

MARS STAR



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

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REMINDER:

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

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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

MARS Associates

P. O. Box 1128

Littleton, CO 80160-1128

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

MARS Facebook:

<https://www.facebook.com/groups/MARSAssociates>

Cover:

L: ATLAS V SES 20 & SES 21 - Ready for Launch, Oct 4, 2022. See article on pg. 21.

R: The Cumbres-Toltec Train heads into the canyon toward Cumbres Pass.

From the Editor's Desk

Linda Stearns (linda80120@comcast.net)

Tom Pighetti (tipighetti@q.com)

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

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

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



President's Corner

By Dick Sosnay

richardsosnay@gmail.com

The year is rapidly drawing to a close and we are having a great year for MARS. Our Annual Picnic at Clement Park had around 230 people. It was fun to see so many friends, enjoy the weather, food and car show. With our

upcoming Holiday Celebration on December 7, we will have had our five major events, 4 Happy Hours, a Cassini Zoom Presentation, two Medicare 101 presentations and eight Special Activities with over 250 attendees. Thanks to all our officers and directors, and especially thanks to all our many volunteers, who have contributed to making this year so enjoyable for all our members.

Along with all the enjoyment we have had at all of the MARS activities, we have had some struggles finding new venues for our activities and some new vendors. Thanks for all your feedback on how we are doing. We will continue trying to improve our events and activities to make them even more enjoyable.

As I mentioned in several President's Corner articles, we have been evaluating our finances. Included in that study were data from the last 14 years. We evaluated costs to MARS, subsidies provided by MARS and resulting costs per member for all major events. We also evaluated all other MARS expenses, including bank, overhead, club support, charity/In Memoriam donations, software licenses, insurance, picnic door prizes, and Happy Hour costs. That study is now complete and ready to share with our members. The result is that our yearly membership dues will increase for all 2023 membership renewals. The following table shows the new dues structure:

Membership Status	Current Dues	New Dues 2023 Membership Renewal
In-State Regular	\$15	\$25
In-State Senior	\$10	\$15
Out-of-State Regular	\$10	\$15
Out-of-State Senior	\$10	\$15

Since most of the benefits of MARS participation go to In-State members, we increased their yearly dues by \$10. For all other members (In-State Seniors and all Out-of-State Members) we increased their yearly dues by \$5. This is the first dues increase in the memory of all current officers/directors. When MARS was founded in 1985, the dues were \$10 per year. Based on inflation statistics alone, that price today would be \$27.52. As we noticed our costs climbing, we felt that we either had to increase our dues or cut back on the number and/or quality of our events; we did not want to do that. While it is hard to predict the future, in particular with regard to inflation, we hope that this dues increase will suffice for many years to come. Thank you for your understanding.

The Marketing Committee is currently in the planning stage for the special activities that we will propose for next year. That will include a mixture of repeating some from this year, plus some new activities. As always,

member feedback and suggestions are greatly appreciated and very helpful.

As I have said many times, we are a volunteer organization, and we are always looking for volunteers to support us. That includes not only being an officer or director, but also all the other volunteer positions we have, including MARS STAR editors, Historian, Volunteer coordinator, managing our Memorials section of the MARS STAR, helping the web committee, and managing and running the MARS website and the MARS Facebook page—and running one of our MARS clubs, including the Bridge Club, Car Club, Dinner Club, Golf Club, Hiking Club, and Photography Club. Becky and Gary Englebright have been leading the Dinner Club since 2017. After the first of January, they are stepping down from that position. Thank you, Becky and Gary, for letting our members enjoy the many dinners that you have organized over the last 5 years. We are currently looking for replacements for Becky and Gary to run the Dinner Club. Until we find someone, the Dinner Club activities will have to go on a pause.

And just as we have members leaving a volunteer position after they have completed their service, we have new members stepping up and volunteering. Jerry Sobetski would like to know if we have enough members interested in starting a Bicycle Club. If you are interested in an occasional bike ride with MARS members, please let Jerry know at jerome.sobetski@gmail.com. Let him know what kind of biking you like (i.e., road bike, mountain bike, recreation path), what skill level you are and if you are interested in leading a ride.

We are continuing to update the software behind our website. The intent is to modernize that application, make it more readable and user friendly, and reduce the workload on our web committee that maintains and updates the website. We have made a lot of progress and you will find more information in the coming months in blast emails, on the website, and in subsequent MARS STARS. And, as we migrate to our new website software, our long-term Webmaster, Jim Kummer, is looking for somebody to take over his responsibilities. The new website software will make that role a lot easier. So please let any of the officers, directors, or anyone on the web committee know if you are interested in helping.

As I have requested in previous MARS STARS, if you are a volunteer in a local organization, we are interested in hearing about it. We will help you promote that organization in the MARS STAR. That lets other MARS members know about it, you can provide information about what that organization does, and how interested MARS members can also join that organization. We provide a \$50 donation to the organization as thanks for your writing an article in the MARS STAR. For this issue,

we have a great article on volunteering for the National Western Stock Show here in Denver. If you are interested in promoting your volunteer organization in future MARS STARS, please let us know.

Coming up in December, I hope to see many of you at our Holiday Celebration. As I write this article, I noticed that this is my twelfth article as president of MARS, and it is my final article. In January, 2023, I turn over the president's duties to Ken Marts. It has been a pleasure working with Ken as both a director and as the president elect, and I know from seeing his energy, enthusiasm and ability that Ken will do a great job. Thanks for all your continuing support, and I am looking forward to another exciting and interesting year for our MARS Association.



Next Up

By Ken Marts

martshouse2@aol.com

This will be my last issue writing to you in the "Next Up" column as President Elect. In January, I have the privilege to step forward as President of MARS Associates. Dan Ellerhorst provided significant mentoring, although he may not have known it at the time, as did Dick Sosnay in preparing me for this transition. My wife refers to me as a "younger-older" member or a "newbie." I've been a member for just over three years now and I know many of you have been members for 20-30 years. In that short time, I've engaged with the Marketing Committee thru Bill Wise, and we've planned a lot of great activities (known as Special Events), outside of our annual lunches and recognition events. I've met many of you at these usual events as well as the special events and hope to meet more of you in 2023. Moving forward we have some positive changes we're implementing that will continue to attract new retirees without alienating our current members. These changes include:

- 1) An updated website platform to reduce the workload on our web committee and to provide enhanced access for platforms other than PC's .
- 2) Additional opportunities to participate in Happy Hours (quarterly) and special events (train rides, museum tours, and more).
- 3) Continued Facebook updates on "This Day in History" by Barb Sande
- 4) Potential new MARS STAR features like: "Sharing a vacation in pictures", "I remember when (memories of key moments in our careers)," and maybe more.
- 5) A suggestion box for members to give us your thoughts on events, things you'd like to see or hear

about in the MARS STAR or the website, comments on how to improve MARS Associates, etc.

Looking back on 2022, we held ten events that were new:

- 1) Jan - Frisco Sleigh Ride and Dinner
- 2) Mar - LM Plant Tour
- 3) May - DMNS Tour and James Webb Telescope briefing
- 4) June - Cassini briefing and Discussion Table
- 5) June - Durango-Silverton Train ride and dinner
- 6) July - Wings Over the Rockies Tour
- 7) Aug - Royal Gorge Train Ride and Winery visit
- 8) Sep/Oct - Estes Park Observatory
- 9) Sep - Cumbres-Toltec train ride and dinner
- 10) Quarterly Happy Hours with appetizers

Based on interest, several of these will be repeated in 2023, along with some new activities. If any of you have thoughts on activities you'd like to see offered, as well as helping organize these activities, please let the officers know so we can work them into the Marketing Committee.

Lastly, I need to hear from at least a few of you on your positive thoughts and what you're thankful for so I can include these (anonymously) for the January or April MARS STAR.

I look forward to my two years (2023 and 2024) as your new president and hope to see you at our upcoming events including the Holiday Celebration Luncheon in December.

Ken Marts
(303) 868-2168

GD Pension Underpayment

Mark Brown

ruthmark@comcast.net

I recently received a phone call that brightened my day, week, and month. An old friend and co-worker called to say that he had followed my instructions below and had just been rewarded with a letter from General Dynamics that informed him that his monthly pension checks would nearly double going forward. Also, in the envelope was a check for multiple tens of thousands of dollars to compensate him for underpayments since his retirement years ago. He was ecstatic and planned to use that check to buy himself a new car.

In case you missed my MARS article from two years ago, here it is in full:

"If you are part of the group of heritage General Dynamics employees who transitioned to Denver in 1994, read on. It could earn you a pretty penny.

- In 1994, General Dynamics sold its Space Systems Division to Martin Marietta. At that time, the companies agreed that the hundreds of affected employees would receive full pensions; that is, their pensions would be unreduced due to the switch in employers. Both companies would compute the GD portion, which GD would pay, and which LM would subtract from their computed full pension.
- The management of the GD pension plan has rolled over several times, currently residing with Fidelity, and in those many transitions the data was corrupted. Employee data – such as dates of employment, marital status, and employment status – may have become inaccurate. In my own case, my Termination Date was in the 1990s when it should have remained "Active" till my retirement from LM, resulting in GD offering me less than $\frac{3}{4}$ of the value I had earned. For a co-worker, her dates were in error resulting in GD paying only half of the value she had earned.
- A Fidelity representative admitted that this is a common problem, though none of these organizations will pro-actively inform these pensioners of the potential problem or correct it for them. Instead, it is the responsibility of individuals, or their heirs, to do so.
- The process is simple.
 - (1) Call the LM Employee Service Center, 866-562 2363, and request a "detailed pension calculation" of your pension.
 - (2) Call Fidelity/GD, 888-432-3633, and request a "back office investigation" of your pension.
 - (3) Compare the LM value (Detailed Calculation, page 5, Fort Worth Benefit section, c5) with the GD value (Accrued Benefit).
 - (4) If they are different, inform Fidelity/GD of the discrepancy and request both retroactive correction of the underpayment and future correction of pension earnings.
- Lastly, if you do go through this process, please write me an email about your experiences. I will be interested to learn what you discovered. It troubles me to think that many of my former GD heritage co-workers, and their heirs, may not be receiving all of their hard-earned pensions."



Director's Notepad

By Roger Rieger
Chairperson, BoD

rrieger10731@gmail.com

Greetings everyone! Hope you have been able to enjoy some of the many new activities put on by your MARS Associates club this past year. Ideas for these new events often are started within the MARS Marketing Committee which is headed up by Bill Wise, and from survey inputs from MARS members received at last year's holiday event.

These new events do not happen without someone stepping forward to volunteer and organize an event. Your club has many, many, talented people with a variety of interests and it's great to see some new volunteers step forward. 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 Bill, 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! Contact information can be found on the inside cover of this STAR.



Activities Updates

By Linda Duby

lindaduby@comcast.net

MARS has had several successful events this summer. It's been challenging to put on these events given the current cost of everything including the facilities. With that said, I am trying to find reasonably priced locations for these events.

The **Luncheon Honoring Senior Members** was held at the Ken Caryl Manor House on July 13, 2022. We had 85 members and guests enjoy the excellent food and service at the Manor House. This facility is always a great venue for a summer luncheon. Pictures from the event are in this edition of the STAR.

