



Volume 31, Issue 2  
April 2015

*Sponsored by LOCKHEED MARTIN*

# MARS STAR



## **MARS Activities This Quarter:**

**Colorado Rockies Game**

**June 10, 2015**

## OFFICERS

President	Duane Del Duca	303-904-9530
President-Elect	Robin Valore	303-941-6662
VP Activities	Bob Lines	303-973-8838
VP Business	David Boggy	303-470-9313
VP Communication	Bob Snodgress	303-660-8408
VP Membership	Barb Espinoza	303-338-0338
Treasurer	Larry Stearns	303-797-3557
Secretary	Linda Stearns	303-797-3557
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## MARS STAR

Co-Editor	Linda Shupe	303-697-2633 (Unl)
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Volunteers	Judy Nielsen	303-979-6772
<u>Reporting:</u>		
Baltimore	Dottie Ruth	410-665-3207
Cape Canavil	Dick Olson	321-452-4015
Colo Springs	Doug Tomerlin	719-594-6392
ULA	Christa Bell	303-269-5551
Vandenberg	Charlie Radaz	805-733-2051

## CLUB CONTACTS

Bridge	Dave & Kathy Martz	303-683-9524
Dinner	Skip & Pam Hull	303-973-4717
Golf	Frank Garred	720-389-9558
Hiking	Sue Janssen	303-936-8339
Photography	John Chapter (Pres)	303-986-8277
Computer Discovery	John Flater	303-794-6250

## **REMINDER:**

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

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

## DIRECTORS

Director	Larry Major (Chairman)	303-904-0439
Director	Dan Ellerhorst	303-794-0750
Director	Bo Rodriguez	303-798-9157
Director	Dick Sosnay	303-972-9209
Director	Terrie Hamen	303-840-5426
Director	Allen Sanders	303-973-4173

## IMPORTANT PHONE NUMBERS

LM Employee Service Center	1-866-562-2363
CitiStreet 401K Hotline	1-800-444-4015
Aetna Plans	1-888-562-8111
Anthem BlueAdvantage HMO	1-866-863-0484
CIGNA Point of Service (POS) (Hourly Only)	1-800-832-3211/ 1-800-244-6224
CIGNA Healthcare of Colorado for Seniors	303-782-9662
CitiStreet (PSP-SSP-CAP)	1-800-444-4015
Medicare Plus (Aetna)	1-888-562-8111
PacifiCare Secure Horizons	1-800-771-4347
CVS Caremark Prescription Drugs	1-888-562-3784
Vision Service Plan, Rancho Cordova, CA	1-800-877-7195
Kaiser Permanente	303-338-3800
United Dental Health	1-800-545-3260/ 303-425-1537
Delta Dental of Colorado	1-800-610-0201
Kay Girodo	1-800-610-0201, x609 303-889-8609 <a href="mailto:kjirodo@ddpco.com">kjirodo@ddpco.com</a>
Peliton Benefits	(303) 771-1800
LTC/Vision/Dental	<a href="mailto:jbeiler@peliton.net">jbeiler@peliton.net</a>
Joann Beiler	<a href="mailto:jsaxon@peliton.net">jsaxon@peliton.net</a>
Janet Saxon	

**MARS Associates  
P. O. Box 1128  
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**MARS Website:** <http://www.marsretirees.org>

### **Cover:**

**L: Advanced Extremely High Frequency (AEHF)** – Pictured here, the payload module and propulsion core for the fourth AEHF satellite are mated together, bringing the nation's most protected military communications satellite system closer to expanded capabilities nearly five months ahead of schedule. The system provides strategic and tactical protected communications for the US and international partners: Canada, Netherlands, and United Kingdom.

**R: Final Assembly of NASA's OSIRIS-REx Spacecraft** – In a clean room facility near Denver, Lockheed Martin technicians began assembling a NASA spacecraft that will collect samples of an asteroid for scientific study. Working toward a September 2016 launch, the OSIRIS-REx spacecraft will be the first U.S. mission to return samples from an asteroid back to Earth. OSIRIS-REx – stands for Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer – is going to Benu, a carbon-rich asteroid that could hold clues to the origin of the solar system and host organic molecules that may have seeded life on Earth. OSIRIS-REx is the third mission in the NASA's New Frontiers Program. NASA's Marshall Space Flight Center in Huntsville, Alabama, manages New Frontiers for the agency's Science Mission Directorate in Washington.



## President's Corner

By Duane Del Duca  
([ddelduca@comcast.net](mailto:ddelduca@comcast.net))

As we move into spring, I am reminded of how fast another year is going by. Our Annual Meeting is now behind us and we are all looking forward to our MARS day at the Rockies. I know that is not until June, but the way time seems to fly by, June will be here before you know it. The Rockies Flyer is included with this mailing of the STAR.

Looking back for a few moments, I must thank all of you who came to a very well attended and enjoyable Annual Meeting. Thank you all for braving a cold winter day to come to this year's meeting. Bob Lines again picked a great venue, the Pinehurst Country Club. Our guest speaker, Trevor Kilpatrick, from United Launch Alliance did an excellent job of describing the Delta IV booster and how it performed during the Orion mission by carrying the Orion space capsule to its suborbital test flight. Congratulations to both Bob and Trevor.

As our Bylaws state, the terms of office for Officers and Board of Directors is limited. This year we replaced one Officer; Bill Schrott and one member of the Board of Directors; Al Nemes. Bill Schrott's position was taken by David Boggy who will be the new VP of Business and Al Nemes' position on the Board was assumed by Al Sanders. Thanks, to both Bill Schrott and Al Nemes for their service to MARS Associates. Bill Schrott and Al Nemes were presented Service Awards for their contributions to MARS. Thanks to both David Boggy and Al Sanders for their willingness to serve. Also, as is our custom, we passed out Service Awards to those members who have completed their commitments. This year we recognized Lonnie Farmer for his service as President Elect, Dave and Carol Zeller, our past Dinner Club Presidents and Roy and Anita Kannady for their many years of service preparing and validating the Memorial records for deceased retirees.

As you read this article, I would ask that you spend a minute to go back to page two of this issue and review the names of the Officers, STAR contributors, Club Contacts, and Directors who contribute so much to the wellbeing of your MARS Associates. We as members just cannot thank our volunteers enough; they keep it going.

For those of you who were unable to attend the Annual Meeting, this year's winner of the Vernon B. Selby Memorial Volunteer of the Year Award was Joe Marcus. His work at a Monastery located near his home, as a Volunteer Fireman for the Inter Canyon Fire Department for over 40 years, as a volunteer to help his alma mater (Colorado State University) raise needed funds; as a volunteer in his local Parish; as a member of the MARS Board of Directors for two terms; and as a volunteer for many other good causes more than made him worthy to receive this Award; congratulations Joe.

We completed one other item of business at our Annual Meeting by approving a minor change to our Bylaws that made our definition of a retiree more in line with what Lockheed Martin and United Launch Alliance now have. We also noted that our financial reserves fell below the established level that we desire and that we will be seeing a slight decrease in the subsidy the Treasury is able to contribute to the cost of our events.

Remember the Rockies event is coming up and most of all enjoy the coming spring and summer.



## Next Up!!!

By Robin Valore  
([rvalore@gmail.com](mailto:rvalore@gmail.com))

Greetings and happy spring!! Where does the time go? Here we are starting the 30<sup>th</sup> fiscal year since the inception of the organization. The MARS Associates Annual Meeting was held on March 4 and there were more than 185 attendees, despite the questionable weather pattern that morning. The meeting was held at the Pinehurst Country Club and as many of you know, it is a fabulous venue for our events. Not a surprise – the event was a huge success. Lunch was served at noon with a "social gathering" from 11:00 to 12:00. After lunch, Duane provided a "year in review" overview, I provided status on each of the MARS clubs, Duane recognized the newly appointed and departing officers and directors, and then Trevor Kilpatrick from United Launch Alliance (ULA) took the stage to present us with the history of the Delta IV rocket. I don't know about all of you, but when someone can take a technical subject like that and dumb it down enough for me to understand – he was fabulous! Congratulations to Joe Marcus on

his nomination and selection as the 2014 MARS volunteer of the year!!! One hundred copies of the Annual Report were available for distribution at the meeting and I think there were only two copies left when I departed. For those of you who were not able to snag a copy – the report has been posted on the MARS website for your interest and review.

