of Hawaii. This experiment demonstrates how an inflatable aeroshell, or heat shield, could deliver heavy payloads safely through the atmosphere to the surface of Earth and potentially other planets.

Photos available on the ULA Flickr page.

MARS ASSOCIATES

2023 MEMBERSHIP RENEWAL (DUES) NOTICE

It is time for **all** regular and senior members to renew your membership for the year March 1, 2023 — February 29, 2024, regardless of which month you joined MARS Associates.
Please complete the Membership Renewal Form below and mail with a check or money order made out to "**MARS ASSOCIATES**" in the amount shown below, to be received not later than March 31, 2023.
Members whose dues are not paid as of March 31, 2023, will be notified and will be dropped from membership if dues remain unpaid. Membership expiration is determined by Membership Database records. Members who have been dropped will not be eligible for MARS clubs or member discounts for activities or benefits after March 31.
Retain your current membership card–cards are not reissued annually. More information about MARS is on the back of this page. If you have questions, contact the Membership Vice President, Carl Kaminski, at **CARLKCOL66@GMAIL.COM** or 303-726-1546.

Please complete all the blanks – The treasurer separates checks from the form upon receipt!
----- ----- ----- ----- ----- ----- CUT AT DASHED LINE ----- ----- -----

Membership Renewal Form

Mail to: **MARS ASSOCIATES, PO Box 1128, Littleton, CO 80160-1128**
(New members must complete and submit the New Members MARS Membership Application form found on the website (MARSRETIREES.ORG → MEMBERSHIP) or contact Carl at **CARLKCOL66@GMAIL.COM**)

Membership dues for FY2023 are as follows: **(Please check appropriate box.)**

Current Regular Member residing in Colorado **all or part** of the year. $25.00 ·

Current Regular Member residing full-time outside Colorado. $15.00 ·

Current Senior Member (or surviving spouse) whether residing in Colorado or out of state, whose retiree-member birthdate is earlier than March 1, 1948. $15.00 ·

Check # _____ Check Date _____

Please confirm your membership information or indicate 'No Change'

Name(s) _____
First MI Last Nickname

Spouse (or significant other) _____
First MI Last Nickname

Address _____ Apt/Unit _____

City/State _____ Zip _____ Zip ext._____

Phone _____ Email Address _____

Spouse Email Address (Optional) _____

Do you want your email address listed on the MARS website? YES · NO ·

Do you want to receive special notices from MARS by email? YES · NO ·

Are you interested in volunteering in support of MARS? YES · NO ·

If you volunteer for another organization, let us know where: _____

Snowbirds:

Please notify the Membership Vice President by telephone, email or "snail mail" when you know your travel dates to your alternate address AND what that address is.

MARS STARs are mailed by Standard (Bulk) Mail to keep the cost of mailing low—every rejected or forwarded MARS STAR incurs an additional postage cost to MARS Associates.

Membership

- **Low annual membership dues** - $25.00 in-Colorado, $15.00 out-of-Colorado and seniors (≥ 75 years of age); includes you and your spouse or significant other
- **Dental, Vision** at very reasonable rates
- **Vendor Discounts** – visit our website (http://www.marsretirees.org)
- **Social Events** – annual picnic, happy hours, luncheons, Rockies games, etc.
- **MARS STAR Quarterly Newsletter** – information on past and current events relating to the organization as well as Corporate, LMSSC and ULA happenings
- **Informational & Educational Presentations** – periodic seminars on topics of interest (e.g. Medicare 101)
- **Connectivity with other retirement associations throughout the corporation**

Volunteer Opportunities

- **Community Service & Event Support** – help your community and/or the companies with the MARS team, for example, the Fun Run, Health Fair, Community Support Programs
- **MARS Support** – Web Committee, In Memoriam, Event Photographer
- **MARS Leadership** – Board of Directors and Officer positions of leadership, maximum of two 2-year terms (see the Bylaws and Policy Manual posted on the MARS website)