MARS at the Rockies Picnic and Game had 54 members signed up! We enjoyed a menu of brats, hot dogs, chicken legs, chips, potato salad, vegan patties, condiments, unlimited fountain drinks and cookies, along with a cash bar for wine and beer. We sang a rousing "Happy Birthday" to Paula Pinkley and had two winners

for the Rockies gift certificates (for four tickets to a weekday game each): Linda Berry and Mollie Christensen. With perfect baseball weather, we enjoyed the game from our usual seats in section 145 especially when the Rockies beat the White Sox 6-5!

The **Happy Hour** on August 10 at the Lansdowne Arms was a great success. Thank you to Terry Lilly for organizing this event. We had approximately 70 people enjoy this happy hour. The Lansdowne Arms staff did a great job at the bar and keeping the food replenished. These happy hours are fun, informal events and we will be doing them again next year.

On September 14 the **MARS Annual Picnic** was held at Clement Park. We had an excellent turnout of around 230 members and guests. The food was very good, and I had positive feedback on the quality of the food. I realize the caterer ran out of side dishes and I will ensure that there are enough side dishes next year. This has happened in the past—we usually ran out of ribs and cookies, not side dishes. It's always a learning experience especially for a new caterer!

The vendors that supported this event were Beta Health, Delta Dental, Assured Partners, Kaiser Permanente, Red Rocks Credit Union and Osher Lifelong Learning Institute. Thank you to the vendors who provided door prizes.

Door prizes were also provided by Lockheed Martin and United Launch Alliance. Congratulations to all of the winners who are listed below.

Prize	Winner
Red Rocks Credit Union Gift Basket	Sarah McKinney
Delta Dental Electric Toothbrush	Terry Lillibridge
Assured Partners Panera Gift Card	Tom Lisec
Assured Partners Panera Gift Card	Mike Bartlett
Kaiser Permanente Cutlery Set	Charles Pippinger
Lockheed Martin LM Water Bottle	Fritz Berns
Lockheed Martin LM Cooler	Dan Tennesson
Lockheed Martin LM Blanket	Gerry Barck
United Launch Alliance ULA Hat & Notebook	Fred Luhman
United Launch Alliance ULA Hat & Notebook	George Eiger
United Launch Alliance ULA Hat & Notebook	Jim Kummer
United Launch Alliance ULA Hat & Notebook	Dave Ernst

United Launch Alliance ULA Hat & Notebook	Karen Paulson
MARS Associates \$50 Cash Door Prize	Van Vandeventor
MARS Associates \$50 Cash Door Prize	Lisa Cox
MARS Associates \$50 Cash Door Prize	Larry Moore
MARS Associates \$50 Cash Door Prize	Eric Georges
MARS Associates \$50 Cash Door Prize	Jo Ann Adolf
MARS Associates \$50 Cash Door Prize	Rick Gonzales
MARS Associates \$100 Cash Door Prize	John Grace
MARS Associates \$100 Cash Door Prize	Dick Hurley
MARS Associates \$200 Cash Door Prize	Donna O'Neill
MARS Associates \$300 Cash Door Prize	Paul Cline

Pictures of the event are included in this STAR and on the website.

The final event for the year will be the **Holiday Celebration** on December 7, 2022 at the Wellshire Event Center. The Wellshire is located at 3333 South Colorado Boulevard. This venue did a great job last year, so we are going back. The food was excellent as was the service. The flyer for the event is in this STAR (pages 23-24) and is available on the MARS website. There are two payment options – mail a check to MARS with the coupon that is on the flyer and STRIPE for a credit card payment. The STRIPE link is on the flyer. If you use STRIPE, please make sure you complete the form with your menu selection, your guest's menu selection and that your credit card charge goes through. You should receive an email confirming your reservation. All reservations must be received by November 22, 2022.

MARS again will be collecting donations for Toys for Tots at the Holiday Celebration. Toys for Tots accepts new, unwrapped toys or you can make a monetary donation. We will have boxes for the toys and a container for monetary donations at the check-in table.

2023 National Western Stock Show (NWSS). I am currently working with the NWSS for its upcoming show in January, 2023. At this point, we plan to have a "MARS Day" at a rodeo on January 19 at 1:30 p.m. which is a discounted event for all seniors. The NWSS is working on a calendar of events that will be available to MARS members at a discount and I will be posting that on the website. The prices for rodeos will include general admission to the show. More information to

follow on the Stock Show. See the flyer in this STAR on page 27.

If you have any questions or comments about events, please contact me at lindaduby@comcast.net.

MARS Royal Gorge Train Ride - Aug 17, 2022

By Ken Marts

On August 17th, a group of 9 enjoyed a ride on the Royal Gorge Route Railroad along the Arkansas River, starting in Canon City.



Ken & Cheryl Marts, Charlie & Glenda Haupt,
Debbie Mues, Vicki Ellis, Pete Munoz,
Robin Zen and Mark Nash

We started the morning with breakfast at the Happy Endings Caboose Café in Canon City, before boarding the morning train at the Santa Fe Depot. Our seats were in the dome car, which provided great views out the side and top windows, and lots of photo opportunities. We also spent time on the open-air car, enjoying more scenery and the cool weather. Spectacular views of the Royal Gorge Bridge from 955 feet below, the high canyon walls, river rafters, river rapids, suspension bridge, remains from an old water pipeline, and a yurt camp were enjoyed by all. In Parkdale, the train turned around, heading back to Canon City.

Following the 2-hour ride, some members of the group made a short stop at the Winery at Holy Cross Abbey. Then we all met at the Colorado Mountain Brewery in Colorado Springs for lunch.

Cumbres-Toltec Train Ride - Sep 22, 2022

By Ken Marts

22 MARS members took a ride into the past on the Cumbres-Toltec train between Chama, NM and Antonito, CO. The Cumbres & Toltec Scenic Railroad is a National Historic Landmark that moves—a continuation of the Silverton-Durango narrow gauge train as a viable alternative to Denver in the 1880's (avoiding Wolf Creek Pass). At 64 miles in length, it is the longest, the highest and most authentic steam railroad trip in North America, traveling through some of the most spectacular scenery in the Rocky Mountain West.



Cumbres-Toltec Train: Bob & Debbie Adamoli, Michael & Maggie Cain,
David Clair, Horace Clair, Ervin & Zita Dean, Lorraine Ellis, Ben & Cleo Go,
Ken & Cheryl Marts, Larry & Mary Moore, Ralph Pacheco & Judy Sullivan,
Steve & Barb Sande, Bob & Janet Todd Photo by Larry Stearns

Engine 488 took us on our journey this day. Engine 488 is a typical "Mikado" K-36 2-8-2 (wheel configuration) narrow gauge steam engine; it was built by the Baldwin Locomotive Works in Philadelphia in 1925, bought by the Denver and Rio Grande Western railroad and then later given to the Cumbres & Toltec railroad.

Meeting in Chama the night before and having a wonderful dinner at the Local Restaurant (YES, that's what it's called), we awoke refreshed for a bus ride to Antonito followed by the train ride back to Chama with a brief lunch stop in Osier. The turning aspens were a delight for all and the weather (although rainy and overcast in spots) cooperated for some GREAT picture-taking. See the MARS website for more pictures of this event.

Estes Park Observatory - Sep 28 and Oct 3, 2022

By Dick Sosnay

What a great time in fall to go up to Estes Park and visit the observatory. We had 11 participants on the first visit and 8 participants on the second visit.

The drive up was fantastic with the aspens turning and all the fall colors. Walking around Estes Park was also beautiful, with the interesting tourist shops, the famous

Stanley Hotel, and elk in the middle of downtown. We met at Dave's Smoking BBQ for a wonderful meal prior to going over to the observatory.



Smokin'Daves: Dick Sosnay, Katie Cooke, Luanne Sosnay, Jan Hightower, Bob Humes, Connie Humes, Pete Munoz, Mike Connolly, Stan Hightower, Stan Wilkes, Sarah Chaikin and friend

After a brief overview in the auditorium by Mike Connolly, the owner and our tour guide, we moved up to the dome. When the dome was opened, we were able to observe the beautiful sights, including stars, star clusters, double stars, the spectacular rings of Saturn, and the amazing views of Jupiter and several of Jupiter's moons, all the while listening to the bugling of elk's right outside. The next day, many of us enjoyed the wonders of Rocky Mountain Park.



Business

By William Schrott
(wmschrott@msn.com)

The Annual Picnic was well attended, and the food was good. Hopefully, a lot of people got to meet and talk with vendors that were present. They were there to give members valuable information and help.

Do not forget to visit the VIA Benefits page to take advantage of the services they supply and their help in reimbursement of medical costs. Find the link to them on the MARS web site, just highlight the "medical benefits" icon, found on the left side of the web page.

We had our second "Medicare 101" class on September 14 at the Red Rocks main office. There was a total of thirty-four people in attendance for the two classes. There will more classes next year.



Membership Report

By Carl Kaminski
(carlkc66@gmail.com)

MEMBERSHIP STATISTICS

As of October 1, 2022, there are 1,312 MARS Associates members, including 633 senior members. We have a total of 81 new members who have joined MARS for the 2022 CY.

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

Colorado

Arvada	Karl & Jill Fortney
Aurora	Jim & Linda Fusselman, Judy & Jim Hardy
Bailey	Steve & Bonnie Jolly
Brighton	Steve Smetana
Denver	Gerald Gottselig, Georgia & Dave Stealy
Englewood	Doug & Pam Korbel
Highlands Ranch	Margaret & Joe Froechtenigt, Benjamin & Cielo Go, Ray & Katy Kile, Mike Dittmer, Peter Munoz
Indiana Hills	Richard & Virginia Steinhoff
Lakewood	Tim Halbrook & Arleen Knaub-Halbrook
Littleton	Adrian Bertuzzi & Susan Koeper, George Eger III & MJ Erickson- Eger, Jane Mattson
Monument	Bradley & Lori Harper

Other States

California

Lompoc Rodney & Juanita McAdams

Missouri

Branson Mike & Becky Pollard

Tennessee

Kingston Melody & Keith Mutschler

Texas

Colleyville Jorge Armijo

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

Brown, Duane (D: March 2022)
Centennial, CO
No obituary published

Long, Peggy J. (D: June 2022)
(Survived by LeRoy Long)
Lake Ozark, MO
No obituary published

Rogge, Donald (D: August 2022)
(Survived by Verena Rogge)
Littleton, CO
<https://tinyurl.com/3f9d8s7b>

Non-Members

Adamson, John V. (D: March 2022)
(Survived by Marie Adamson)
Larkspur, CO
No obituary published

Axelson, William "Bill" (D: June 2022)
Denver, CO
<https://tinyurl.com/rxfxhcjw>

Brown, Bertrum "Bert" (D: July 2022)
(Survived by Jackie Brown)
Littleton, CO
<https://tinyurl.com/2c4vcmyr>

Delano, Mark (D: July 2022)
(Survived by Maleah Delano)
Littleton, CO
<https://tinyurl.com/3aem6tee>

Demshur, Paul (D: June 2022)
(Survived by Jean Demshur)
Springfield, VA
<https://tinyurl.com/bdhtj873>