Duane and I were able to meet with Lockheed Martin Human Resources on February 20th. Armando Castorena (HR Vice President) connected us with one of his HR Directors - Avie Verzantvoort. Joining us was Karen Paulson, our MARS liaison with Lockheed Martin. We introduced Avie to the background and history of MARS Associates, talked about how we as an organization can support various Lockheed Martin events, and most importantly, how we can increase the awareness of our organization to those Lockheed Martin employees who are getting ready to retire or are considering retirement. Avie was extremely interested in how best to move our organization forward in terms of getting the word out about who we are and the purpose of our organization. Duane and I were incredibly encouraged by her enthusiasm and energy.

Darryl Boykins, our MARS ULA liaison, is very close to launching a new ULA Employee Resource Group Sharepoint in late March/early April. There is a placeholder on the website that will include introduction materials relative to MARS as well as the MARS website that potential retirees can access for additional information. We believe this is a significant step to increasing additional MARS exposure to ULA retiring employees.

I know this may be a bit of a repeat from the last edition of the MARS STAR – but wanted to officially announce club changes for the new fiscal year. Frank Garred is now the President of the Golf Club, replacing Bob Snodgrass. Pam and Skip Hull will lead future Dinner Club venues, replacing Carol and Dave Zeller. One minor change to the event schedule is the Photography Club – the club is now meeting the second Thursday of every month (except June, July and August) at 1:30 p.m. at the Bemis Public Library in Littleton.

The next MARS event is the Rockies picnic lunch and baseball game. Mark your calendars for June 10 and join us for a fun filled day when the Rockies BEAT the St. Louis Cardinals at Coors Field. The associated flyer is included in this mailing, so get your reservation(s) sent in early.

Lastly, if you have forgotten to mail in your MARS membership renewal for this year, brush the dust off and DO IT! You don't want to miss the fun we are going to have this coming year!

For club meetings and MARS events, the master schedule is at the back of this edition – and as always, the website has the most current information.

See you at the Rockies game!

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## From the Editor's Desk

Tom Pighetti ([tjighetti@g.com](mailto:tjighetti@g.com))

Linda Shupe ([shupel@comcast.net](mailto:shupel@comcast.net))

If you come across an error when studying your STARS, please contact us so corrective action can be taken. Send an e-mail to Tom and Linda or snail mail to MARS Associates, Attn: Editor, P.O. Box 1128, Littleton, CO 80160-1128. Thanks in advance.



## Activities Updates

By Bob Lines

([robtlines@hotmail.com](mailto:robtlines@hotmail.com))

This year's Annual Meeting was a big success. It was held at Pinehurst Country Club and - as is their tradition - it was well done. The food was great, the service was great, we came in under budget, and the guest speaker was truly outstanding. He was Trevor Kilpatrick from ULA. He talked about the Delta IV Heavy (the one that recently launched the Orion spacecraft). It was one of the better presentations we have had. In all, it was a wonderful experience and a good time was had by all. We had 223 reservations and despite the weather forecast that was just awful for the day of the meeting, we still had 185 guests show up, compared to 154 for last year's Annual Meeting. The main roads were in excellent shape and once we got out of the developments, it was smooth sailing.

The next event is the Picnic lunch and Rockies game at Coors Field. The Rockies' opponent will be the St. Louis Cardinals. The flyer for the event is included in this mailing. We hope to see you there.

The other 2015 events are as follows:

Senior Lunch – The Inverness Hotel – July 9<sup>th</sup>

Picnic – Clement Park – September 2<sup>nd</sup>  
Holiday Celebration – Pinehurst Country Club –  
December 2<sup>nd</sup>

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## Senior Fare

By Dave Boggy  
([davidboggy@comcast.net](mailto:davidboggy@comcast.net))

With the beginning of the new MARS business year, Bill Schrott, our long time Business VP, has turned his duties over to myself. Bill has provided me with some guidance and history, handed over his files, and has pointed the way forward. He also left me his phone number for when I need some help, which I very much appreciate. I plan on continuing the dialog with vendors to get discounts for MARS associates and will attempt to fulfill the duties of this position as ably as has Bill over the past two terms.

By way of introduction, I am recently retired from ULA (2014) where I had worked in the Business Operations area of the company. Prior to that, I worked at Lockheed Martin Space Systems on the Atlas Programs. I am a relatively new MARS associate, and while I have met some of the members through the Golf club, I look forward to meeting many more of you as I take over this new position.

The change to the LMCO provided Medicare-eligible retirees' insurance program should not affect any of the insurance plan coverage obtained through our MARS vendors (such as VSP, Delta Dental or Long Term Care Insurance). However, One Exchange does offer dental and vision options which you may also wish to explore. Please refer to the One Exchange website to get information, explore your options, and answer your questions about the new LMCO provided retiree medical benefit programs, [medicare.oneexchange.com/lockheedmartin](http://medicare.oneexchange.com/lockheedmartin).

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## Membership

By Barb Espinoza  
([barb.j.espinoza@comcast.net](mailto:barb.j.espinoza@comcast.net))

### MEMBERSHIP STATISTICS

As of March 31, 2015, MARS Associates' active membership is 1,526, which includes 917 seniors.

Please welcome the following new or reinstated (\*) members:

### Colorado

Aurora	Ronda & Thomas Frickell
Bennett	John Grose
Centennial	Fred & Rose Neumann
Denver	Harold & Elaine Feldman Robert Little & Sheri Mayo
Franktown	Kenneth & Debra Ruiz
Highlands Ranch	Darrell & Sandra Williamson
Littleton	James & Linda Burks Michael & Janet Carroll Robert & Susan Dehn Cynthia & Jack Dekker Dan & Debbie Lynes Michael & Pattie Ochs Robert & Michelle Swank
Lone Tree	Rosemarie Genualdi Glen & Colleen Higashide
Sedalia	John & Crystal Babos

### Other States

Santa Maria, CA	Larry & Marcia Crass
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## **Membership Renewal**

Annual Membership Renewal forms were included in the January STAR mailing. At the current time we have approximately 425 members who have not renewed their 2015 membership. Late Dues Notices were mailed to those members who have not renewed on April 6, 2015. Please mail your check as soon as possible to avoid becoming an "inactive" member.

Inactive members will be dropped from membership in mid-May and will no longer be eligible to participate in any MARS events, clubs, or discounts.

## **MARS Membership Unit**

MARS membership is defined in the policy manual as a family unit consisting of the retiree and spouse (or significant other), although the membership card and mailing data are in the retiree's name. In the event the retiree dies, the spouse becomes the member in his/her own name and may remain a MARS member by continuing to pay the annual dues.

Senior membership status (age 75 and above) is based on the retiree's date of birth, even for the surviving spouse member. It is anticipated that our count of Senior Members will increase to 920 members upon renewal of 2015 membership.

## **Change of Address, email address, or phone number?**

Please remember to include the MARS membership team in your list of people to notify when you move. We are still experiencing a number of STAR packages being returned for incorrect addresses. The United States Post Office does not forward bulk mail and MARS is charged for all returned mail.

"Snow Bunnies" remember to let us know when you return home! Thanks.

## **In Memoriam Data**

Please contact me or Bev Baugher ([bevbaugher@earthlink.net](mailto:bevbaugher@earthlink.net)) with any information regarding the passing of a member or their spouse. We want to make sure their passing is acknowledged in the ***In Memoriam*** section of the STAR.

Barb Espinoza,  
VP, Membership, at:  
MARS Associates,  
P.O. Box 1128, Littleton, CO, 80160-1128;  
Phone 303-338-0338; or email  
[barb.j.espinoza@comcast.net](mailto:barb.j.espinoza@comcast.net).

## **MARS Associates In Memoriam**

By Bev Baugher  
([bevbaugher@earthlink.net](mailto:bevbaugher@earthlink.net))

### ***Members***

Anderies, Jack (D: December 2014)  
(Survived by Joan Anderies)  
Denver, CO  
<http://tinyurl.com/qf6m65m>

Carney, Carmen (D: February 2015)  
(Survived by Ray Carney)  
Littleton, CO  
<http://tinyurl.com/qddnm2j>

Cooper, Wayne (D: January 2015)  
Denver, CO  
Obituary not published.

Forrester, Marie (D: December 2014)  
(Survived by Elwin (Al) Forrester)  
Mesa, AZ  
Obituary not published.