Current Club Activities

- **Bridge Club** – lively party bridge, singles welcome
- **Car Club** - Invites all car enthusiasts to become members, meet other like-minded people, and enjoy and share our love for the automobile.
- **Golf League** – a handicap league open to men and women that plays weekly games throughout the summer with a tournament in September and a banquet in the Fall
- **Hiking Club** – planned hikes for various levels of ability
- **Photography Club** – monthly meetings at Littleton Bemis Library (*except June, July, August*), photo-related presentations and programs – including travelogues, photo contests, help with equipment and photography; open to everyone.
- **Special Interests** – You are encouraged to start a club for your special interest There is something for everyone to enjoy and all activities are open to all members. Come check us out on our website at http://www.marsretirees.org for more information.

- MARS ASSOCIATES IS A REGISTERED 501(c) (7) SOCIAL AND RECREATION CLUB

MARS SPRING EVENT & ANNUAL MEETING

The Officers and Board of Directors of MARS Associates are pleased to invite you, your spouse/companion and guests to the MARS Spring Event and Annual Meeting on **Wednesday, March 1, 2023** at the **Arrowhead Golf Club** located at **10850 Sundown Trail, Littleton, CO 80125**. Directions to Arrowhead are on the back of this flyer or you can ***Ctrl + Click (or click if you are using a mouse) on the address above to create a map from your* location.**

The event is a different format from March Luncheon/Annual Meetings in the past. This year it will be an afternoon event starting at 1:00 p.m. with a buffet of hors d'oeurves and a cash bar. There will be a guest speaker from ULA, status of MARS Associates and its clubs, and a look ahead at 2023 special events. We are still looking for input or feedback to continue to improve on your experience. Feel free to reach out to any Board Member for that communication.

1:00 to 1:30 gather and get a drink and some munchies
1:30 to 2:30 Guest Speaker
2:30 to 3:00 More hors d'oeuvres and drinks
3:00 to 3:30 Club presentations
3:30 to 4:00 wrap up

The cost for members and one guest is $25.00 per person. The cost for additional guests or non-members is $40.00 per person. These prices include hors d'oeurves, taxes, gratuities and cost of the venue. Please complete the form below and mail it with your check (made payable to **MARS Associates**) to the address on the form by **February 17, 2023**. Or, you can make your reservation by using the STRIPE link below:

STRIPE (ctrl+click): (https://form.jotform.com/223637799026063)

MARS Associates, P.O. Box 1128, Littleton, CO 80160-1128

All reservations and cancellations must be received by **February 17, 2023**. If you make a reservation and later find you cannot attend, please notify, Linda Duby at 303-249-1665 or lindaduby@comcast.net, or Charlie Haupt at 303-725-7595 or qcrfccoach@gmail.com or Carl Kaminski at 303-726-1546 or carlkcol66@gmail.com no later than **February 17, 2023** to receive a refund. Admission is by reservation only.