Frisbee, Ronald "Ron" (D: July 2022)
Cocoa, FL
<https://tinyurl.com/39tua8su>

Jaeger, Fred (D: July 2022)
(Survived by Merril Jaeger)
Bradenton, FL
<https://tinyurl.com/3xsvmj4m>

Schallennmuller, Betty (D: September 2022)
Centennial, CO
<https://tinyurl.com/ae63vysh>

Thulson, Gaile (D: September 2022)
(Survived by Mark Thulson)
Centennial, CO
<https://tinyurl.com/58evrvhk>

Tolbert, Terry (D: July 2022)
(Survived by Sharon Tolbert)
Cape Canaveral, FL
<https://tinyurl.com/4vfv6bj2>

Trujillo, Lloyd (D: June 2022)
(Survived by Jacquelyn Trujillo)
Las Vegas, NV
<https://tinyurl.com/3pjyz798>

Van Allen, Douglas "Doug" (D: August 2022)
(Survived by Mary Van Allen)
Monument, CO
<https://tinyurl.com/76ps25e5>

Warner, Tom (D: April 2017)
Peoria, AZ
<https://tinyurl.com/5475s9j2>

Wright, Debbie "Deb" (D: August 2022)
(Survived by Frank Wright)
Littleton, CO
No obituary published

Zercher, Ray (D: September 2022)
(Survived by Nancy Zercher)
Littleton, CO
No obituary published

The MARS Associates Website

By Jim Kummer
(jkummer@comcast.net)

As mentioned in the last STAR, the MARS Website Committee is hard at work implementing the new look on the website using WordPress, a more modern tool for designing and building websites. The transition to the revised website's format and improved functionality should take place around the end of the year. When we change over, I will retire as webmaster. I have been MARS webmaster for 20 years, and I think it time for someone new! We don't have a replacement volunteer yet, but the new implementation of the new website using WordPress should entail a much lighter workload for the webmaster. WordPress needs much less management than the prior format.

Committee member Al Butvidas has also indicated intent to leave the committee when the WordPress transition takes place.

Below are the websites of the month that the web committee has offered for your browsing pleasure this past quarter. We have no idea whether members value these sites, so we may discontinue them after the change.

**Sep – Innovation Ideas in
the [Smithsonian Magazine](#)
Aug – Science & Technology
profusion on [singularity.com](#)
Jul – Current Events in Space Flight,
www.spaceflightnow.com**

Your website committee members welcome your observations regarding the website. You can email me your thoughts at jkummer@comcast.net. Your website committee members are Rick Gonzales, Mark Brown, Linda Stearns, Al Butvidas, Bob Knickerbocker, and Jim Kummer (formerly Webmaster).

2023 National Western Stock Show



Mike Searle

NWSS Horse Show Liaison
masearle12@gmail.com

It's time to polish up those boots and dust off that hat, the 117th National Western Stock Show is just around the corner. As we put the pandemic further behind us, the crowds are growing and so is the need for volunteers. If you attend the Stock Show each year or maybe just once in a while, why not consider volunteering!

I started volunteering right after retirement and have been involved ever since. Not only is it satisfying but a ton of fun. Whether you're interested in livestock, horse shows or just want to be a part of the best 16 days in January, you'll find somewhere to fit in. Volunteering means you can work as much or as little as you'd like and come and go even when you're not working.

There are opportunities to work close with the animals, help with the ticketed Horse Show events such as Dancing Horses, Wild West Shows, Hunter Jumpers, opening day Parade, cattle drives, or get up close and personal with the Mule and Draft Horse events not to mention all of the Livestock events! If the animals don't excite you much, then maybe the Coors Art Room is more your style. There is always a need to welcome the public and if working in the many information booths fit you better or maybe photography is your interest, whatever it is, there is always someplace where you can fit in at the National Western Stock Show.

When you Volunteer at the Stock Show, you are also eligible to work at any of the many events that take place at the National Western Complex throughout the year. Those hours go towards the 30-hour minimum they ask you to consider, *and* those 30 hours entitle you to an amazing year-end prime rib celebration as well as other perks...what could be better? There are a few more Zoom get-acquainted events still to come in October and November and formal training to occur on December 10th. Please take a look the NWSS Website <https://nationalwestern.com/livestock-shows/livestock-exhibitors/>, pull down "GET INVOLVED," then click on VOLUNTEERS: there you'll find all you need to know about how and what it means to be a Volunteer. Feel free to email Kellie Lombardi (NWSS Staff Volunteer Director) klombardi@nationalwestern.com or contact me if you have any questions. The National Western is a 501(c)(3) nonprofit that provides over 100 scholarships each year to young people in support of the agriculture industry. I look forward to the Stock Show every year

and I know you will too! Hope to see you at the 2023 National Western Stock Show!

Historian Corner

By Barb Sande

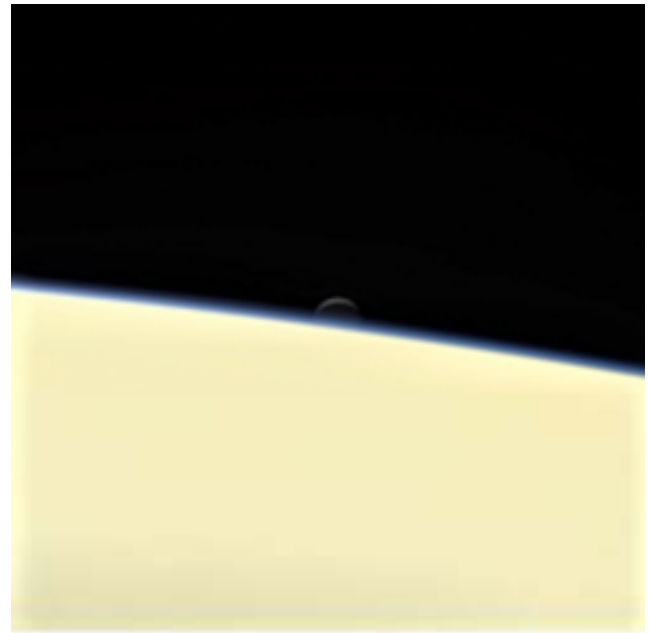
barbsande@comcast.net

Program Profile

This issue commemorates the 25th anniversary Cassini/Huygens mission to Saturn, which launched on a Titan TIVB/Centaur on October 15, 1997. The profile includes highlights from the discussion that I facilitated in a Zoom roundtable held in May, 2022 on the challenges for supporting and launching this major planetary mission. Several participants in the roundtable were kind enough to send written summaries of their efforts for this mission; those summaries and my notes from the roundtable are used for this profile.

Cassini/Huygens Major Mission Milestones

- Launched: October 10, 1997 08:43:00 UTC LC-40, CCAFS (now Space Force Station)
- Launch Vehicle: Titan TIVB-33 (401B) with Centaur upper stage (TC-20)
- Saturn Orbital Insertion: July 1, 2004 02:48 UTC (after a Venus-Venus-Earth-Jupiter Gravity Assist Trajectory)
- European Space Agency Huygens Probe landing on the moon Titan: January 14, 2005
- Number of Orbits of Saturn: 294
- End of Mission: Controlled entry into the atmosphere of Saturn, September 15, 2017 (Cassini had three mission extensions after its primary mission)

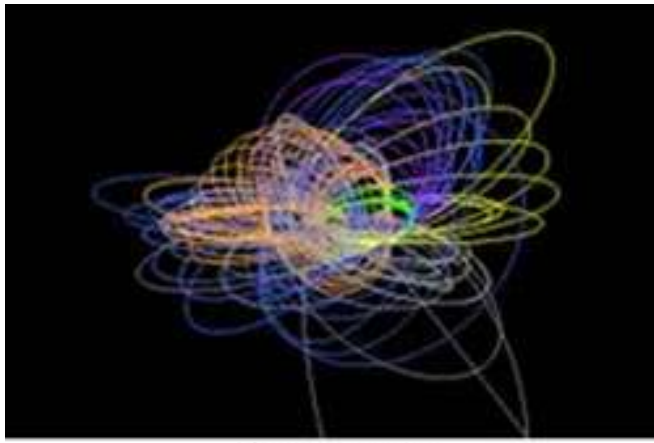


One of the Last Photos from Cassini
Enceladus Rises over Saturn
September 13, 2017
Photo Credit: NASA/JPL/ESA

The End of a Triumphant Planetary Mission

On Friday, September 15, 2017, the extraordinary Cassini spacecraft ended its final extended mission to Saturn by diving into the atmosphere of the giant ringed planet. This occurred on orbit number 294, after it had completed a risky last "Grand Tour" of the Saturnian system requiring several passes between the rings and the planet itself. Many mission controllers at JPL shed tears for the planned end of this mission, even though data will still be analyzed for years. I cried that day, too, as I consider this mission to be a career highlight (I retired after 37 years at Martin Marietta/Lockheed Martin exactly two months after the demise of Cassini).

I was on the launch team for the Titan Mission Success group at the Cape for the launch (see roundtable highlights) and I taught school groups and other organizations about the findings of the mission as a JPL Solar System Ambassador for quite a few years (my husband Steve also was a Solar System Ambassador for a few years and we did many presentations together). I followed the mission closely during the 13 years Cassini was at Saturn because of personal interest and to understand the discoveries that were made when doing this volunteer outreach work. The Solar System Ambassador program is a wonderful way to get the word out to the public about what the NASA/JPL programs are doing; the application for acceptance was longer and more intensive than a classified program clearance that I received.



The Yarn Pattern
Map of the Cassini Orbits of Saturn/Titan
during the Missions
Photo Credit: NASA/JPL/ESA

During the nearly 20 years the Cassini mission was in space and the 13 years at Saturn, nearly 2.5 million commands were issued, 635 gigabytes of data were collected, it traveled 4.9 billion miles, had 294 total orbits of Saturn, had 360 engine burns, took 453,048 images, and flew by the moon of Titan 127 times (Titan was a "pivot point" of the many orbital paths up to the final Grand Tour). Cassini had close flybys of most of the other major moons of Saturn, many smaller moons and, of course, the rings of Saturn, including increasingly risky dives between the rings and the planet during the final "Grand Tour." Cassini also discovered seven new moons and unveiled the unique characteristics of the moon Enceladus, which has a likely internal ocean and is venting material onto its surface and into space. The European Space Agency provided the Huygens probe, which separated from Cassini and landed on the moon of Titan early in the mission and survived over 90 minutes on the surface of that large moon. Cassini mapped nearly 50% of the surface of Titan and determined that it also has a subsurface ocean of water and ammonia, along with seas of methane and ethane.