Fria, Anthony (D: March 2015)  
Littleton, CO  
<http://tinyurl.com/k8ujcwt>

Frohardt, Melvin (D: November 2014)  
(Survived by Ester Frohardt)  
Centennial, CO  
Obituary not published.

Fullerton, Donald (D: February 2015)  
(Survived by Mary Alice Fullerton)  
Centennial, CO  
<http://tinyurl.com/n63j23u>

Hensley, Eleanor (D: October 2014)  
(Survived by Otis Hensley)  
Escondido, CA  
<http://tinyurl.com/qznpvj8>

Ilgen, Shirley (D: October 2014)  
(Survived by Paul Ilgen)  
Castle Rock, CO  
<http://tinyurl.com/n9xdwds>

Kardaseski, George (D: May 2014)  
(Survived by Wilma Kardaseski)  
Littleton, CO  
<http://tinyurl.com/lmkafp5>

Kiley, Richard (D: November 2014)  
(Survived by Nancy Kiley)  
Littleton, CO  
<http://tinyurl.com/q2om345>

Knox, Marilyn (D: August 2013)  
(Survived by Robin Knox)  
Littleton, CO  
<http://tinyurl.com/l7jgnlh>

Krueger, Linda (D: January 2015)  
(Survived by Gene Krueger)  
Mesa, AZ  
[SonoranSkiesmortality.com](http://SonoranSkiesmortality.com)

LaGrange, Lloyd (D: February 2015)  
Aurora, CO  
<http://tinyurl.com/mc8uobb>

Loggins, Tommy (D: March 2015)  
Littleton, CO  
<http://tinyurl.com/q9hb3kw>

Stofer, William (D: January 2015)  
(Survived by Donna Stofer)  
Littleton, CO  
<http://tinyurl.com/kp2mzd2>

Turner, David (D: January 2015)  
(Survived by Marion Turner)  
Golden, CO  
<http://tinyurl.com/q3hyc74>

Unnerstall, Donald (D: December 2014)  
(Survived by Janet Unnerstall)  
Douglas, WY  
<http://tinyurl.com/o2pzd4x>

Wells, Gerald (D: December 2014)  
(Survived by Emilie Wells)  
Denver, CO  
Obituary not published.

## **Non-Members**

Blackwell, Elmo (D: December 2014)  
Dimmit, TX  
<http://tinyurl.com/kack5zh>

Brooks, Garold (D: January 2015)  
(Survived by Donna Brooks)  
Littleton, CO  
<http://tinyurl.com/nr8f8v6>

Feldman, Arthur (D: January 2015)  
(Survived by Lee Feldman)  
Denver, CO  
<http://tinyurl.com/m6mb55v>

Garcia, Andrew "Andy" (D: January 2015)  
(Survived by Elizabeth Garcia)  
Denver, CO  
<http://tinyurl.com/pphgqho>

Goble, Richard (D: November 2014)  
Casa Grande, AZ  
<http://tinyurl.com/namyo5y>

Paynter, Howard (D: January 2015)  
(Survived by Janet Paynter)  
Littleton, CO  
<http://tinyurl.com/pyw5ngq>

Sherlock, Robert (D: February 2015)  
Denver, CO  
<http://tinyurl.com/plds2tx>

Williams, Curtis (D: February 2015)  
Centennial, CO  
<http://tinyurl.com/mudt6lt>

Moses, Rufus O. (Moe) (D: March 2015)  
Littleton, CO

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## **Historian's Corner**

Ray Ziehm (POC)  
([rzandmm@comcast.net](mailto:rzandmm@comcast.net))

### **Interesting Events and Lessons Learned in Early Aerospace Activities**

By Ray Ziehm

Aerospace technology has presented American Industry with many new challenges and opportunities that most engineers, designers, and programmers had never

experienced in other fields of science, engineering, and manufacturing. This is most evident in the levels of environmental issues, mechanical loads, dynamics, and of course, orbital mechanics. Temperatures, pressures, vibration, shock, radiation, and timing requirements far exceeded levels encountered by most organizations. Essentially no advanced education in the realm of aerospace was available and Aeronautical Engineering was the closest to what would be required, even though it was still a long way from adequate for aerospace. As has always been done, engineers and managers relied upon the basic laws of physics to adapt to the almost unbelievable numbers to be dealt with.

In October 1957, the Soviet Union launched the Sputnik I satellite and Americans were taken by surprise. The military immediately recognized the potential of the event and it was a wake-up call for the country in general. Sputnik I was a crude, simple vehicle that achieved only a three month orbital life and carried no scientific instrumentation, but it did beep. I got up at four in the morning on the first two days and actually saw the blinking reflection of the sun on the tumbling vehicle. Americans were stunned and felt we had already lost an unannounced, unrecognized space race. Actually, it only took a few weeks until January 31, 1958, when an American satellite with more capability was launched into orbit. This launch was the Explorer I, placed into orbit by a modified Jupiter I launch vehicle carrying an instrument complement that made an astounding scientific discovery, the presence of the Van Allen Radiation belt. The size of the belt was confirmed by Explorer III in March 1958. This discovery would place restrictions on the space industry for all subsequent manned and unmanned space launches and operations. Both Sputnik and Explorer launch vehicles were derivatives of the German V-2 rockets used in World War II. Explorer I ceased communications May 23, 1958, and re-entered the atmosphere in March 1970.

In no way did the Sputnik launch show that America was behind in space exploration, although the media and many others felt that it did. The U.S. Navy Vanguard satellite was well along in development and was much more sophisticated, both in the launch vehicle and in its instrumentation, far ahead of the Soviets. The instrument complement included cosmic ray detection, temperature sensors, thermal control surfaces, and micrometeoroid detectors. The U.S. Navy three-stage Vanguard I satellite was launched March 17, 1958, and placed into a stable orbit that was estimated to last two hundred and forty years, surpassing Sputnik a bit. Today the Vanguard I spacecraft is the longest man-made article orbiting the Earth. Indeed, the Soviets were there first, but their scientific accomplishments were almost insignificant.

As the American industry came up to speed in sufficient numbers and investigated some of the issues to be satisfied, many new discoveries were made and sometimes surprising results were found. One of the early discoveries to be made was not really new or surprising, but no-one had thought of it. Isaac Newton taught us in his first law that static or moving bodies will remain in their current state until acted upon by an outside force. This was applied to orbiting satellites and often implemented to control satellite attitude through spinning them to establish a momentum vector that would never change. Explorer I was a long vehicle relative to its diameter, spun up around its long axis in a desired attitude, and was expected to remain so. Somewhat later, the vehicle was found to be spinning with a coning movement, which surprised everyone.

At that time I was spacecraft lead design engineer of possibly the first funded Martin Denver study of a mission dedicated Earth orbiting satellite. We were investigating whether the vehicle should be spin stabilized or three axis stabilized by active thrusters to best satisfy mission objectives. Our Attitude Control Engineer was in contact with government engineers in the Aerospace Corporation, who were investigating the issue. They knew that the vehicle was initially spun about a non-principle axis and soon realized that if any energy was lost from the system, conservation of momentum would cause the vehicle to nutate such that it would eventually spin about another lower energy, but momentum conserved axis, namely tumbling end-over-end. They also concluded that any energy lost, such as a wire bundle or structural flexing or moving within the vehicle, could be the cause. The physicists understood the issue and it soon became known that moment of inertia ratios of spin stabilized space vehicles had to be carefully controlled and that they could be used to stabilize the vehicle attitude or to cause a spinning vehicle to precess to a new spin axis as the mission required, but no-one had really thought about it till it occurred. The laws of physics prevail.

Another, almost comical, experience was solving the helium line contamination problem on the Denver Static Firing Test Stands. When Stand D-2 was first activated, we were not able to pass the particulate contamination requirements of the Mil Spec. The entire high pressure line from Cold Flow to the stand was torn out, taken to the factory, and re-cleaned with an acid bath, and whatever, and reinstalled, it still did not pass. One of our test engineers, Bob Munden, who had missile firing experience at Edwards AFB and Muroc, said he knew how to fix it. He had the factory build a hollow cylinder about three feet long, and about ten inches in diameter with a two inch wall thickness with fittings on each end to fit the supply pipes. He then bought several boxes of Kotex and carefully packed them into the hollow center



of the tube. The system then passed with flying colors, and similar filters were installed on all stands.