----------Detach Here----------

2023 MARS Spring Event and Annual Meeting Reservation Form Please Print Clearly.

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

Member: _____

One Spouse/Companion/Guest: _____

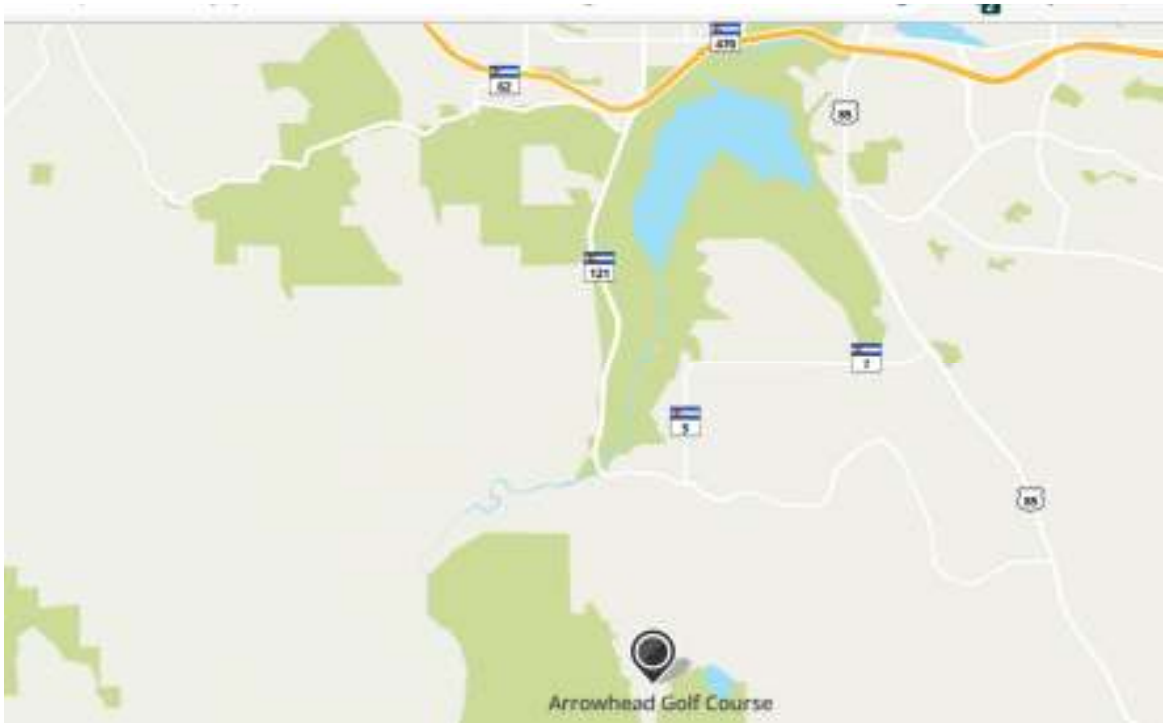
Other Guests: _____
(Add sheet for additional guest names) Member Phone No. _____

Member e-mail address _____

Member/Spouse/Companion/Guest ___@ $25.00/person = $ _____
Other Guest ___@ $40.00/person = $ _____

TOTAL ENCLOSED $ _____ Check # _____

Directions to Arrowhead Golf Club: From C-470 take CO-121/South Wadsworth Boulevard south to Waterton Road, turn left. Go 1.6 miles and turn right onto North Rampart Range Road for 2.2 miles. Continue straight onto Roxborough Drive for .3 miles. Turn left onto Sundown Trail for .2 miles then turn left into the entrance of Arrowhead.



MARS ASSOCIATES GOLF

Men & Women Members Included

League plays every Thursday,
April thru October

- ✓ **Weekly Prize Money**
  - **Closest To the Pin**
  - **Low Net Winners per Flight(s)**
- ✓ **Certified USGA Handicap System**
  - **CGA Membership**
  - **Annual Golf Registration, Club and User Fees - $80.00**
- ✓ **End of Season Most Improved Player**
- ✓ **Pay As You Play (Regular Weekly Green Fees +$5 Prize Money)**
- ✓ **Annual Championship Tournament**
  - **Pays Low Net Winners**
  - **Medalist Trophy to Low Gross Player**

Kick-off Meeting on Thursday, 9 March @ 10 A.M.

ENGLEWOOD'S BROKEN TEE GOLF COURSE
2101 West Oxford Ave
Englewood, Colorado

Contact: Sandy Mossman
. Golf League President
Smoss5592@gmail.com

To learn more go to www.marsretirees.org **and click on "Golf"**

in the clubs listing section

IN THE NEWS
Compiled by Pete Harrigan

The following news headlines are drawn from open-source publications, as noted parenthetically. Click on the hyperlink to access the full article. Please note that some links may not work for all readers. Some sites may require a paid subscription or a login for free access. Other paywall sites may limit the number of free articles you are able to access each month.