Cassini Mission Roundtable

On May 12, 2022, I facilitated a Zoom roundtable discussion about the Cassini mission (see link at the end of the article). Invitations were sent out earlier this year to round up some folks who were actively involved in that mission and the MARS members were invited to call in and hear the stories and ask questions. The audience participation was disappointing, but the panel was fantastic, full of fun anecdotes and shared memories. I thank the panel members for their participation! The final panel included the following members:

- Bob Jaquess: Mission Manager from the beginning of formal integration until retirement in 1994
- Leo Johnson: Titan IV Mission Manager for the Cassini mission after Bob's retirement

- Monte Kopke: Electrical Systems Manager (also Hydraulics)
- Jason Cowley: Avionics Mission Design/Payload Integration for Cassini mission
- Becky Bramlage: LM Payload Integration and Ground Mechanical (Becky had to leave the roundtable before she could participate in the discussion)
- Keith Hamlyn: Propulsion Module Systems Engineering for Cassini (Spacecraft Main Engine Assembly)
- Mark Edson: Booster Vehicle Harness Integrity Testing and Single Point Ground
- Tom Sayuk: Ground Mechanical Payload Integration (participated via notes shared with Jason Cowley)
- Barb Sande: Titan Systems Mission Success

The comments for each participant come from the panel discussion and/or notes that several of them provided before or after the Roundtable event.

Commentary by Bob Jaquess Mission Manager until 1994 (from the mission summary document he created):

The Cassini Spacecraft and Huygens planetary mission to Saturn was an extremely ambitious undertaking at the time. A follow on to the Voyager 1, 2 and Pioneer 11, the science objectives would take full advantage of the technologies at the time. It was hoped that this \$3.3 billion mission (cost at launch) would provide answers to the many questions that the Voyager and Pioneer Spacecrafts had left unanswered in their very brief flyby of Saturn. Cassini and Huygens were loaded with science instruments and sensors for gathering as much data as possible.

The Mission Plan called for orbiting Saturn and exploring Saturn's Moons. It was a joint endeavor that would involve NASA, Jet Propulsion Lab (JPL), European Space Agency (ESA), Martin Marietta (now Lockheed Martin), General Dynamics who would provide the Centaur Upper Stage, and the Air Force. NASA and JPL would provide the Cassini Space Craft, ESA would provide the Huygens Probe, the Air Force would provide the Titan IV Launch Vehicle, and Lockheed Martin would provide the Payload Integration Process. The Cassini Mission consisted of three major parts. There was the Payload integration phase, the Hardware Building Phase and the Mission Phase. The integration phase began at Lockheed Martin in the early 1990's.

Early in the program Cassini became characterized by the progression of special studies. A primary objective was to accomplish the program in such a way that the primary mission would achieve 100% of the science objectives by launching on the primary launch date. Delaying to the backup launch date would yield only 80% of the science objectives. Delaying to the second backup launch date would yield only 50% of the science objectives, any

further delays would result in such a small amount of science objectives being achieved the program would be terminated.

Three of the major concerns that could jeopardize the primary launch date was the availability of the Air Force-provided Titan IV Launch Vehicle, an injunction obtained by some 26 Environmental Activist Groups, and the weather. The primary mission for the Titan IV Launch Vehicles was national security. Any new security concern could result in the Air Force exercising priority either on the launch vehicle assigned to the Cassini Mission and or the launch date. Weather was another concern of which very little could be done to mitigate any adverse conditions.

A special project was initiated by Lockheed Martin Payload Integration Team to identify mitigations for the possible injunctions to stop the launch. The Environmental Activist Groups had become aware that the Cassini Spacecraft would be using nuclear power source in the form of plutonium power sources. They were concerned about the pollution that could occur if there was an accident. A special team was assembled in Payload Integration that was comprised of Roy Adams, Dr. Kevin Rudolf, Dr. Robert Lee and Lynn Zoller. This team were the primary authors of what became known as the Radioisotope Thermoelectric Generator (RTG) Safety Data Book. The book addressed the possible risk that could occur and the mitigations to these risks. Lockheed Martin's cost for the preparation of the RTG Book was \$7,000,000! The book was successful in convincing Federal Judges to deny the numerous injunctions.

Another study consisted of trying to determine what problems that could occur that would jeopardize the launch. A team was assembled to brainstorm things that could impact the mission. This very extensive list was subject to prioritization in terms of likelihood of occurrence. Some items were eliminated due to the very low likelihood of occurrence. Remaining items were assigned a probability of occurrence. Those that had a high probability of occurrence were subject to mitigation plans that could be enabled in the event of an issue. The mitigations included steps that could be implemented in the event the problem occurred. Fortunately, none of the problems occurred and the Cassini Mission proceeded essentially trouble free to a launch on the primary date [the launch was initially scheduled for October 13, 1997 and was delayed 48 hours to October 15 due to a ground problem for Centaur that occurred after Centaur propellant loading].

The original plan called for the mission to last 3-1/2 years after completing the 7-year journey to Saturn. As it happened Cassini flight was so perfectly nominal that there were no mid-course corrections needed. The maneuvering propellant was saved and was available to use on the mission together with spare propellant. This

enabled the mission to be extended for three more years. The mission was subsequently extended again so the total time was 20 years including the time to reach Saturn. Also, the original mission called for Cassini to use the last of the maneuvering propellant to escape Saturn's gravitational field and head for outer space. The plan was subsequently changed so that Cassini would descend through Saturn's atmosphere and burn up. This occurred on September 15, 2017.

Lockheed Martin performed the Cassini Payload Integration. Bob Jaquess was the Payload Integration Mission Manager for NASA Missions including the Cassini Mission. He assembled a Payload Integration Team that had the responsibility to prepare an Integration Control Document (ICD). This document defined the specifications and requirements needed for assuring that the launch vehicle, upper stage and Cassini Spacecraft would be able to interface successfully. The ICD was coordinated and developed with all the primary agencies participating. In addition to the Payload Integration Team there were various Lockheed Martin support groups that became involved. Examples are Loads and Dynamics, Mass Properties, Avionics, and Ground Operations. Members of the integration team interfaced with the various support groups. The Lockheed Martin Payload Integration Team was comprised of Roy Adams-RTG Safety Data Book, Jayson Cowley-Avionics, Chris Garcia-Planner/Scheduler, Pam Lavergne--Budget/Finances, Dr. Robert Lee-RTG Safety Data Book, Dr. Kevin Rudolf-RTG Safety Data Book, Tom Sayuk-Ground Operations, Lynn Zoller-RTG Safety Data Book, and Michael Summerlin who performed oversight at General Dynamics who provided the Centaur Upper Stage at San Diego.

Commentary by Leo Johnson, Mission Manager after the retirement of Bob Jaquess in 1994 (notes taken from the Roundtable discussion):

I had just finished launching a couple of USAF missions and knew what was required and assembled the team. The team worked in the "swamp", as we called it (named after the MASH team) and was extremely close-knit. Becky Bramlage worked ground operations. Conflicting rules from JPL, ESA, USAF, LM were a problem that we dealt with. We had team meetings all day long with LM, NASA, JPL and ESA sorting through the constantly changing rules. At the end near launch, protestors climbed into the pad area. Tough struggle with herding the cats. Technical crew did an outstanding job. We did speak unkindly about the protestors. Also, there were too many press people looking for stories.

Commentary by Monte Kopke, Electrical Systems Manager, Titan Program (notes taken from the Roundtable discussion):

This was the second TIVB vehicle after TIVB-24 [February, 1997, a non-Centaur mission]. We would have received new environments from that flight and were scurrying around to assess those environments. Lots of stuff in was in production. A funny story: Gene Pickett, who did cabling design, always had to get breakfast. There were three or four identical blue Pontiacs at the restaurant, and I picked the wrong one when we came out; guess that was the popular model at the rental car agency. Oh, and there was a lot of concern about the radiation environments, and I re-looked at the assessment. I'm also pretty sure that was the last vehicle with a full-blown sneak circuit analysis. JPL was concerned because the launch was during a Van Allen belt radiation maximum period and asked for the analysis.

Commentary by Jayson Cowley, Avionics Design & Payload Integration. Jason provided written notes summarizing Avionics, Mission Design, Ground Mechanical, and Ground Operations with inputs from Tom Sayuk:

Tom Sayuk:
Avionics:

- Electromagnetic Interference/Contamination was a significant concern due to the spacecraft instrument sensitivity. Mapping of permanent magnetic fields within the site processing facility were mapped and all tools had to be de-gaussed before being used within 5 meters of the spacecraft.
- Titan IV had very limited spacecraft data pass-through capability during ascent. Tailoring of data pages was used to optimize options.
- The capability to pass commands to the spacecraft was even more limited, essentially via 4 discrete (0 versus 28 volt) commands normally used for powering payload functions.
- These discrete commands were used, among other things, to send the "Bad News" command. This alerted the spacecraft flight software in the event that separation from Centaur had not been detected as planned. This was to be used by the spacecraft for contingency actions since uplink commands under these conditions could not be guaranteed.

Mission Design:

- As the first NASA flight of the upgraded SRMU, adequate and accurate performance estimates were a significant concern. This resulted in recurring test data deliveries as well as an extensive (and sometimes contentious) series of trajectory simulation shootouts between the NASA Lewis and Lockheed analysis teams.
- The interplanetary trajectory required that the spacecraft be placed into a static, heliocentric, and very narrow window of position and velocity

regardless of the launch day or launch time. To meet the high energy and stringent target, a continuously-variable flight azimuth design was proposed. Ultimately, this proved too complex to design and verify in conjunction with the normal wind loads reduction steering. A compromise was to build separate trajectories for the open, middle, and close of the launch window for each day of the launch period. While a normal, earth-orbiting mission would design and verify two or three trajectories for a launch, Cassini required hundreds. This meant that each day the wind balloon data would be used to shape the trajectory for the appropriate window segment, be test-run in a ground simulation for verification, and then uploaded to the vehicle in a time-critical sequence.

Ground Mechanical:

- Cassini was a small spacecraft relative to the minimum size TIV-B payload fairing, which increases the severity of acoustic loads. To characterize and minimize the ascent vibro-acoustic environment, a series of tests at the Lockheed-Martin chamber were conducted. This provided empirical model information to design the fairing blanket thickness and coverage (see photo).



Acoustic Test of Cassini Model
Photo Credit: Provided by Jason Cowley

Ground Operations:

- The Cassini RTGs generated a lot of heat inside the insulated payload fairing that needed to be balanced to keep the rest of the instruments cool until exposed in space. A triple-redundant cooling system

with independent cooling controls had to be designed to cut-over within 5 seconds of a failure.

- A major launch timeline driver was the installation of 3 RTGs late in launch site integration flow. Design of ground mechanical systems minimized the processing time and worker radiation exposure while meeting all safety requirements. Multiple installation rehearsals were conducted to ensure team members were trained properly.
- Once Cassini was stacked on the Titan IV and the HVAC connected, a significant design flaw was revealed. The spot-cooling flow intended for the RTGs was too high and resulted in tears in the spacecraft insulation. Repair and replacement of these one-of-a-kind blankets had to be completed on a short timeline to prevent delay of the mission.

One additional observation I can make was about the team "*esprit de corps*." Over the many years of development, the JPL, Centaur and Titan TIV teams developed a wonderful working relationship. When meetings were held at the Cape, we would set up potluck dinners at the Cape Winds and have a fantastic time. Many of us look back and consider Cassini the highlight of our careers for this reason.