Amazing things were also happening in the factory. I-beam shaped ring frames were being bent to fit into a ten foot diameter to stabilize the Titan propellant tanks. Straight I-beam sections were fed into a stretch forming machine and pulled through a set of dies and came out with a perfect five foot radius. It was a pleasure to watch this machine in action and I cannot imagine the cost and difficulty in forming these parts in any other way. The tank welding fixture was another really super concept. It held pre-welded barrel sections in alignment and automatically welded them with a beautiful pattern as it rotated. The industry had said that ASM 2014, a very strong aluminum alloy, was not weldable, but the designers needed its high strength, and the welding engineers derived a way to successfully do it that survives today.

Some advantageous happenings have been learned in the area of orbital mechanics. One is related to affecting a circular orbit maneuver to bring a satellite on orbit into a position that will allow a rendezvous with another in the same orbit, but ahead in position. At first one might think that if you are trying to catch up with something ahead of you, the thing to do is to speed up by a thruster burn. Actually that will place you in an elliptical orbit with a higher apoapsis that will have a longer period and place you further behind. The proper thing to do is to thrust against the orbital velocity path which will change your orbit to elliptical with a lower periapsis that will have a shorter period of revolution and bring you closer to the orbiting target. When you have caught up with the target, a second thrusting burn is required to recircularize your orbit and you will have achieved a near rendezvous with the target vehicle. Of course the mission analysis folks have always been aware of this, but at first glance to the neophyte, it just seems wrong to go backwards to get ahead.

Another interesting phenomenon is the orbital swing-by maneuver used to support interplanetary missions by adding velocity to a space vehicle as it flies by a major orbiting body, normally another planet. The passing spacecraft is guided to closely fly by the larger body in a carefully designed path that exposes it to the larger body's gravitational field. The spacecraft is pulled toward the planet by the planet's gravity, but also is affected by the fact that the flyby mechanics are such that the desired spacecraft flight path is aligned with the planets velocity vector which is added to the spacecraft. As the spacecraft passes the planet and begins to move away, it now must sacrifice only the velocity gained from the gravitational pull when approaching the planet. This maneuver can add thousands of miles per hour velocity

in what seems to be a free gift, but there is no free lunch in physics. The energy gained by the spacecraft is subtracted from the energy of the planet, but due to the huge difference in the mass of the two bodies, the change to the planets orbit is so small it cannot even be measured. This maneuver requires the entire mission to be programmed around this opportunity which places serious launch window constraints upon the mission. One of our mission analysis engineers, Gerald Hollenbeck, delivered some AIAA and AAS technical Papers in 1975 describing this maneuver, and his mission plan for outer planet missions was implemented on the Cassini Spacecraft mission. He was awarded the Dirk Brower Award by JPL for his effort.

Many other simple things that have sufficed for years have proven to be inadequate in space. One excellent example is the use of relays in electrical circuits. Relays often have multiple sets of switch contacts, all assumed to operate at the same time. In reality, many events need to be controlled to the milli-second in many space systems and sometimes the contacts within a relay have been found to open or close at varied times. This problem has been called a relay race.

Another issue with the use of relays in space is that the contact points in a relay are mechanical devices that can react to environmental shock and vibration by opening or closing a circuit at an inopportune time. One Titan ICBM was destroyed immediately following launch due to the orientation of the destruct system relays being such that the mechanical switch parts reacted to a shock wave from the firing of the launch bolt ordnance traveling up the structure, jolting the relay which closed the contacts, and firing the destruct system ordnance that destroyed the vehicle. Previously the relays were oriented in a different attitude; however the decision was made generally to replace relays with motor driven switches.

It's recently been said that the last fifty years have produced more technological advances than that of all previous history. Just think, we have seen it happen and even been a part of it.



## Bridge Club

By Dave & Kathy Martz  
([martz20@comcast.net](mailto:martz20@comcast.net))

"If serenity is one's major ambition, perhaps bridge should be avoided", stated Charles Goren, probably the most well-known of all bridge players.

Come join us at our monthly get together! All MARS members and their guests are welcome. We play on the **3rd Friday of each month at the Buck Community Recreation Center (Littleton) from 10 a.m. to 2 p.m.** (pack your lunch). The club provides the cards and all requirements for the games as well as coffee, tea, and hot water, for your enjoyment. There is a small fee to the Buck Center as well as a small fee to the club, which helps with supplies and the year-end party in December.

We have couples, as well as singles, playing. If you don't have a bridge partner, the club can assist in finding one for you, but you need to let us know in advance.

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

Presidents:

Dave & Kathy Martz, 303-683-9524

Vice-President:

Bill Kacena, 303-973-2685

Secretary:

Theodore Bornhoeft, 303-933-9730

The 1<sup>st</sup> Quarter 2015 winners are as follows:

### January 16 (4 tables)

1<sup>st</sup> – Paul & Marie Stanton

2<sup>nd</sup> – Glenn Gerlach & Mary Stirling

3<sup>rd</sup> – Bill & Mavis Kacena

4<sup>th</sup> – Ed & Laurie Bock

### February 20 (4 ½ tables)

N/S 1<sup>st</sup> – Dave & Kathy Martz

2<sup>nd</sup> – Joe Pohlen & Fred Ems

E/W 1<sup>st</sup> – Leo Johnson & Joni Rosenberger

2<sup>nd</sup> – Ed & Laurie Bock

### March 20 (3 ½ tables)

1<sup>st</sup> – Dave & Kathy Martz

2<sup>nd</sup> – Ed & Laurie Bock

3<sup>rd</sup> – Theodore Bornhoeft & Trudy White

4<sup>th</sup> – Curt & Phyllis Brudos

## Dinner Club

By Skip and Pam Hull  
([pamhull.7@msn.com](mailto:pamhull.7@msn.com))  
303-973-4717

We are excited to be organizing the monthly outing for MARS members.

Attendance has been steady so far this year; but, we still have room for additional reservations for most venues. That said, please remember, venues that have attendance limits need your reservation sooner than later if you wish to attend.

The restaurants scheduled for the rest of the year are as follows:

- April 15 – **Arrowhead Golf Club** – lunch
- May 19 – **Garden Terrace at Inverness** – lunch
- June 15 – **No No's Café** – dinner
- July 15 – **Mt Vernon Country Club** – lunch
- Aug 11 – **White Fence Farm** – dinner
- Sep 15 – **Red Lobster** – lunch
- Oct 13 – **Luigi's Italian Restaurant** – lunch
- November \* **TBD**
- December – **MARS Holiday Celebration** – No Program

\*Specific dates will be on fliers.

If you have a suggestion, please let us know, by email or by phone (**please leave a message** if we are not home).

**Please remember that it is helpful if you send a single check to simultaneously reserve spaces for multiple Dinner Club events.** Please do not combine Dinner Club events with other MARS events since those go to a different address. Also, **please remember to include the name(s) of guest(s) and a good phone number where you can be reached on the reservation slips in case of last minutes changes.** This will greatly simplify preparation for these wonderful events.

We hope to see more of you joining us for dinner or lunch this year. It is a great chance to rekindle friendships or make new friends that you already have something in common with.

Finally, to quote a cooking channel chef, Alton Brown, we wish you "Good Eats".

## Golf League

By Frank Garred

([frankgarred@comcast.net](mailto:frankgarred@comcast.net))

The 2015 season kicked off at Broken Tee Golf course on April 2<sup>nd</sup> and runs through October 29<sup>th</sup>. We will again alternate between Broken Tee and Common Ground Golf Course.

We welcomed several new members at our kickoff meeting March 2<sup>nd</sup> - Robin Valore, Glenn Boldman, Stephen Martin, and Don Purkey. There is still time. If you are interested in joining us, please call one of the League officers shown on the Golf tab on the MARS Website.

Congratulations to Bob Bowe on his hole-in-one on the second hole at Common Ground last October!

GOOD GOLFING TO YOU!!

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## Photography Club

By John Flater

([jfflater@msn.com](mailto:jfflater@msn.com))

Please go to the MARS RETIREES-Internet Explorer website at: <http://marsretirees.org/>. On the first page go to the box titled "What's New on the MARS Website" and click on the highlighted words "Photo Club".

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## Computer Discovery (EzyBytes)

By John Flater

([jfflater@msn.com](mailto:jfflater@msn.com))

No article submitted this quarter.