CORPORATE NEWS

Lockheed Martin (LM) beats third-quarter estimates on F-35 sales, maintains guidance as supply chain challenges remain (Reuters)
LM sees flattish 2023 sales due to uncertainty, supply issues (Aviation Week Network)
New LM office seeks partnerships with mid-size firms (Defense One)
LM, IBM Red Hat team up to speed AI development for Pentagon (Defense News)
LM gets Microsoft classified cloud to speed work with Pentagon (Reuters)
LM ups stake in Terran Orbital, invests $100 million to expand smallsat manufacturing (Space News)
Terran Orbital sees staff departures as it turns focus to military satellites (Space News)
In an age of innovation, big defense may be the closest thing Washington has to a real industrial policy (Forbes)
Military spending surges, creating new boom for arms makers (The New York Times)
LM shares gain most since 2020 on profit beat, buyback plan (Bloomberg News)
Largest defense firms donate millions to election-denying lawmakers (Defense News)
White House revamps membership of National Space Council advisory group; Taiclet retains seat (Space News)
LM declares fourth quarter 2022 dividend (Company news release)
Forbes lists LM as one of "world's best employers" (Camden News)
Labor shortage still pinching aerospace and defense sector (Defense News)
Will tech layoffs finally help defense firms get the engineers they seek? (Defense One)
LM closes its doors in Marion, MA (Sippican Week)
"No weapons sales to Israel." How a "tweet" resulted in a loss of billions of dollars to U.S. defense giant (The EurAsian Times)
Air Force defeats Baylor 30-15 in Lockheed Martin Armed Forces Bowl (Colorado Springs Gazette)
Experts forecast smooth path for L3Harris acquisition of Aerojet Rocketdyne after LM deal blocked (Defense News)

HYPERSONICS NEWS

U.S. Air Force successfully tests first fully-operational air-launched hypersonic missile (Breaking Defense)
Three more successful all-up ARRW tests required before production decision (Air & Space Forces Magazine)
U.S. Army plans multiple Long-Range Hypersonic Weapon tests ahead of late 2023 fielding goal (Aviation Week Network)

5G.MIL NEWS

LM and Intel demonstrate 5G capabilities for military aircraft use (Avionics International)

SPACE SYSTEMS NEWS

LM Space leader aims to speed things up (Space News)
Artemis 1 success earns widespread praise (Space News)
As NASA's Orion capsule blazes home, Denver's Lockheed Martin employees celebrate (Colorado Public Radio)
NASA commits $2 billion for three more Artemis program Orion capsules (Florida Today)
Blue Origin teams with LM, Boeing for NASA moon lander (Reuters)
NASA's $25.4 billion budget for 2023 includes funding for second moon lander alongside SpaceX Starship (Space.com)
Sierra Space, LM create human habitats for missions beyond the moon (The Denver Gazette)
Under pressure! Watch a Lockheed Martin inflatable space habitat explode (Space.com)
NASA to continue Lunar Trailblazer despite cost overrun (Space News)
NASA declares end of InSight Mars mission (Space News)
Hubble sheds new light on NASA's DART asteroid impact target (Aviation Week Network)
NASA and SpaceX to study possible private Hubble servicing mission (Space News)
NASA requests information on Hubble reboost options (Space News)
NASA cancels climate change satellite to monitor greenhouse gases (Space.com)
LM, NVIDIA to make digital twin of Earth's weather for NOAA (Aviation Week Network)

Space Force orders three GPS satellites for $744 million (Space News)
Terran Orbital delivers 10 satellite buses to LM for U.S. military constellation (Space News)
LM to build more submarine-launched nuclear missiles (Military & Aerospace Electronics)
Space Force readies narrowband satellite communications solicitation (Federal Times)
York Space wins $299 million Space Development Agency contract for 12 satellites (Space News)
United Launch Alliance's debut Vulcan mission slips to 2023 (Reuters)
Amazon to launch two Project Kuiper satellites on Vulcan's first flight (Space News)
ULA chief Tory Bruno says DoD should "block buy" heavy launch services as supply is tight (Space News)
ULA launches two SES satellites to near-geostationary orbit (Space News)
Atlas 5 launches weather satellite, reentry tech demo mission (Space News)
NASA calls test of inflatable heat shield a success (Space News)