Commentary by Keith Hamlyn, Propulsion Module Systems Engineer, Cassini Main Engine Assembly. Keith provided an informative presentation about the Cassini propulsion system, which was used in an AIAA conference, with additional comments from the Roundtable notes:

Originally, the spacecraft propulsion system was going to be provided by the ESA. It came back to JPL and Martin Marietta was in competition with Lockheed and RCA and won the proposal. The Main Engine Assembly (MEA) is described as follows:

- The MEA function was to provide directed thrust for the delta-V maneuvers and for Saturn Orbit Insertion (SOI)
- The MEA consisted for two gimbaled "block redundant" Rocket Engine Assembly (REA) platforms that are pointed by a pair of Engine Gimbal Actuators
 - REAs can be moved in a 11.5-degree half-angle cone to ensure their thrust vector is pointed through spacecraft center of mass
 - Kaiser-Marquardt build the R-4D 100 lbf REA (now part of Aerojet-Redmond)
 - Titanium flex lines were required to feed MMH (Monomethylhydrazine) and NTO (Nitrogen Tetroxide) into the REAs
- REAs included pressure transducers and filters in each propellant leg
- Qualification temperature limits were -5 to 55 degrees C
- Tank pressures varied between 170 to 330 psia

A full-scale qualification unit was brought to White Sands NASA Test Facility in New Mexico. The qualification test was intended to verify at least twice operating life for the REAs, gimbals and other components at simulated flight conditions. During the testing a rough combustion phenomena was noted at a 260-300 Hz resonance that created disturbances of up to 10g on the REA mounting plate. Low temperature and fully saturated propellants along with low fuel valve inlet pressures were contributors to this "chugging" phenomena. This occurs when the MEA feed system resonant frequencies couple with an engine frequency from a combustion delay. An extensive analysis led to the implementation of two modifications:

- Removal of the MEA filters
- Tuned-coupled feedlines (detune the resonance response)

A welded version of the modes was implemented on the Qual MEA and a series of tests were run to verify the performance. It should be noted that NO chugging was observed during any of the burns during actual operation of the MEA on Cassini. Two lessons learned from this experience:

- 1) With the complexity of large propulsion systems there is no substitute for a full-up firing test to confirm the system performance is as expected,
- 2) As always, there were many involved in the successful resolution of this test issue, particularly NASA WSTF and JPL.



Cassini Main Engine Assembly
Photo Credit: Provided by Keith Hamlyn

Commentary By Mark Edson, Booster Vehicle Integrity Testing:

The booster vehicle, K-33, was late to the integrity testing process, putting pressure on the test team. Hook-up would take two weeks around the clock with over 400 connectors in Stage II alone. The Booster Integrity Test (BIT) used a Hughes Analyzer at 1500 VDC. There were concerns for shield integrity and retest was required after four weeks of fixing errors. The connectors were capped and stowed and there were no

failures during single point ground test, a rarity. There were also no significant unverified failures that I recall. In light of successive vehicles with significant harness defects (TIVB-25 and TIVA-20, which was a flight failure due to a wiring short to structure), this was a clean vehicle, with minimal wiring errors.

Commentary by Barb Sande, Titan Systems Mission Success Lead:

I requested to be the launch support person for this vehicle, which was easily accommodated when my first boss, Todd Fenimore, was sent to VAFB to support the processing of TIVA-18 and Todd's boss, Larry Young, was asked to be an expert witness in a trial trying to stop the launch in Hawaii. We talked a little bit about the protestors at the Roundtable, but they were significant nuisances hanging out at the gates and disrupting operations and yelling at people going in the gates. There were concerns on their part that the mission would fail and the RTGs would spread radioactivity all over Florida (or worse). They sued to stop the launch in the Ninth Circuit Court and requested the hearing be held in Hawaii. Larry was part of that hearing, and everyone was relieved when the court threw out the lawsuit. At the same time, we were trying to process a TIVA vehicle (TIVA-18) at VAFB, which was delayed from August, 1997, due to a problem with flow control valves on the Thrust Vector Control system on the SRMs (they actually released N₂O₄ on the pad). Another vehicle, TIVA-17, was also in work at the Cape. The three vehicles (TIVA-18, TIVB-33, TIVA-17) launched within 30 days of each other, becoming a "hat trick" that resulted in a great party when we got home.

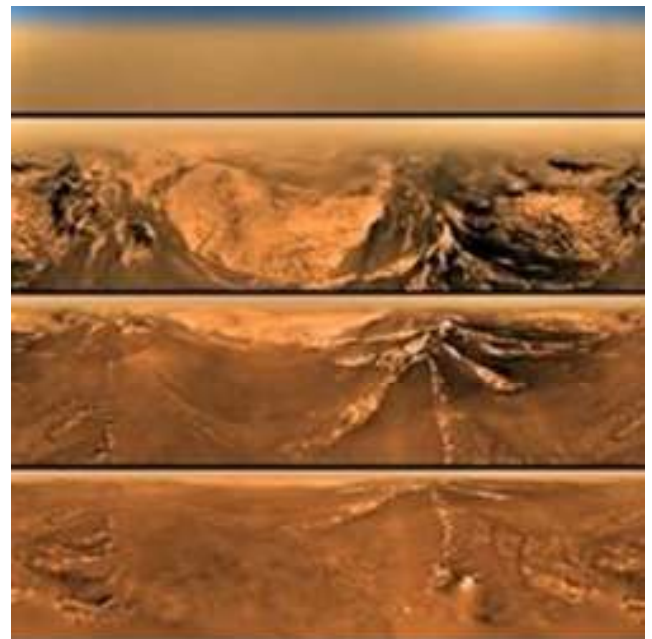
I was busy attending lots of worry meetings and status updates at the Cape and also helped with a 20 AH battery analysis after it failed activation. The machine shop room at the Cape was full of high-level NASA and USAF personnel watching some poor tech working on the battery breakdown (the usual foreign debris found between plates). Upper-level management didn't show up until the day before the first launch attempt on October 13 (delayed until October 15 because of a Centaur ground problem) because of the attempt to fly TIVA-18 at VAFB. We were told not to wear any of the Cassini souvenir clothing because of the protestors nor were we supposed to engage them. I recall having a late dinner at the bar at the Radisson and another person at the bar started screaming about how we were all going to die when Cassini launched. It took all of my self-control to get up and walk out; a veteran reporter with the BBC stayed and challenged this protestor's assertions. Needless to say, everything went great on a beautiful night for the launch and NASA and JPL were very happy with the booster and Centaur performance. It was fortunate that we launched when we did, because we lost three in a row starting the next year, in August, 1998.

A Final Tribute to Cassini

The Roundtable was a fun way to bring back memories of this fantastic event that happened to be a career highlight for many at LM. What better way to remember this mission than with a few stunning photos:



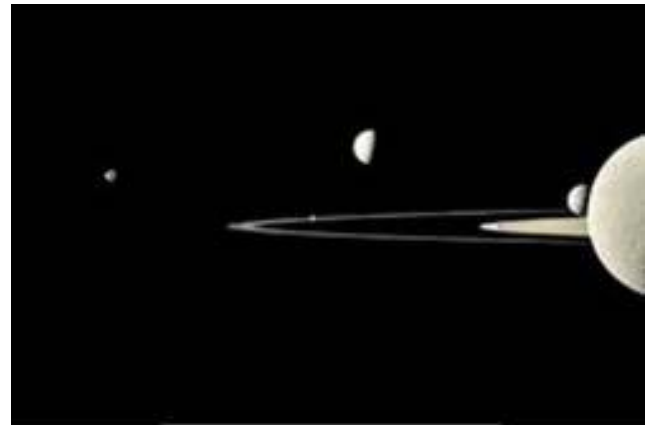
Titan IVB-33/Titan Centaur TC-20 Launch
Payload: Cassini/Huygens to Saturn
October 15, 1997
Photo Credit: NASA/JPL/ESA



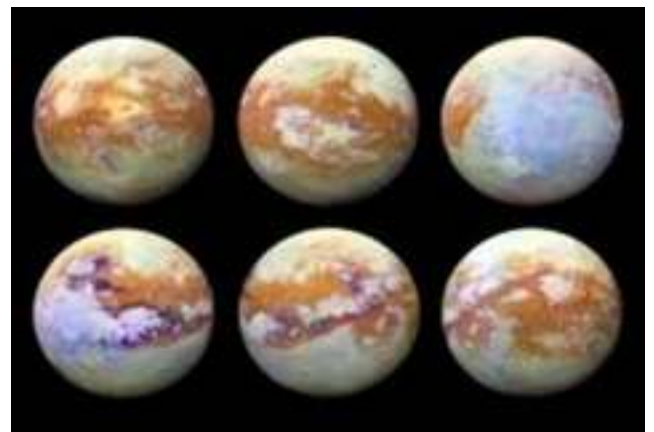
Descent Photos Taken from the Huygens
Probe of the Saturnian Moon Titan
Photo Credit: ESA



The Rings of Saturn
Photo Credit: NASA/JPL/ESA



Five Moons and the
Rings of Saturn
Photo Credit: NASA/JPL/ESA



Infrared Imaging of Titan
Photo Credit: NASA/JPL/ESA



Enceladus, A Mysterious Moon
with an Interior Ocean
Photo Credit: NASA/JPL/ESA



The Glorious Ringed Planet Saturn
Photo Credit: NASA/JPL/ESA

Resources and Links

Cassini at Saturn

https://www.nasa.gov/mission_pages/cassini/main/index.html

Cassini Overview

<https://solarsystem.nasa.gov/missions/cassini/overview/>

General and Supporting Information

<https://en.wikipedia.org/wiki/Cassini-Huygens>

Video: Last Look at Saturn

<https://www.youtube.com/watch?v=5ZrSKpbdSg>

Last Fly-by of Titan

<https://www.nasa.gov/feature/jpl/cassini-completes-final-and-fateful-titan-flyby>

Link to Roundtable Discussion on YouTube

<https://bit.ly/MARSCASSINI>

Next Edition

In the next MARS STAR, I will profile the final Apollo lunar mission, Apollo 17. In 2023, look for articles about Skylab 1 (Skylab launch) & 2 (first lab crew), Mercury/Atlas 7-9 missions, and Skylab 3 & 4 (second and third crews).

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

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 normally 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 21 October, 18 November and 16 December.

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. There is a small fee for the Buck Center, as well as a small fee to the club (which helps with supplies and the year-end Holiday party). This year the Holiday Party will be held separately at a local venue.

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

This quarter we welcome our newest players, **George Eger, MJ Erickson-Eger, & Keith Hamlyn.** There is still room for more players, as the room will accommodate 8 tables.

Now is the time to join us as the snowbirds are leaving for warmer destinations. 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 3rd Quarter 2022 winners are as follows:

15 July (6 tables)

N-S 1st – Mike Davis & Mary Stirling

2nd – Ernie & Cecile Berliner

E-W 1st – Leo Johnson & Joni Rosenberg

2nd – Curt & Phyllis Brudos

26 August (4 tables)

1st – Mark & Jan Ugale

2nd – Ernie & Cecile Berliner

3rd – Betty Hirst & Wayne Jackson

tied with Dave & Kathy Martz

16 September (4 tables)

1st – Ernie & Cecile Berliner

2nd – Mike Davis & Mary Stirling

3rd – Dave Martz & Bill Kacena

4th – Curt & Phyllis Brudos

Car Club

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

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

Greetings MARS members and fellow Car Clubbers! Hope you have taken your "Baby" out for a spin and have been enjoying all the beauty Colorado has to offer! Even with the price of gas there are so many things to go do and see, many of which are nearby.