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## Hiking Club

By Sue Janssen

([susan.g.janssen@gmail.com](mailto:susan.g.janssen@gmail.com))

Today I am enjoying the daffodils and hyacinth flowers in my garden. The flowers and trees think it is spring – but they will be treated to more snowfall soon. I hope we also get more snow in Summit County because the club plans to snowshoe near the town of Montezuma on April 15<sup>th</sup>.

The hiking club enjoyed two outings since the first of the year. In February seven members went snowshoeing along the Jones Pass trail near Empire. The trail gently

climbs through the trees along a 4WD road to an open valley with panoramic views of the surrounding peaks – many over 12,000 feet. The weather was lovely and the light snow gave the forest a quiet softness. Sue and Lee practiced searching for avalanche beacons while the others enjoyed a quick snack. After the hike, we regrouped at Tommy Knockers in Idaho Springs to enjoy lunch and the adult beverage of our choice. Thanks Lenny, for organizing a fun day!



] Sue Janssen, Jill & Lenny "Poles Up" Demchak, Hal Feldman, Tom Pawlowski, Lee Janssen, and Sue Pawlowski are happily returning to the Jones Pass trailhead – it is all downhill from here.

Our March hike was in Rocky Mountain National Park and led by Glenn Gibson. The group met at the visitor center to consult a ranger for recommended trails. We chose to start at the Bear Lake trailhead and follow the trail to Nymph Lake and decide if we would proceed to Dream Lake and Emerald Lake. The trail was well-packed for the half-mile to Nymph Lake and the group was enjoying the scenery. As we continued to Dream Lake, the trail became more challenging with steep portions and some route finding. We proceeded along the shoreline and walked through trees and boulders through rolling terrain. A short descent brought us to Emerald Lake and a beautiful view of the cliffs of Flattop Mountain, Hallett Peak, and Tyndall Glacier. The return offered open views down the valley and some "exciting" downhill slides. We worked up an appetite over the seven mile trek, so the group enjoyed lunch at the Estes Park Brewery.



Dick Sosnay, Sue Janssen, Sally Sanders, Lee Janssen, Al McKinney, Al Sanders and Glenn Gibson tromped 3.6 miles to Emerald Lake.

Our April hike will be a snowshoe near Montezuma. The May outing is to Brainard Lake Recreational Area and June is to Willow Springs, near Ken Caryl Ranch. A meeting will be held late May to plan the summer and fall events. The schedule of hikes is posted on the MARS website (<http://www.marsretirees.org/>). Even if you have never gone snowshoeing or hiking, you are welcome to join in the fun.

If you wish to join the MARS Hiking Club, contact Sue Janssen at [susan.g.janssen@gmail.com](mailto:susan.g.janssen@gmail.com), who will add you to the club distribution list. Happy trails!

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## The MARS Associates Website

By Jim Kummer  
([jkummer@comcast.net](mailto:jkummer@comcast.net))

Recently a new 'feature' appeared on my web browser. When viewing product sources, a small window would appear. When I would move my mouse cursor over an item, this small window would offer a few products it thought were similar to the one under my cursor. If I would move my cursor into this small window, then those products offered, would pop up in slightly larger windows. Should I click on one of those new windows, I would get a whole new window detailing this new product. This 'feature' listed its name as "visual shopper", seemingly offering a simple way to do comparison shopping.

I absolutely did not want this 'feature'. This little window was bothersome and actually covered some of the larger window's content. So I GOOGLE'd "visual shopper", and learned that it was planted in my browser by my internet service provider, COMCAST. Apparently this 'feature' was deemed as something positive and

helpful to the user. I didn't think so, and others felt the same, as indicated by the links GOOGLE found. Some of the links offered by GOOGLE provided the means to eliminate the 'feature'. The not-at-all obvious procedure was to click on a small window and then find the little teeny "i" in a circle. Clicking on that, popped up a window, in which was an offer to remove the "visual shopper".

Whenever something in your web experience annoys you, the first action should be to use a search engine (GOOGLE, BING) to get information and remedies. Your computer or browser might be infected with "malware" and the search might give you the fix. Lacking this, you can try running any one of a number of SPYWARE/MALWARE repair tools that are available. These can be found by searching on the term "malware".

The MARS website is free of viruses and malware. There you'll see topical and timely information valuable to members. Here are the monthly websites of the month from the last quarter.

- January - [Smithsonian National Museum of Natural History Virtual Tour](#)
- February – For information regarding the revised corporate health coverage, go to [medicare.oneexchange.com/lockheedmartin](#), for details and a half-hour video; or phone 1-844-596-0460 to speak to an advisor
- March – [Tax Help and Forms](#) , [Tax Changes for 2014](#), [Colorado Revenue Online](#)

Your website committee members are: Duane "Smitty" Smetana, Linda Stearns, Paul Bingham, Bob Knickerbocker, and Jim Kummer (Webmaster).

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## Lockheed Martin IS&GS and Heritage Companies Retiree Group (Colorado Springs) News

By Doug Tomerlin  
([dougincs@aol.com](mailto:dougincs@aol.com))

Our spring luncheon is tentatively planned for May of 2015 with location to be determined. If you would like more information about the group or the luncheon, please contact Doug Tomerlin at [dougincs@aol.com](mailto:dougincs@aol.com).

We had a larger than normal number of retirees who joined the group since the last newsletter. We welcome

the following retirees to the Colorado Springs Lockheed Martin IS&GS and Heritage Companies Retiree Group and hope to see all of you at our spring luncheon:

- Bonnie Nickens
- Steve Barrette
- Margaret Guidry
- Pat Browne
- Craig Johnson
- Renzo Bianchi
- Debbie Jarrel
- Bill Bane
- Rick Branham
- Al Yeager
- Dennis Green
- Jim Cole

We were all saddened by the death of retirees Dick Merkle and Billy Allison.

- Richard (Dick) Lee Merkle left this earthly world to be with his Master on January 5, 2015. After college, he received his first job working for Lockheed Martin IS&GS Heritage Company Philco Ford, which would move him and his family to Philadelphia, PA and later to Colorado Springs, CO where he spent the remainder of his life.
- MAJOR (Ret.) Billy G. Allison, USAF, 78 of Colorado Springs, CO, passed away January 26, 2015 at his home. He was a loving husband, father, and grandfather, as well as a Procurement and Purchasing Manager for Lockheed Martin Heritage Company Ford Aerospace Corporation before retiring in 1987. Billy also retired from the United States Air Force.

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## **RAMM – Baltimore News**

By Dottie Ruth  
([dotruth725@comcast.net](mailto:dotruth725@comcast.net))

Our Maryland winter, this year, was not as generous as in the past couple of years. We had no large amount of snow as the poor people in Boston, but we had it frequently accompanied by a lot of icy conditions. Thankfully, we decided a couple of years ago, to not have any meetings in January or February, thus eliminating any stress of cancelations. Our biggest problem was "Cabin Fever." No way were our elderly legs allowing us to ski on any ice, so indoors we stayed – and stayed – and stayed. We looked forward to March

20 when we would welcome the first day of spring, but snow arrived to greet us also.

We are sad to report that Mel Ruth, RAMM's Vice President and co-founder of the RAMMs died of a stroke on January 2. He was continuously active in the Retiree Association since it was formed in 1985. Andy Bauer, another co-founder, will replace Mel as vice president. Mel was also my loving husband of 72 years. We will all miss him.

Our first meeting of 2015 was held on March 25, where about fifty members enthusiastically greeted one another at the Chug A Mug. The membership chairperson, Olga Sparkman, had just completed this year's renewal and announced we now have 195 RAMM members. This is 33 less than last year, due to death and health problems. We miss them, but dwell mainly on the wonderful memories they left behind.

In May we will be having our Spring Fling Dance followed by the picnic in June, two events that many attend. Our picnic was always held at Rocky Point Park until a few years ago when we had to be indoors due to our low tolerance for Baltimore's hot summers and the need for air conditioning. It worked out great. No need to fan ourselves, swat flies, or worry about the sting of a bee as we sip our beverages. We just munch on our hot dogs and exchange stories of our old Glenn L. Martin days.

Until next time, stay healthy, and enjoy the warm weather.