AERONAUTICS NEWS

F-35 might not ever reach $80 million target again, LM exec says (Breaking Defense)
F-35 funding is running $1.4 billion short, Pentagon tells Congress (Bloomberg News)
LM reveals big F-35 order, admits delivery setback (Aviation Week Network)
Pentagon awards LM $1 billion for F-35 long lead items (Reuters)
DoD inks waiver for deliveries of F-35s, halted over Chinese materials (Defense News)
Fake parts: A Pentagon supply chain problem hiding in plain sight (Federal Times)
Pentagon won't lift F-35A lightning restrictions after hardware and software fix (Breaking Defense)
Company-owned F-35B crashes in Texas, pilot safely ejects (U.S. Naval Institute News)
Football-sized device could transform how the U.S. Air Force collects F-35 data (Defense News)
F-35 users huddle in Italy to tout joint maintenance plans (Defense News)
Frustrated South Korea says its F-35 stealth fighters are marred by defects (The Eurasian Times)
Germany clinches $8 billion purchase of 35 F-35 aircraft from the U.S. (Defense News)
SAAB voices opposition to Canada's F-35 decision (FlightGlobal)
Special Ops forces get fewer new gunships than promised as Air Force cuts AC-130J buy (Defense News)
Watch this U.S. Air Force MC-130J cargo plane launch a JASSM-ER cruise missile in Norway (Defense News)
Air Force grounds most C-130Hs due to cracked propeller barrels (Defense News)
Mechanics may have accidentally forced the Air Force to ground more than 100 C-130s (Military.com)
Australia in $6.3 billion deal for C-130Js amid mounting tensions with China (Defense News)
Bulgarian parliament votes to buy F-16s in $1.3 billion deal (Defense News)
U.S. may approve F-16 sale to Turkey, Erdogan's spokesman says (Reuters)
Bahrain to receive first batch of Block 7- F-16s in early 2024 (Breaking Defense)
Lockheed Martin to provide new mini drones for British Army (The Defense Post)
Lockheed Martin's Skunk Works installs GE engine on NASA's X-59 supersonic aircraft (Military+Aerospace Electronics)
Lawmakers plan to pressure U.S. Air Force to continue bridge tanker competition (Aviation Week Network)
If Air Force skips KC-Y tanker race, LM says LMXT could compete for KC-X (Breaking Defense)
LM's first female F-35 test pilot will soon be flying F-16s over the Carolinas (WCNC-TV News)
McLaren partners with LM on road car technology (Road & Track)

MISSILES AND FIRE CONTROL NEWS

Army awards LM $500 million deal to replenish GMLRS rockets (Defense News)
Army awards LM $431 million HIMARS contract (The Defense Post)
HIMARS transforms the battle fir Ukraine – and modern warfare (The Wall Street Journal)
U.S. modified HIMARS rocket launchers to keep Ukraine from firing missiles into Russia (The Wall Street Journal)
Pentagon sending guided artillery, more HIMARS to Ukraine (Defense News)
U.S. industry cranks up HIMARS production as Ukraine war intensifies (Politico)
Defense plant in Camden growing; LM to add missile capacity (Arkansas Democrat Gazette)
U.S. denies Ukraine's request for long-range ATACMS missiles in latest arms gift (Defense One)
Analysis: Why the U.S. is giving Ukraine a Patriot air defense system (The Washington Post)
Lithuania signs $496 million deal to buy HIMARS, ATACMS (Defense News)
Australian defence force to spend A$1 billion acquiring naval strike missile and army rocket systems (The Guardian)
LM eyes manufacturing PAC-3 missiles with inertial navigation and terminal radar guidance (Military-Aerospace Electronics)