The annual car show, held in conjunction with the MARS Picnic, was a big success! Over 21 cars participated, and their entrance "fee" will make for a very nice donation to the Marine Corps Toys for Tots program, thank you to all participants!

The club also got together and toured the Cussler Museum. The Cussler Museum is dedicated to the preservation of astounding rare and vintage automobiles from all over the world, and it's here in Arvada!



Car Club Visit to the Cussler Museum, Arvada, CO

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

Since our last report we have had three more luncheons. We started at Café Jordano in July, followed by Imperial Chinese in August, and we then finished off the quarter at Black-Eyed Pea in September.

Our last event for the year will be at Maggiano's in Englewood on October 31st.

On a different note, we have decided that we need to stop doing this full-time by the end of the year. With everything that has occurred over the last 2 years, we are really burned out. Consequently, we are looking for someone to take over the Dining Club, whether full-time or part-time. It would involve deciding on restaurants, scheduling them, and collecting the money. If you, or anyone you know, is interested, feel free to email us or contact either Dick Sosnay or Ken Marts. Their contact information is on the MARS website and on the inside cover of this STAR.

Golf League



By Bo Rodriguez
(boandpat@comcast.net)

Sandy Mossman
(smoss5592@gmail.com)

Another favorable MARS golf league season is nearing its completion at the end of October. As we have in recent years, all our golf league events have been played at Broken Tee Golf Course in Englewood, Colorado. All-in-all we have had good weather throughout the golf season with only one cancellation due to cold weather.

We had our annual two-day league championship tournament on August 18th and August 25th at Broken Tee. The combined net score of the two rounds determined the overall winners as:

- 1st place – Greg Palmer - net score 138
- 2nd place – Dave Boggy - net score 144
- 3rd place – Don Marquet - net score 145
- 4th place – Don Johnson - net score 148
- 5th place – Kathryn Hetzel - net score 149*
- 6th place – Jayne Brown - net score 149*

*Last nine holes on 2nd day score
determines tie breaker.

Closest to the pin:

August 18th – hole #5 – Paul Betthauser
hole #7 – Ken Baier
hole #10 – Ken McDowell
hole #17 – Loren Schuessler
August 25th – hole #5 – Steve Vinland
hole #7 – Bill Fulkerson
hole #10 – Terry Graber
hole #17 – Don Johnson

Medalist Winners – Dan Brown with the lowest gross
score of 167

A picnic was held on the last day of the tournament at
the River Run Pavillion next to the course. It was well
attended and a fun event for all. Prizes were awarded
at that time.

This year there were no hole-in-ones made thus far in
league play. Therefore, our hole-in-one pool is up to
\$280. League members must pay \$5 into the hole-in-
one pool in order to win the total sum.

We want to give thanks and appreciation to several of
our members who volunteered their time as co-chairs for
each event to make this season a success. Special
thanks to Tom Ripper for orchestrating the use of the
Golf Genius system for scheduling tee times and posting
golf scores for our league. Tom also served as one of
the Event Managers along with Terry Graber, Bob
Knickerbocker, Ken McDowell, Andy Muñoz and Kathy
Rieger in managing the weekly scheduling and scoring
activity. Thanks also to Don Johnson, our Treasurer, for
managing our banking account.

For those MARS Associate members that are interested
in joining our golf league next season, please check into
our MARS website: <https://www.marsretirees.org> and
click on "GOLF" in the clubs listing section. Each year in
March the MARS golf league has its Kick-off Meeting.
The announcement for next year's event will be noted in
the January issue of the MARS STAR.

Best Regards,
Bo & Sandy



Photography Club

By John Chapter

johnchapter@msn.com

303-986-8277

The MARS Photo-Club did not meet June, July, and August 2022. It is our summer break and many club members are travelling.

We had a September 2022 meeting in which we presented a standard club-member competition that was judged by BJ Anthony. The first-place image, *Notre Dame Pieta*, was by club member Rick Price. Please visit our Photography Club webpage for the other winning images (<https://www.marsretirees.org/>).

Our program for September was by guest speaker Joe Bonita, an acquaintance of Maris Biela. He is a member of the Highland Ranch Photography Club. His presentation on *Photographic Composition* was well received by all.

The October 2022 Photo-Club meeting will be our first *Live Zoom* meeting. It will be held at the Columbine Library located on South Bowles, just off Wadsworth Blvd. The meeting room has a large online screen that will project the meeting for those attending in person, as well as those attending via Zoom. We hope this meeting format will become our standard approach.

John Chapter and Jim Kummer

Colorado Springs Lockheed Martin Retiree Group News

By Doug Tomerlin

dougincs@aol.com

The Colorado Springs retiree group held a luncheon on October 6 at Cheddars Scratch Kitchen. Officers from MARS Associates attended and discussed the benefits of Colorado Springs Lockheed Martin retirees joining MARS Associates.

We were sad to hear that two retirees passed away since the last newsletter: William "Bill" Kettleborough and George Mineah. Both passed away in June. Our deepest condolences go to their family and friends.

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

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

olson5145@aol.com

Luncheons

August 2022 – Little better turnout this month. Joining us was Sherry Gunn, Bill Rhode's cousin, who is here for Bill's services and to settle his estate and several people brought pictures of Bill and friends to share with her. Also present were regulars Wendell McDaniels, Abe Smith, Roger Wright, Don Bollinger, Ken Webb, Cecil Snipes, Bob Rodamer, LaVern Jones and a few we haven't seen for a while: Darrell Laws, Bill Reinhold and Rick Snedecker along with his daughter Karla and her friend Jackie. It was a lively bunch.

Roger reported that Lynn Johnson has fallen and suffered a broken hip. She is in the hospital but hopes to be released in a couple days.

It is a busy day for the ITL and the old Titan launch pads. ULA launched an Atlas from CX41 this morning and SpaceX is to launch from CX40 this evening. I don't think there were ever two launches from the ITL on the same day as far as I can remember. We did launch the two Vikings and two Voyager missions from the same pad, CX41, within 10 days. Had a vehicle on the pad with umbilicals connected the same day we launched.

September 2022 – A really light turnout this month. Everyone must be getting ready for Labor Day. Present were regulars Jimmy Weddle, Don Bollinger, Abe Smith, LaVerne Jones and Bob Matschner (who is back after a summer in the Keys).

NASA is going to try the Artemis launch again Saturday. We wish them a successful launch.

October 2022 –

Pretty good turnout. Present were regulars Abe Smith, Bob Rodamer, Don Bollinger, Lavern Jones and Bob Matschner along with some folks we haven't seen for a while. Ben Duesenberry was here from New Mexico, Larry Gleason and his son Lon, Sylvia Sansing, Lynn Johnson, Cathy Klein and Dave Kintigh. Lots of catching up took place.

Stopped in at Beef O Brady's where the other Titan group meets on Thursday and there was a good turnout and Benny bought the first round. Present were Karen and Jerry Jamison, Dan and Kelly DeFasio, Norm White, Bob Rodamer, Rick Snedecker, Abe Smith and his wife to name a few and a bunch whose names I couldn't recall.

Again, lots of catching up and Titan war stories. Good time was had by all.

Recent Obituaries

Terry Lee Tolbert, 71, passed away on 9 July. Terry was another of our Titan Team members.

Ron Frisbee, 82, passed away on 23 July. Ron worked in Operations and had a joke for every occasion.

William E. (Bill) Rohde, 79, passed on 23 July. Bill worked in Materiel on the Cape Titan Team and was a faithful attendee to our retiree luncheon arriving on his motorcycle and in later years his trike bike.

Lockheed Martin (LM) News

Lockheed Martin Declares Fourth Quarter 2022 Dividend

BETHESDA, Md., Sept. 30, 2022 /PRNewswire/ -- The Lockheed Martin Corporation (NYSE: LMT) board of directors has authorized a fourth quarter 2022 dividend of \$3.00 per share, representing an increase of \$0.20 per share over last quarter. The dividend is payable on Dec. 30, 2022, to holders of record as of the close of business on Dec. 1, 2022.

Lockheed Martin, Verizon Demonstrate 5G-Powered ISR Capabilities For Department Of Defense

Technology will enhance DOD command and control, signal processing capabilities

The Big Picture

In recent demonstrations, Lockheed Martin and Verizon flew 5G-enabled drones to capture and securely transfer high-speed, real-time intelligence, surveillance and reconnaissance (ISR) data from aircraft in flight to geolocate military targets.

The companies demonstrated two key advances in technology that can provide critical applications for the Department of Defense (DOD):

- First, real-time ISR radio frequency (RF) and streaming video data was transmitted over 5G millimeter wave links to allow advanced signal processing algorithms to be executed at the tactical edge. The data was displayed in a livestream video feed. This capability will provide enhanced levels of situational awareness and command & control (C2) for commanders and service members in the field.

- Second, the technology passively detected and geolocated RF signals that could be used for communications, sensing, or jamming. This will enable the DOD to detect and target adversarial assets in a military environment.

What People Are Saying

Dan Rice, vice president of 5G.MIL Programs at Lockheed Martin:

"To stay ahead of our adversaries, military decision-makers need the timely and accurate information that 5G.MIL delivered in this demonstration. By blending advanced commercial 5G capabilities with military capabilities using secure, open standards, we are helping to make the DOD's vision for integrated deterrence a reality."

Srini Kalapala, senior vice president for Technology and Product Development at Verizon:

"Verizon is the network America relies on, and our Private 5G Ultra Wideband networks provide the security, reliability, capacity and low latency that the defense sector depends on. By demonstrating the mission critical connectivity that our network provides, we are demonstrating how 5G and edge computing can help the DOD address their strategic priorities and continue to develop advanced solutions."

The Details

- **The Basic Set-Up:** Four 5G-enabled rotary wing drones flew coordinated ISR missions while linked to two Verizon On Site Private Network nodes – the technology that enabled the secure transfer of ISR data. The test occurred at Lockheed Martin's 5G test range in Waterton, Colorado.
- **Command and Control:** The companies seamlessly and securely moved the data captured by the drones between a 5G private network and a surrogate public network. The ability to use both private and public 5G networks is key – it will extend the reach of 5G.MIL technology to a range of military environments where commercial networks may not be available or appropriate.
- **Signal Detection Capabilities:** The drones successfully located a target in the field that was transmitting a low power RF signal. The signal was detected because real-time drone sensing data was transmitted over a private Verizon high-speed, low-latency 5G Ultra Wideband network and then processed by advanced signal processing algorithms running on edge compute resources, enabling geolocation of the signal source.

How:

- The low latency, high throughput and solid reliability provided by the Verizon network enabled the

companies to transmit and process the ISR data in near real-time.

- Lockheed Martin's multi-site, multi-vendor 5G.MIL pilot network enabled the data to be securely transferred to other locations to view the ISR data and common operating picture.

Why:

- These demonstrations, held in May and September 2022, are part of an ongoing 5G collaboration announced by the companies last year focused on faster delivery of cutting-edge technologies to the DOD.
- The deployment of private 5G is a strategic priority for Verizon. The company's continued investment in the sector is enabling these types of demonstrations.
- Commercial company collaborations like this are part of Lockheed Martin's 21st Century Security vision to accelerate the delivery of cutting-edge technologies to U.S. military customers.