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## **Cape Canaveral News**

By Dick Olson  
([Olsons5145@aol.com](mailto:Olsons5145@aol.com))

### **TITAN PROGRAM CELEBRATION**

2015 marks the ten year anniversary of the last Titan launch, a Titan IVB. The Titan has established a legacy from the first Titan which was developed as an ICBM, the Titan II, Titan III, Titan 34D, commercial Titan, and the Titan IV. Through the years Titan has supported Air Force, NASA, DoD, NRO, Gemini, etc. programs in defense of our country, scientific missions (Viking Mars, Voyager, Cassini, etc.), and support of America's Warfighters. It has a proud history, being America's Workhorse.

The celebration of the last Titan IV launch and the Titan Program is planned for May 1-2, 2015, in Florida. We

invite **ALL** former employees, **ALL** contractors, who have in anyway been a part of **ANY** Titan Program from the first vehicle to the last, to participate. So far we are somewhere around 200 people and know of more yet to come in.

Hope to see you at the reunion on May 2<sup>nd</sup>.

## **GO TITAN!!!**

### **Trying to find...**

I have a good friend who finished high school in New Jersey with Warren Welch and she asked me if I knew where he was now. Her name is Christine Shaw and she lives in Carson City where Mike and I are retired. If anyone knows, please let me know so I can tell Chris. Warren attended one of their high school reunions in the 1990's. Warren worked on the Pershing program for Martin and I was his Secretary in the Contracts Dept. at Martin in 1962 and 63. Thanks, Bobbie Mikesell

### **Cancer Status**

Phil Pendleton - Last CAT scan was not so good. Three nodes increased its size and three new ones. My Sutent has run its course. So we'll be changing to a new drug. Doc says that he has a shelf of drugs, and as one quits working, he'll switch to a new one. I feel fine, but have to keep a positive outlook. Next scan will be in April.

### **Luncheons**

**February** - Had a pretty good turnout this month. Regulars Walt Starkey, Bill Rhode, Dick Hinshaw, Ken Hawes, Bill Masterson, Don Anderson, Frank Indahir, Hank Ambrosh, Herb Pugh, Roger Wright, Abe Smith, Nick Geso, Hal Castleton, Cal Moser, Judy Kline. Jerry Teague, Chris Hutchmacher, Jimmie Weddle, Lynn Johnson, Larry Gleason Jerry Moskovitz, and some we haven't seen for a while, Lynn Lohne, Ralph Graves, and Bob Matschner.

Lynn Johnson tried to shed some light on the new health insurance requirements. Bottom line, you have until the end of May to pick a plan or you won't have insurance come June 1st. You also need to schedule your appointment as they are already full through late March.

Encourage everybody to send in their Titan reunion forms. Early entries help with ordering shirts and figuring out catering requirements.

Everybody have a nice Valentine's Day.

**March** - Pretty good turnout on a beautiful Florida day. Regulars Wendell McDaniels, Don Anderson, Walt Starkey, Hal Castleton, Nick Geso, Jimmie Weddle, Herb

Matthias, Cal Moser, Ken Hawes, Roger Wright, Frank Indahir, Dick Hinshaw, Bill Masterson, Dave Kintigh, Bob Matschner, Abe Smith, Judy Kline, Larry Gleason, Ralph Graves, and Hal Penley. A couple we haven't seen for a while, Ed McMechen flew down from Ocala and his brother Guy joined us.

**April** - Had a nice turnout for lunch. Regulars Wendell McDaniels, Jerry Teague, Don Anderson, Abe Smith, Frank Indahir, Cal Moser, Walt Starkey. Ed McMechen, Roger Wright, Nick Gesso, Ken Hawes, Hal Castleton, Larry Gleason, Dick Hinshaw, Bill Rhode and Ralph Graves. Some that we haven't seen for a while are Bob Anderson, Sid Warren, Barry House and Don Bollinger made his first appearance.

Several people have asked about tickets for the reunion. There will be a table set up at the BBQ at KARS park where you will receive a "goodie bag" with meal tickets, name tags, shirts (if you ordered them), and handouts. Please try to have your paperwork in by the April 10th, especially if you are ordering shirts.

### **Obituaries**

Vern Hawkin's obituary was in the 1/25/15 paper. Vern was an engineer with Aerojet at the Cape for many years on the Titan program.

Roy Elwood Squires - 2/13/1936-3/26/2015 - Roy went to UC Berkeley and UC Davis graduating with honors with a degree in Physics from UC Davis. He was one of two in the first graduating class at UC Davis ever to receive a Master's degree in Physics. In 1959 he went to work at Aerojet obtaining his dream career of being a Rocket Scientist. While at Aerojet Roy wrote "The Titan Propulsion Handbook" that has been distributed throughout the United States and world aerospace communities. In 1998 he retired from his 39 year career that he loved at Aerojet. Roy taught Calculus and Physics at both American River College and UC Davis.

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## **Martin Marietta Retiree's Club (Vandenberg News)**

By Charlie Radaz  
([fcmjradaz@aol.com](mailto:fcmjradaz@aol.com))

Our January meeting was held on the 29th at historic Pea Soup Andersen's in Buellton with 35 attendees. In what has become an annual program for January, we had Beverly Wilson, CPA from Walker, Wilson and Huguen, review the latest income tax laws. She, again provided everyone with a handout summarizing the highlights for this tax year.

We met on the 26<sup>th</sup> of February in the Historic Santa Maria Inn. We were happy to welcome 65 members and guests for lunch. The 50-50 winners were: \$30 won by Heather Quinn and \$35 won by Rod McCarthy. After lunch we adjourned to the Ranchero Room where Jennifer Dinter from One Exchange Health Care Benefits presented a summary of the process for Retirees to follow in transitioning their insurance coverage. We were pleasantly surprised to have over 200 local area retirees attending her presentation and Q & A session. Several retirees have joined our club since this meeting.

We were pleased to have Bob and Vel Weston (Denver LMA Retirees) visiting in the area, the last week in March, enabling our reminiscing about previous times!!!

We met on March 26<sup>th</sup> at Pea Soup Andersen's in Buellton with 34 attendees. Our speaker was 93 year old Marie Schlueter of Vandenberg Village telling about her life. She was one of the first five women to work in the factory at Douglas Aircraft in Long Beach, CA. She went from sorting bolts to Aircraft Quality Inspector! She was a pilot that became a homemaker as well as working at Douglas while her husband was a pilot flying the hump in Asia during WWII.

She is very active in our local community, with 12,000 volunteer hours at the La Purisima Mission, 6,000 hours at the Lompoc Museum, and works every Friday volunteering at the Lompoc Valley Hospital. She is Woman of the Year 2015 for Lompoc!

Stewart Mee won the drawing for \$32.00.

Sadly, we have lost two more friends and associates: Walt Lewis and Ken Darby. Walt, Engineering Dept., Titan Programs, passed away on February 17<sup>th</sup>. Ken Darby, who died Feb 27<sup>th</sup> at age 85, worked on Vandenberg Launch Operations Titan Programs.

Our next meeting will be at the Village Country Club in Vandenberg Village. The program will be presented by employees from Denver researching the historical use of processing and launch facilities. This meeting will be on April 30<sup>th</sup> at Noon.

Our club normally meets the last Thursday of each month at Noon. We rotate between Santa Maria, Lompoc, and Buellton. All former employees, their spouses, and associate contractors are welcome to attend, visit, and share informal stories.

Call Aubrey Collins (805) 937-8299 for location and reservations.

## United Launch Alliance News

By Christa Bell  
([christa.m.bell@ulalaunch.com](mailto:christa.m.bell@ulalaunch.com))

### United Launch Alliance Names Robbie Sabathier as Vice President Washington Operations

**Centennial, CO, (March 31, 2015)** – United Launch Alliance (ULA) announced today that Robbie Sabathier was named the company's vice president of Washington Operations.

"Robbie brings with her extensive government relations experience specializing in international business, as well as aerospace and defense," said Tory Bruno, ULA's president and CEO. "Her strong background interacting with key Washington, D.C., customer communities, including Congress and White House staff will be instrumental in shaping critical policies and decisions related to ULA business. We could not be more pleased to welcome her to our team."

Prior to ULA, Sabathier was president of a law office she founded in Washington, where she represented the European launch company Arianespace. In addition, she co-founded a startup telecommunication company specializing in designing, deploying and operating low-cost, high-speed internet networks to serve rural communities.

"It is a tremendously exciting time in the aerospace industry and I am pleased to be joining the nation's premier launch service company to lead the D.C. operations," said Sabathier. "ULA's current path will transform the launch services market by offering innovative, affordable and reliable access to space."