LM doubles Joint Air-to-Ground Missile range in flight test (Defense News)
U.S. Army weighs options on extending range of Precision Strike Missile (Defense News)
Army seeks mid-range missile to cover operational gap (Defense News)
LM delivers first Typhon missile launcher to U.S. Army (Breaking Defense)
Israel's Rafael, LM to develop high-energy laser weapon system (C4ISRNet)
LM discusses results of U.S. Army's long-range munition shoot-off (Defense News)
Spike missile heads toward long-range precision munition shoot-off (Defense News)
LM, Thales move to bolster Australia's sovereign missile push (Breaking Defense)
Estonia buys HIMARS, as eastern allies boost artillery arsenals (Defense News)
Australia considers manufacture of HIMARS missiles (Australian Defence Magazine)
LM proposes anti-ship missile for Australian HIMARS (The Defense Post)

ROTARY AND MISSION SYSTEMS NEWS

Textron's Bell Helicopter wins largest U.S. Army helicopter order in 40 years, defeating Sikorsky-Boeing team (Defense News)
What Sikorsky losing the Black Hawk replacement helicopter contract means for Connecticut, business (The Register Citizen)
Sikorsky challenges U.S. Army helicopter award (Defense News)
U.S. Navy declared full-rate production for Marine Corps' CH-53K helo (Defense News)
U.S. Air Force's new search-and-rescue helicopter heads to first deployment (Air Force Times)
Unmanned Black Hawk program in Army's hands as ALIAS robo-helo takes likely final flight (Breaking Defense)
UK selects four competitors to fight for New Medium Helicopter contract (Breaking Defense)
UK Royal Navy reviewing specifications for struggling Crowsnest AEW program (FlightGlobal)
Sikorsky to enter the advanced air mobility race with new hybrid-electric VTOL (Vertical Magazine)
LM to upgrade Aegis weapon system for Guam deployment (The Defense Post)
Palantir, LM team up to modernize naval combat systems (Defense News)
LCS Sioux City completes "historic" deployment (Defense News)
Four-year-old LCS Wichita suffers propulsion plant casualty (Defense News)
LM to provide U.S. Army with civilian cyber training (The Defense Post)

Holiday Celebration
December 7, 2022

Wellshire Inn Holiday Fireplace

Ken Marts, Rene Watson at the
2023 Events Table with Mike Lohaus

CCU Quartet: Diego Margula, Kayla Rowland,
Brianna Bettis, Levi Thompson,
David McNeil-Director, Mari & Bill Wise

Dave & Carol Zeller, Rose Wasendorf

Dick Sosnay and USMC Toys for Tots Representatives
LCPL Jay Ridgeway and SGT Jose Ramos