What's Next?

Future demonstrations between Verizon and Lockheed Martin are expected to expand ISR test scenarios to include precision geolocation of moving RF emitters. The companies plan to extend public-private network collaboration securely using 5G.MIL hybrid networks with military data links.

United Launch Alliance (ULA) News

United Launch Alliance Successfully Launches Two Key SES Commercial C-band Satellites

Atlas V launched SES-20 and SES-21 to deliver TV, radio and critical data transmission services in support of the FCC's 5G national transition

Cape Canaveral Space Force Station, Fla., (Oct. 5, 2022) – A United Launch Alliance (ULA) Atlas V rocket carrying the SES-20 and SES-21 satellites in a dual-satellite configuration lifted off on Oct. 4 at 5:36 p.m. EDT from Space Launch Complex-41 at Cape Canaveral Space Force Station. To date ULA has launched 154 times with 100 percent mission success.

"We're excited to support our commercial partner SES in their C-band transition efforts to meet the FCC's objective to deploy 5G service across the U.S. Their mission aligns with our mission to connect the world and these capabilities will enable uninterrupted commercial services to many Americans," said Gary Wentz, ULA vice president of Government and Commercial Programs. "The Atlas V delivered the satellites accurately to a near-

geosynchronous orbit 22,300 miles (35,888 km) above the equator. Thank you to the ULA team and our partners for ensuring the successful delivery of this multi-payload mission to orbit."

The Boeing-built C-band satellites, launched on an Atlas V 531 configuration rocket, will enable SES to continue providing critical data and TV transmission services to nearly 120 million American homes. The launch of SES-20 and SES-21 is part of a broader Federal Communications Commission (FCC) program to clear a portion of C-band spectrum to enable wireless operators to deploy 5G services across the contiguous US (CONUS). This was the 96th launch of the Atlas V rocket, the 80th Atlas V launch from SLC-41 and the 107th launch from SLC-41.

ULA's next launch is the Joint Polar Satellite System (JPSS)-2 civilian polar-orbiting weather mission for the National Oceanic Atmospheric Administration (NOAA) and NASA and NASA's Low-Earth Orbit Flight Test of an Inflatable Decelerator (LOFTID). The launch is planned for Nov. 1 from Space Launch Complex-3 at Vandenberg Space Force Base, California.

Leveraging a legacy of 100 percent mission success launching more than 150 missions to explore, protect and enhance our world, ULA is the nation's most experienced and reliable launch service provider with world-leading reliability, schedule confidence, and mission optimization. We deliver value unmatched by any launch services company in the industry, a tireless drive to improve, and commitment to the extraordinary.

ATLAS V TO LAUNCH JPSS-2

A United Launch Alliance (ULA) Atlas V 401 rocket will launch the Joint Polar Satellite (JPSS)-2 civilian polar-orbiting weather satellite for the National Oceanic and Atmospheric Administration (NOAA) and NASA and NASA's Low-Earth Orbit Flight Test of an Inflatable Decelerator (LOFTID). Liftoff will occur from Space Launch Complex-3 at Vandenberg Space Force Base, California.

Launch Date and Time: November 1, 2022 at 2:25 a.m. PDT (5:25 a.m. EDT; 0925 UTC)

Go Atlas! Go Centaur! Go JPSS-2!



MARS Associates

2022 Holiday Celebration Luncheon

The Officers and Directors of MARS Associates invite you to join the 2022 Holiday Celebration on **WEDNESDAY, December 7, 2022, at The Wellshire Event Center**, 3333 South Colorado Boulevard, Denver, Colorado. This year we are offering you the choice of Grilled Flat Iron Steak marinated in red wine, fresh garlic, rosemary and chives; Lemon Grilled Chicken; or, Sweet Chili Atlantic Salmon served with Sweet Chili Sauce. Lunch will include a field green salad with red wine vinaigrette, fresh homemade bread with butter, Holiday Green Beans, Roasted Red Potatoes and Wellshire's Sweet Table Dessert. Coffee and tea will also be provided.

The "cash" bar will open at 11:00 a.m. Lunch will be served at 12:00 noon. Please note that the Wellshire Event Center does NOT accept cash; **credit or debit cards only**, please!

The cost for members and one guest is \$40.00 per person. The cost for additional guests or non-members is \$65.00 per person. These prices include taxes and gratuities. Please specify your choice of entrée(s) on the reservation form below and mail it with your check (made payable to **MARS Associates**) to the address on the form below by November 22, 2022. Or, you can make your reservation by using the STRIPE link below:

STRIPE (ctrl+click): <https://form.jotform.com/222725952489064>

Reservations must be received by **November 22, 2022**.

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

If you make a reservation and later find you cannot attend, please notify Linda Duby at 303-249-1665 or lindaduby@comcast.net; or Charlie Haupt at 303-725-7595 or qcrfcoach@gmail.com; or Carl Kaminski at 303-726-1546 or carlkc06@gmail.com no later than **November 22, 2022** to receive a refund. Admission is by reservation only.

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

Holiday Celebration - December 7, 2022. Please print clearly.
Mail to: **MARS Associates, PO Box 1128, Littleton, CO 80160-1128**

Member: _____	Beef _____ \$40.00	Salmon _____ \$40.00	Chicken _____ \$40.00
Spouse/Companion/Guest: _____	Beef _____ \$40.00	Salmon _____ \$40.00	Chicken _____ \$40.00
Other Guests: _____	Beef _____ \$65.00	Salmon _____ \$65.00	Chicken _____ \$65.00

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

Member e-mail address _____

Member/Spouse/Companion/Guest ____ @ \$40.00/person = \$ _____ Other guests @ \$65.00/person = \$ _____

TOTAL ENCLOSED \$ _____ Check # _____

Wellshire Event Center, 3333 South Colorado Boulevard, Denver





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JANUARY 7-22, 2023

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				5 NWSS Kick-Off Parade Downtown Denver 12pm		7 CO - The World Rodeo 11am - 3:30pm, 8pm Rancho Rodeo 5:30pm
8 Mexican Rodeo 2pm, 6:30pm Freestyle Training 7pm	9 PBR Bull Riding 7pm	10 PBR Bull Riding 7pm	11 PBR Bull Riding Finals - 7pm	12 Pink Pro Rodeo 7pm	13 Pro Rodeo 1:30pm, 8pm Gambler's Choice 7:30pm	14 Pro Rodeo 11am, 3:30pm, 8pm Wild West Show 5pm
15 Pro Rodeo 2pm, 6:30pm Wild West Show 8pm	16 Pro Rodeo - 1pm Xtreme Dogs - 3pm MLK Rodeo - 4pm Grand Prix - 7pm	17 Xtreme Dogs 6:30pm Pro Rodeo 7pm	18 Pro Rodeo 7:30pm, 7pm An Evening of Dancing Horses 7pm	19 Pro Rodeo 1:30pm, 7pm An Evening of Dancing Horses 7pm	20 Pro Rodeo 1:30pm - 6pm Draft Horse Show 7pm	21 Pro Rodeo 11am, 3:30pm, 8pm Draft Horse Show 1pm, 6pm
22 Draft Horse Show 1pm Pro Rodeo Finals 2pm	23 CAVENDER'S Family 4-Pack starting at \$88 4 Tickets, Hot Dogs, Bags of Chips & Sodas plus \$25 OFF \$100 Cavender's purchase			26 Boots Night Out starting at \$52 2 Tickets & 2 Beverages (Coke or Sodas)		

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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 [lowers 2022 revenue outlook](#) on charges, F-35 headwinds (Reuters)

Lockheed Martin shows candor about today's [supply chain challenges](#) (Washington Technology)

[Lack of workers is hurting supply chain](#) more than COVID, defense execs say (Defense One)

Biden presses for [chips legislation](#) in meeting with Pentagon's No. 2 and Lockheed Martin (Defense News)

HIMARS-maker [Lockheed Martin "confident" against Russian hackers](#) (Newsweek)

In annual Defense News ranking, [Lockheed Martin retains top position](#) for 23rd year (Defense News)

Lockheed Martin [doubles ventures fund](#) as it hunts for future tech startups (Defense One)

[Lockheed Martin invests in Xona's](#) GPS-alternative constellation (Space News)

Lockheed Martin [venture fund to increase investments in space](#) companies (Space News)

Booz Allen says acquisition of cyber firm [aimed at Lockheed Martin, Raytheon](#) (Defense News)

Retired USMC Lt. Gen. Vincent Stewart [elected to Lockheed Martin board](#) (GovConWire)

[Connecticut native tasked with leading the finances](#) of nation's largest defense conglomerate (CT Insider)

[Tim Cahill named](#) Missiles & Fire Control executive vice president (WashingtonExec.com)

Lockheed Martin to receive up to [\\$77 million in tax breaks](#) through 2048 (Atlanta Journal-Constitution)

HYPERSONICS NEWS

Raytheon beats Lockheed Martin, Boeing for [\\$1 billion hypersonic cruise missile](#) (Bloomberg News)

[First live rounds of Army's hypersonic weapon](#) coming in "roughly" six months (Breaking Defense)

Lockheed Martin [ARRW hypersonic weapon moves to next phase](#) after U.S. Air Force test success (Defense News)

Successful HAWC test doesn't end [DARPA's hypersonic scramjet efforts](#) (Air Force Magazine)

5G.MIL NEWS

Lockheed Martin, Verizon testing [5G-linked drone swarm for intel collection](#) (C4ISTNet)

Lockheed Martin, AT&T [accelerate Black Hawk data transfer using 5G](#) networks (Defense News)

[Remember 5G?](#) Pentagon backs 6G hub tied to Army Research Lab (Defense News)

SPACE SYSTEMS NEWS

DoD to [end procurement of geosynchronous missile-warning satellites](#) (Space News)

Lockheed Martin, Maxar win [weather satellite contracts](#) (Space News)

Lockheed Martin to launch [space-based testbed](#) for joint all-domain operations (Defense News)

Lockheed Martin military space boss sees ["opportunity to expand beyond" GPS](#) (Air Force Magazine)

Bay Area built: How [our camera helped capture Webb Space Telescope's famed first images](#) (Mercury-News)

Lockheed Martin, Goodyear, GM develop [new lunar rover](#) as NASA moon missions advance (NBC5 News/Dallas-Fort Worth)

NASA requests proposals for [second Artemis crewed lander](#) (Space News)

Lockheed Martin sees a [space future for Australia](#) (Australian Defence Magazine)

Rocket carrying new nuclear missile component [explodes in late-night test](#) (Defense News)

Draft solicitation for [national security space launch services](#) expected in early 2023 (Space News)

ULA [launches the last SBIRS](#) U.S. Space Force missile warning satellite (Space News)

ULA's [Atlas 5 launches](#) U.S. Space Force experimental missile-warning satellite (Space News)

NRO satellite flies to orbit in [Delta 4's final West Coast launch](#) (Space News)

SpaceX cleared to loft U.S. spy satellites using reusable boosters, may gain a temporary [edge over Boeing-Lockheed Martin team](#) (Bloomberg News)

VP Harris announced [partnership to promote space careers](#) (Washington Times)