Sabathier holds a bachelor's degree in international business from San Diego State University and a Juris Doctorate from American University Washington College of Law.

With more than a century of combined heritage, United Launch Alliance is the nation's most experienced and reliable launch service provider. ULA has successfully delivered more than 90 satellites to orbit that provide critical capabilities for troops in the field, aid meteorologists in tracking severe weather, enable personal device-based GPS navigation, and unlock the mysteries of our solar system.

## United Launch Alliance Successfully Launches Second Mission in Less than Two Weeks

**Cape Canaveral Air Force Station, FL, (March 25, 2015)** – A United Launch Alliance (ULA) Delta IV rocket successfully launched the ninth Global Positioning System (GPS) IIF satellite for the U.S. Air Force at 2:36 p.m. EDT today from Space Launch Complex-37. This is ULA's fourth launch in 2015 and the 95th successful launch since the company was formed in December 2006.

"Congratulations to the Air Force and all of our mission partners on today's successful launch of GPS IIF-9! The ULA team is privileged to work with this world-class U.S. government and contractor mission team and we are proud to contribute to the GPS capabilities that were delivered to orbit today," said Jim Spornick, ULA vice president, Atlas and Delta Programs. "This entire team is focused on 100 percent mission success, one launch at a time, and also providing on-time launches to meet our customer's mission needs."

This mission was launched aboard a Delta IV Medium-plus (4,2) configuration Evolved Expendable Launch Vehicle (EELV) using a single ULA common booster core powered by an Aerojet Rocketdyne RS-68 main engine, along with two Orbital ATK GEM-60 solid rocket motors. The upper stage was powered by an Aerojet Rocketdyne RL10B-2 engine with the satellite encapsulated in a four-meter-diameter composite payload fairing.

GPS IIF-9 is the ninth in a series of next generation GPS satellites and will join the GPS worldwide timing and navigation system utilizing 24 satellites in six different planes, with a minimum of four satellites per plane positioned in orbit approximately 11,000 miles above the Earth's surface. The GPS IIF series provides improved accuracy and enhanced performance for GPS users.

ULA's next launch is the Atlas V AFSPC-5 mission for the United States Air Force, scheduled for May 6 from Space Launch Complex-41 from Cape Canaveral Air Force Station, Florida.

The EELV program was established by the United States Air Force to provide assured access to space for Department of Defense and other government payloads. The commercially developed EELV program supports the full range of government mission requirements, while delivering on schedule and providing significant cost savings over the heritage launch systems.

## NASA Selects United Launch Alliance Delta IV Heavy Rocket to Launch Solar Probe Plus Mission

### ULA Wins Competitive Contract for 2018 Launch

**Centennial, CO, (March 18, 2015)** – NASA's Launch Services Program announced today that it selected United Launch Alliance's (ULA's) proven Delta IV Heavy vehicle to launch the Solar Probe Plus mission to study the sun's outer atmosphere. This award resulted from a competitive procurement that considered multiple launch providers.

"The ULA team is very proud that NASA has selected the Delta IV Heavy launch vehicle for this extraordinary science mission," said Jim Spornick, ULA vice president, Atlas and Delta Programs. "The Delta IV Heavy rocket is uniquely qualified to provide the launch service for this vital science mission that will help us understand processes near the surface of the sun that affect space weather and radiation environments. We look forward to successfully delivering this critical spacecraft to orbit for NASA."

The Solar Probe Plus mission is scheduled to launch in July 2018 from Space Launch Complex-37 at Cape Canaveral Air Force Station in Florida. This mission will launch aboard a Delta IV Heavy, vehicle which features a center common booster core along with two strap-on common booster cores. Each common booster core is powered by the RS-68 cryogenic engine. An RL10 cryogenic engine will power the second stage. Due to the extremely high energy required for this mission, the Delta IV Heavy's capability will be augmented by a powerful third stage provided by Orbital ATK, based on the flight proven Star-48 solid rocket motor.

"ULA has considerable successful experience integrating third stages on top of our already capable vehicles," Spornick added. "We did something very similar when we launched the New Horizons mission, which will fly by Pluto and its moons later this year. We are proud to have Orbital ATK as our teammate for the development of the third stage for the SPP mission."

Solar Probe Plus will repeatedly sample the near-sun environment, revolutionizing our knowledge and understanding of coronal heating and of the origin and evolution of the solar wind and answering critical questions in heliophysics that have been ranked as top priorities for decades. The probe will make direct, in-situ measurements of the region where some of the most hazardous solar energetic particles are energized.

**America's #1 Space Launch Provider – United Launch Alliance – Talks**



## Innovations Including New Launch Vehicle at Lower Cost, Higher Capability and Unmatched Reliability

### CEO Says Efforts to Prematurely Halt the RD180 Engine “Uncompetitive” and a Threat to Assured Access to Space

**Washington, D.C., (March 17, 2015)** – United Launch Alliance (ULA) President and CEO Tory Bruno testified today to the U.S. House of Representatives Committee on Armed Services, Subcommittee on Strategic Forces, regarding the future of space launch and how his company is innovating and transforming to provide more affordable space launch services.

Bruno noted that space systems are an integral part of today’s technology-driven world and are critical to not only our national security, but to the country’s economic prosperity and scientific advancement. ULA’s launch record of reliable, on time, on or under budget, and 100 percent mission success position ULA to remain the undisputed leader of this industry. In addition, a report released by the GAO last week confirmed that ULA’s collaboration on improved acquisition for the Air Force through a five-year block buy resulted in \$4.4 billion in savings for the Evolved Expendable Launch Vehicle (EELV) program, accounting for one quarter of the total savings.

During his testimony, Bruno noted that only ULA has the capability to launch all of the nation’s assets, which means that it is critical that ULA maintain its supply of the RD-180 engine that is the workhorse of the Atlas launch vehicle until the new launch system is in place. The new launch system, which includes an American-made engine, is expected to produce its first flight in 2019 with full certification in 2022-2023.

“If the RD-180 is prematurely cut off before a new engine and vehicle is certified, there will be no other launch provider who can perform the full range of launch capabilities currently required under the law,” Bruno said referring to Assured Access to Space, which requires that the nation maintain two launch vehicles at all times to support the nation’s launch requirements. “The current narrow interpretation of the Defense Authorization bill, could preclude ULA from receiving previously ordered engines, which means the Air Force would only have one provider. Not only is that anti-competitive, it puts the Air Force national security mission requirements at risk.”

“The space launch industry is entering a new era and we couldn’t be more excited about our role in transforming

the nation’s launch capabilities,” said Bruno, a 30-year veteran of the rocket industry. “ULA knows what it takes to provide assured access to space, and we’re very proud to be the nation’s provider. We are building on that success by creating a next-generation launch vehicle that will maintain all the reliability and heritage of the Atlas and Delta, but will be more affordable with higher capability to meet the country’s future needs.”

ULA has consistently delivered 100 percent mission success for 94 consecutive launches and is currently at a tempo of greater than one launch per month. ULA’s Atlas V and Delta IV rockets are the most powerful and most reliable in the world, and are the only rockets that fully meet the needs of the national security community.

## United Launch Alliance Successfully Launches Solar Probes to Study Space Weather for NASA



**Cape Canaveral Air Force Station, FL, (March 13, 2015)** – A United Launch Alliance (ULA) Atlas V rocket carrying the Magnetospheric Multiscale (MMS) payload for NASA lifted off from Space Launch Complex-41 at 10:44 p.m. EDT on March 12, 2015. This launch marks ULA’s third launch of 13 planned for 2015, and the 94th successful mission since the company was formed.

“It is our honor to launch this mission that will study the physics of magnetic reconnection. This energy process is one of the key drivers of space weather which affects communication networks, like GPS navigation and electrical power grids here on earth,” said Jim Spornick, ULA vice president, Atlas and Delta Programs. “Congratulations to the NASA Launch Services Program team, the NASA Goddard Space Flight Center team, Southwest Research Institute, all of our mission partners and the entire MMS team on this successful launch of the MMS constellation.”

This mission was launched aboard an Atlas 421 configuration vehicle, which includes a 4-meter-diameter

payload fairing along with two Aerojet Rocketdyne solid rocket boosters attached to the Atlas booster. The Atlas booster for this mission was powered by the RD AMROSS RD-180 engine, and the Centaur upper stage was powered by the Aerojet Rocketdyne RL10A engine. This is ULA's fourth launch of the 421 configuration and NASA's 12th mission to launch on an Atlas V rocket.