Debbie Carr, Mike & Rene Watson

Judy Nielsen, Karen Paulson, Carole Lovelace

Heidi Urie, Beth Worthington, Glenda Florea

Mike & Jerre Gardiner, Debbie Fowler

Paula Pinkley, Carolyn Malaby,
Jo Green, Kaz Hellickson

Nora Dunn, Rita Nicholson, Bill Hershenow

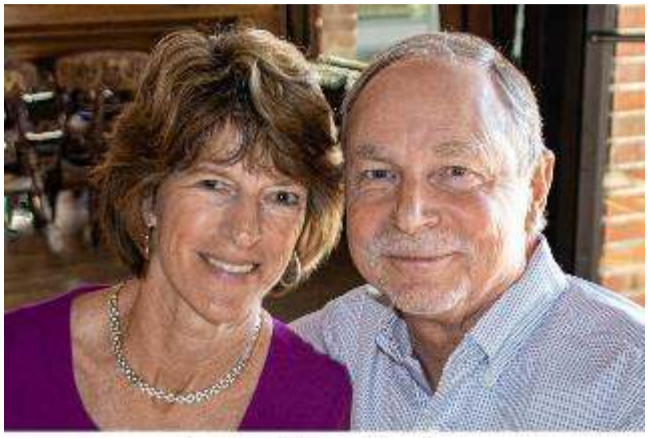
Amy Hefestay

Paula Ochs, Pattie & Mike Ochs

Betty & James Johnston

Bob & Debbie Adamoli

Bob & Jo Wessels



Anne and Tom Henning

Brad & Lori Harper

Beverly and Gary Warren

Carl Kaminski & Linda Duby

Cheryl & John Grace

Dave & Gloria Schwiesow

Dan & Lucy Ellerhorst

Debbie Adamoli & Bev Baugher

Dave & Georgia Stealy

Don & Lynae Foley

Gary & Margie Flora

Jeanne Macdonald, Cookie Steen

Glenda & Charlie Haupt

Judy Sullivan, Ralph Pacheco

Janice & Tom Redfield

Julie Tarpley

Kathy & Gary Hetzel

Leo Johnson & Joni Rosenberger

Larry & Barb Davis

Linda & Don Purkey

Leo & Barb Maloney

Lori Boxler, Sylvia Dinges

Marilynn & Al Nemes

Maureen & Ron Gedeon

Mary & Darold Groat

Mike & Shirley Pfister

Mary Jo Kellogg, Cindy VanBaskirk

Penny & Larry Beaumont

Robin Zen, Mark Nash

Rusty & Charlie Adinolfe

Roger & Kathy Rieger

Sandy Thimmig & Warren Luckow

Roy Duszynski, Mike Bartlett

Sharon & Gerry Boisvert

Vicky Ellis, Debbie Mues

Teresa & Paul Cline

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Schedule Addendum (See last page)

NOTES:

1. BOD meets as required
2. Officers/Directors meet 1st Wednesday of every month at 09:30 am.
3. Bridge Club meets 3rd Friday of every month at 10:00 am at Buck Recreation Center.
4. Car Club meets 1st Sat of every month, and as noted on their website.
5. Dinner Club The Dinner Club is currently looking for leaders to step forward to help plan future events
6. Golf club meets every Thursday from April through Oct of each year.
7. Hiking Club: Outings on 3rd Wednesday of the month. Check website for Point of Contact for each hike.
8. Photo Club meets 2nd Thursday every month (except Jun, Jul & Aug) at 1:00 pm on Zoom
9. Web Committee normally meets on last Tuesday of month, prior to BOD/Officer mtg, at a designated restaurant or by Zoom.
10. Marketing Committee meets on a monthly basis as determined by members with guests invited (Typically last Thursday)

***11. 2023 Happy Hour Dates and Locations are tentative; MARS website will have details when available**

12. 2023 Spring Event and Annual Meeting is Mar 1, 2023 at Arrowhead Clubhouse at 1PM
13. 2023 Summer and Senior Recognition Luncheon - July 12, 2023
14. 2023 Rockies Game - TBD
15. 2023 Annual Picnic -Sep 13, 2023 at Clement Park
16. 2023 Holiday Celebration - Dec 6, 2023 at Wellshire Events Center

17. See MARS website (https://marsretirees.org) for addittional information on our Special Events.

Please review dates and times and notify Ken Marts (martshouse2@aol.com) if you have any changes or additions.

MARS ASSOCIATES

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

' ADDRESS SERVICE REQUESTED

DATE: January 2023

EVENT/MONTH	2023 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Officers/Directors	4	1	2	5	3	7	5	2	6	4	1	5
Bridge Club	20	17	17	21	19	16	21	18	15	19	17	21
Car Club	7	4	4	1	6	3	1	5	2	7	4	2
Dinner Club	-	-	-	-	-	-	-	-	-	-	-	-
Golf Club	-	-	-	Thur	Thur	Thur	Thur	Thu	Thu	Thu	-	-
Hiking Club	18	15	15	19	17	21	19	16	20	18	15	20
Photo Club	12	9	9	13	11				14	12	9	14
Web Committee	31	28	28	25	30	27	25	29	26	31	28	28
Marketing Committee	3	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
MARS Events												
Happy Hour	25			TBD			TBD			TBD		
Spring Event and Annual Meeting			1									
Summer Luncheon with Senior Recognition							12					
Annual Rockies Game							TBD					
Annual Picnic									13			
Holiday Celebration												6
MARS Special Events												
MARS STAR Schedule												
Items due for MARS STAR												
STAR Input to Editor	5			6			6			5		
STAR Repro. Deadline	16			17			17			16		
STAR Mailing	25			26			26			25		