AERONAUTICS NEWS

U.S. Air Force picks [Lockheed Martin, four others to develop next-gen engines](#) (Defense News)

Lockheed Martin working on [advanced, expendable drones](#) to team up with U.S. Air Force fighters (Defense News)

Lockheed Martin [investing \\$100 million in fighter-controlled drones](#) (Breaking Defense)

U.S. Air Force's [6th-generation fighter downselect](#) "not all that far away," Kendall says (Breaking Defense)

[F-35 deliveries halted](#) overuse of Chinese alloy, Pentagon says (Bloomberg News)

Lockheed Martin touts handshake deal with Pentagon for [next three lots of F-35s](#) (Defense News)

Lockheed Martin's next [F-35 jet contract is expected to be worth \\$30 billion](#) (Bloomberg News)

Troubled [F-35 risks more groundings](#) on lack of working engines (Bloomberg News)

U.S. Air Force [clears most F-35 fighter jets to fly](#) after two-week grounding (Bloomberg News)

Lockheed Martin [F-35's factory flaws persist](#) even after 800 are built (Bloomberg News)

Lockheed Martin says [F-35 sustainment costs have fallen by half](#), with another 35% coming (Air Force Magazine)

Construction of the [first two Belgian F-35s](#) under way in Italy (The Brussels Times)

[Swiss leaders sign \\$6.25 billion contract](#) for F-35 fighter jets (Defense News)

Greece proceeds with [purchase of 20 F-35 fighter jets](#) (Reuters)

Singapore reveals it might choose a [different F-35 variant](#) (Defense News)

[Czech Republic selects F-35](#) as next fighter jet (Defense News)

South Korean defense agency backs [buy of 20 more F-35A jets](#) (Defense News)

U.S. State Department approves [\\$8.4 billion F-35 sale to Germany](#) (Defense News)

Italy [F-35 maintenance hub opens for international customers](#) with Norwegian jet (Defense News)

U.S. State Department OKs possible [sale of F-16 equipment to Pakistan](#) (Reuters)

[Bulgaria inches closer to buying more F-16s](#) to replace Russian jets (Reuters)

Have plane, will fly: [Lockheed Martin's chief test](#) pilot living the dream (Vancouver Sun)

Lockheed Martin's [Skunk Works sees value in manned-unmanned teaming](#), autonomous aircraft (Air Force Magazine)

Once top-secret U.S. [stealth plane arrives at Castle Air Museum](#) (Merced Sun-Star)

MISSILES AND FIRE CONTROL NEWS

New Ukraine aid will [buy 18 HIMARS](#) and weapons to "disrupt" drones (Defense News)

U.S. to send [more HIMARS precision rocket systems](#) to Ukraine (Defense News)

U.S. [HIMARS help to hold off Russian advance](#), Ukraine says (Wall Street Journal)

Ukraine says it has [destroyed 50 Russian ammunition depots using HIMARS](#) (Reuters)

[Latvia requests HIMARS](#) weapon to Bolster Baltic defense (Defense News)

Hi, HIMARS: Army goes [barndstorming around Europe with acclaimed rocket system](#) (Stars & Stripes)

Little-known [modified Hellfire missiles](#) likely killed al Qaeda's Zawahiri (Reuters)

[Lockheed Martin looks for suppliers](#) to support missile boom (Aviation Week Network)

U.S. [Army buys 1,800 new Javelins](#) after Ukraine deliveries (The Defense Post)

U.S. Army fires [Javelin anti-tank missile in Japan](#) for first time (Stars & Stripes)

U.S. approves [\\$300 million Javelin missile sale](#) to UK (The Defense Post)

U.S. State Department approves [long-delayed sale of Javelin missiles to Brazil](#) (Reuters)

U.S. Army, Marine Corps declare [Joint Air-to-Ground Missile ready for production](#) (Defense News)

Lockheed Martin delivers [first jet-mounted laser weapon](#) to U.S. Air Force (The Defense Post)

[Lockheed Martin delivers high-energy laser](#), four years in the making, to U.S. Navy (Breaking Defense)

Lockheed Martin delivers [300-kilowatt laser](#) to Defense Department for Army demonstration (Breaking Defense)

Lockheed Martin to integrate M-Code [anti-jam security](#) into JASSM, JASSM-ER, and LRASM missile GPS guidance (Military-Aerospace Electronics)

B-2 bomber [successfully launches JASSM-ER](#) long-range cruise missile (FlightGlobal)

[Germany snubs Lockheed Martin](#), opts for Israeli air defense system (Bloomberg News)

U.S. State Department approves \$2 billion in [arms sales to four countries](#) (Reuters)

ROTARY AND MISSION SYSTEMS NEWS

Combat rescue helicopter [cuts trigger cost overrun](#), Air Force says (Defense News)

U.S. [Air Force rethinks combat rescue](#) for major war – but what will it look like? (Defense News)

Changing [times favor U.S. Army's FLRAA](#) – for now (Aviation Week Network)

Lockheed Martin to provide Australia with [additional MH-60R helicopters](#) (The Defense Post)

DARPA, Sikorsky receive 2022 [Aviation Week Laureate Award](#) for autonomous Black Hawk demonstration (Aviation Week Network)

Lockheed Martin pitches X2 line for [NATO's next-generation helicopter](#) (FlightGlobal)

Coloradans developing state's newest firefighting tool, [transforming a Black Hawk to a Fire Hawk](#) (Stars & Stripes / The Denver Post)

Missile defense exercise off Hawaiian island includes [first live-fire intercept](#) (Stars & Stripes)

Lockheed Martin, General Dynamics win [Army electronic warfare contract](#) (Defense News)

Navy moving ahead on [combining gear fix on Freedom-class ships](#) marked for decommissioning (U.S. Naval Institute News)

U.S. Navy takes [delivery of USS Cooperstown Freedom-class ship](#) (Naval Technology)

[USS Fort Worth is saved, for now](#); another ship to bear the city's name wasn't so lucky (Stars & Stripes)

U.S. Navy taps six firms for [large drone ship concepts](#) (The Defense Post)



LUNCHEON HONORING OUR SENIORS, JULY 13, 2022



Beverly and Carl Warren



Bill Oliver, Fred Luhman



Bill and Lois Heppler



D. Arrell, Sidney Broadbent, J. Arrell



Jim and Ruth Miles



Jan and Stan Hightower



Ron and Maureen Gedeon



Nels and Tess Freeman



Calvin and Sharon Harr



David and Horace Clair



Donna Ericson and Fritz Berns



Frank Toney, Ila Toney



Joe Carroll, Beth King



June and Bob Kittelson



Shirley and Mike Pfister



Peggy Costley, Barbara Costley-Adams



Linda and Clair Haag



Larry Campbell, Bud Stodghill



Karen Paulson, Carol Lovelace



George Dameron and Charyl Rose



(L-R) Stan Hightower, Dick Sosnay, Larry Campbell, Al Nemes, Ralph Dergance, Bart Wright, Bo Rodrigues, Larry Major, Mike Pfister, Bill Oliver, Larry Stearns (seated)

MARS at the Rockies, July 27, 2022



Linda Berry, Ticket Winner!



Mollie Christensen, Ticket Winner!



RJ Jensen, Essie Hatch



Lenette Wallace, Greg Bowman, Cal Bowman



Paula Pinckley, Jill Walker



Thomas & Janice Redfield



Jeff & Lynn Schnackel



Kaz Hellickson & Debbie Baldwin

MARS Associates Annual Picnic, Clement Park, September 14, 2022



Socializing



Two buffet lines for a hungry crowd



Checking out the vendors



Checking out the vendors



Dick Sosnay calls a door prize ticket number



Terry Lillibridge won the electric toothbrush donated by Delta Dental.



Onlookers During Raffle



Charlie Haupt gives Sarah McKinney the gift basket she won, donated by Red Rocks Credit Union



Tom Lisec won a Panera Gift Card
donated by Assured Partners



Charles Pippinger won a cutlery set
donated by Kaiser Permanente Health



Dick Hurley won a \$100 door prize from MARS



John Grace won a \$100 door prize from MARS



Donna O'Neil won a \$200 door prize from MARS



Paul Cline won a \$300 door prize from MARS

For more photos from special activities, the Senior Luncheon, MARS at the Rockies and the Annual Picnic, as well as other events and activities, check out the MARS Associates website marsretirees.org and the MARS Associates Facebook page!

2022 MARS Associates Super Seniors, Ken Caryl Manor House, July 13, 2022



(L-R Standing) Jim Miles, Fritz Berns, Clare Haag, Ron Gedeon, George Dameron, Charlie Class, Mike Davis, Nels Freeman, Bill Cox, Charles Pippinger, Jack Kimpton, Bob Kittelson, Curt Brudos, Joe Carroll, Fred Luhman, Bud Stodghill, Leo Johnson, Sidney Broadbent
(L-R Seated) Horace Clair, Donald West, Hazel Chapman, Mike Kess

Schedule Addendum (See last page)

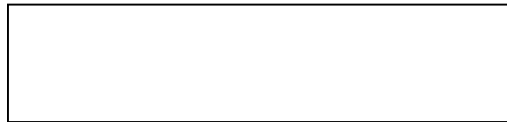
NOTES:

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 (All events are lunch unless otherwise noted): Check website for details
 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 email.
 10. Marketing Committee meets on a monthly basis as determined by members with guests invited (Typically last Thursday)
 - *11. 2022/2023 Happy Hour Dates and Locations are tentative; MARS website will have details when available
 12. 2022 Holiday Celebration - Dec 7, 2022 at Wellshire Events Center
 13. 2023 Annual Meeting is Mar 1, 2023
 14. 2023 Senior Recognition Luncheon - July 12, 2023
 15. 2023 Rockies Game - TBD
 16. 2023 Annual Picnic -Sep 13, 2023 at Clement Park
 17. See MARS website (<https://marsretirees.org>) for additional information on these events.
- Please review dates and times and notify Ken Marts (martshouse2@aol.com) if you have any changes or additions.



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' ADDRESS SERVICE REQUESTED



DATE: October 2022												
EVENT/MONTH	2023											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Officers/Directors	5	2	6	4	1	1	5	3	7	5	2	6
Bridge Club	21	18	16	20	17	17	21	19	16	21	18	15
Car Club	1	5	3	7	4	4	1	6	3	1	5	2
Dinner Club	31	-	-	-	-	-	-	-	-	-	-	-
Golf Club	Thur	-	-	-	-	-	Thur	Thur	Thur	Thur	Thu	Thu
Hiking Club	18	16	21	18	15	15	19	17	21	19	16	20
Photo Club	13	10	8	12	9	9	13	11				14
Web Committee	25	29	27	31	28	28	25	30	27	25	29	26
Marketing Committee	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
MARS Events												
Happy Hour	12			TBD			TBD			TBD		
Holiday Celebration			7									
Annual Meeting						1						
Senior Recognition Luncheon										12		
Annual Rockies Game												TBD
Annual Picnic												13
MARS Special Events												
Estes Park Observatory	3											
MARS STAR Schedule												
Items due for MARS STAR												
STAR Input to Editor	4			5			6			6		
STAR Repro. Deadline	17			16			17			17		
STAR Mailing	26			25			26			26		