MMS is a NASA Solar Terrestrial Probes mission consisting of four identical science observatories whose objective is to understand the microphysics of magnetic reconnection. The four MMS observatories are designed, built, and operated by NASA's Goddard Space Flight Center (GSFC) in Greenbelt, Maryland and a science and instrument team led by Southwest Research Institute (SwRI) in San Antonio, Texas.

ULA's next launch is the Delta IV GPS IIF-9 mission for the United States Air Force, scheduled for March 25 from Space Launch Complex-37 from Cape Canaveral Air Force Station, Florida.

## United Launch Alliance Successfully Launches Important Earth Science Mission for NASA

### Four Educational CubeSats Launched as Secondary Payload



**Vandenberg Air Force Base, CA, (Jan. 31, 2015)** – A United Launch Alliance (ULA) Delta II rocket carrying the Soil Moisture Active Passive (SMAP) payload for NASA lifted off from Space Launch Complex-2 at 6:22 a.m. PST today. This launch marks ULA's second launch of 13 planned for 2015, and the 93rd successful mission since the company was formed.

"Congratulations to the NASA Launch Services Program team, JPL and all of our mission partners on today's successful launch of the SMAP satellite," said Jim Spornick, ULA vice president, Atlas and Delta Programs. "It is our honor to launch this important Earth science mission to help scientists observe and predict natural hazards, and improve our understanding of Earth's water, energy, and carbon cycles."

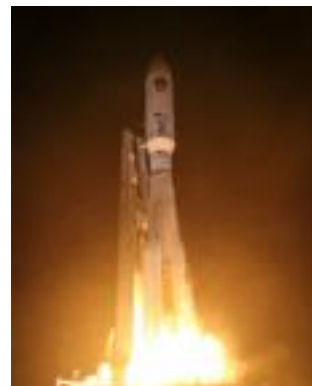
The SMAP mission was launched aboard a Delta II 7320 configuration vehicle featuring a ULA first stage booster powered by an Aerojet Rocketdyne RS-27A main engine and three Alliant Techsystems (ATK) strap-on solid rocket motors. An Aerojet Rocketdyne AJ10-118K engine powered the second stage. The payload was encased by a 10-foot-diameter composite payload fairing.

In addition, the Delta II delivered four educational cubesats as part of NASA's Educational Launch of Nanosatellite (ELaNa) initiative.

The SMAP mission is NASA's first Earth-observing satellite mission designed to collect global observations of surface soil moisture and its freeze/thaw state, data that have broad applications for science and society.

ULA's next launch is the Atlas V Magnetospheric Multiscale (MMS) mission for NASA, scheduled for March 12 from Space Launch Complex-41 from Cape Canaveral Air Force Station, FL.

## United Launch Alliance Successfully Launches the U.S. Navy's Mobile User Objective System-3



**Cape Canaveral Air Force Station, FL, (Jan. 20, 2015)** – A United Launch Alliance (ULA) Atlas V rocket carrying the third Mobile User Objective System satellite for the United States Navy launched from Space Launch Complex-41 at 8:04 p.m. EST today. The MUOS-3 spacecraft will ensure continued mission capability of the existing Ultra High Frequency Satellite Communications system that will provide improved and assured mobile communications to the warfighter.

"The ULA team is honored to deliver this critical mission into orbit for the U.S. Navy and U.S. Air Force with the support of our many mission partners," said Jim Spornick, ULA vice president, Atlas and Delta Programs. "The MUOS-3 spacecraft is the heaviest payload to launch atop an Atlas V launch vehicle. The Atlas V generated more than two and half million pounds of

thrust at liftoff to meet the demands of lifting this nearly 7.5-ton satellite. Today's launch was the 200th Atlas-Centaur launch – a very sincere congratulations to the many women and men responsible for the incredible success of the Centaur upper stage over the last 5 decades!"

This mission was launched aboard an Atlas V Evolved Expendable Launch Vehicle (EELV) 551 configuration vehicle, which includes a 5-meter diameter payload fairing along with five Aerojet Rocketdyne solid rocket motors attached to the Atlas booster. The Atlas booster for this mission was powered by the RD AMROSS RD-180 engine and the Centaur upper stage was powered by the Aerojet Rocketdyne RL10C-1 engine. This is ULA's 1st launch in 2015, the 52nd Atlas V mission and the fifth Atlas V 551 launch.

MUOS is a next-generation narrowband tactical satellite communications system designed to significantly improve ground communications to U.S. forces on the move and around the globe.

ULA's next launch is the Delta II Soil Moisture Active Passive (SMAP) mission for NASA scheduled for Jan. 29, 2015, from Space Launch Complex-2 at Vandenberg Air Force Base, CA.

With more than a century of combined heritage, United Launch Alliance is the nations most experienced and reliable launch service provider. ULA has successfully delivered more than 90 satellites to orbit that provide critical capabilities for troops in the field, aid meteorologists in tracking severe weather, enable personal device-based GPS navigation, and unlock the mysteries of our solar system.

For more information on ULA, visit the ULA website at [www.ulalaunch.com](http://www.ulalaunch.com), or call the ULA Launch Hotline at 1-877-ULA-4321 (852-4321). Join the conversation at [www.facebook.com/ulalaunch](https://www.facebook.com/ulalaunch), [twitter.com/ulalaunch](https://twitter.com/ulalaunch) and [instagram.com/ulalaunch](https://www.instagram.com/ulalaunch).

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**Following photos were taken at:**

MARS Annual Meeting – March 4, 2015

## MARS ASSOCIATES EVENT SCHEDULE

DATED: April 2015

EVENT/MONTH	2015									2016		
	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Board of Directors		6		1		1		4		6		2
Officers	1	6	3	1	5	1	7	4	1	6	3	2
Bridge	17	15	19	17	21	18	16	20	18	15	19	18
Dinner	15	19	15	15	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Golf	Thur	Thur	Thur	Thur	Thur	Thur	Thur	Thur	Thur	Thur	Thur	Thur
Photo	9	14	N/A	N/A	N/A	10	8	12	10	14	11	10
Hiking Club	15	20	17	15	19	16	21	18	16	20	17	16
Computer Discovery	10&24	8&22	12&26	10&24	14&28	11&25	9&23	13&27	11&TBD	8&22	12&26	11&25
Web Committee	3/31	5	2	6/30	4	8/31	6	3	11/30	5	2	1
CO Rockies Game			10									
Sr. Luncheon				8								
Annual Picnic						2						
Holiday Celebration									2			
Annual Meeting												TBD
Items due for MARS STAR												
STAR Input	3/30		6/29			9/28						
STAR Repro. Deadline	13			20			12					
STAR Mailing	22			29			21					

1. BOD meets the first Wednesday of every other month at The Egg & I near Southglenn at 09:30 a.m.
2. Officers meet the first Wednesday of every month at The Egg & I near Southglenn at 09:30 a.m.
3. Bridge Club meets the third Friday of every month at 10:00 am at Buck Recreation Center.
4. Dinner Club – April 15 – Arrowhead Golf Club – Lunch; May 19 – Garden Terrace @ Inverness – Lunch; June 15 – No No's Café – Dinner; July 15 - Mt. Vernon Country Club – Lunch
5. Golf meets every Thursday from April through Oct of each year.
6. Photo Club meets the second Thursday of every month (except Jun, Jul & Aug) at 1:30 pm at the Bemis Public Library in Littleton.
7. Hiking Club: Outings on third Wednesday of the month. Check the website for place and time.
8. Computer Discovery volunteers meet at 1:00 pm the 2nd and 4th Friday of the month – all meetings at Buck Recreation Center.
9. Web Committee meets at Noon at Sweet Tomatoes on West Bowles, Littleton, on the Tuesday prior to BOD and/or Officers meeting.
10. 2015 MARS Day at the Rockies – June 10
11. 2015 Sr. Luncheon – July 8 at Inverness Hotel
12. 2015 Annual Picnic – September 2 at Clement Park
13. 2015 Holiday Celebration – December 2 at Pinehurst Country Club
14. 2016 Annual Meeting – TBD

Please review dates and times and notify Robin Valore (rrvalore@gmail.com) if you have any changes or additions.