

SCITECH FORUM 7-11 JANUARY  
2019  
SAN DIEGO, CA

REGISTRATION IS OPEN

Apollo 8, Page 8

**Educator Grant  
Deadline Jan. 11!  
See page 10**

**March 20, 2019**

*Congressional Visitors Day (CVD)*

Washington, D.C.

[More info](#)

**March 11, 2019**

*Colorado Aerospace Day*

Colorado Capitol, Denver, CO

[More Info \(when available\)](#)

**January 7-11, 2019**

*AIAA SciTech*

San Diego, CA

[Register](#)

## Note from the Editor

Adrian Nagle, *Ball Aerospace*

In October, AIAA Rocky Mountain Section put on another wonderful Annual Technical Symposium. Thank you to all who organized and executed the symposium and especially the attendees that made this symposium the most attended so far. Read more about the details of the symposium in the next newsletter.

Meanwhile other programs are planned. Keep an eye on your e-mails for new speaker program early next year. Plan ahead for Congressional Visitor Day and Colorado Aerospace Day in March. Don't forget about AIAA National's SciTech in San Diego, Jan. 7-11, 2019. Registration link is listed on the left.

Rocky Mountain Section is a very active group and I appreciate the help we have that encourages students to think about careers in aerospace. Please consider helping by responding to requests for help, or even offering your help to the committee chair for STEM and Education Outreach (Brandon Walls, [brandonjwalls@gmail.com](mailto:brandonjwalls@gmail.com)).

Be aware AIAA has a new website called Engage. See how you can add a profile picture to your account on page 8. I hope to meet you at any of our future events.

Happy Holidays,  
Adrian

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## SECTION OFFICERS

### Elected

|                          |                    |
|--------------------------|--------------------|
| Section Chairman         | Dr. Rusty Powell   |
| Chairman Elect           | Dr. Merri Sanchez  |
| Secretary                | Kevin Mortensen    |
| Treasurer                | Dr. Taylor Lilly   |
| Vice Chairman – North CO | John Marcantonio   |
| Vice Chairman – South CO | Dr. Todd Nathaniel |
| Vice Chairman – MT       | Erik Eliassen      |
| Vice Chairman – WY       | Mark Kettles       |

### Committees

|                             |               |
|-----------------------------|---------------|
| Fellow-At-Large             | Gene Dionne   |
| Member-At-Large             | Pamela Burke  |
| Education and STEM          | Brandon Walls |
| Honors and Awards           | Stacey DeFore |
| Membership                  | Marshall Lee  |
| Newsletter Editor           | Adrian Nagle  |
| Public Policy               | Tracy Copp    |
| Pre-College Outreach        | <b>OPEN</b>   |
| Programs                    | Chris Zeller  |
| Technical Committee Liaison | <b>OPEN</b>   |
| Webmaster                   | John Grace    |
| Young Professionals         | <b>OPEN</b>   |

## We Need You!!

If you are interested in increasing your participation in AIAA Rocky Mountain Section, we need your help with positions in any of the committees. If you have an interest, please contact: Kevin Mortensen – [kevin.mortensen@baesystems.com](mailto:kevin.mortensen@baesystems.com)

### Tickets to Space From Colorado?

The Front Range Airport became the Colorado Air and Space Port after a site operator license was granted by the FAA August 2018. The Colorado Air and Space Port is located 7 miles southeast of Denver International Airport near Watkins, CO. According to the [Denver Business Journal](#), “Colorado Air and Space Port will accommodate vehicles making horizontal takeoffs and landings. The vehicles will take off like traditional airplanes using jet fuel and fly to a special-use airspace where rocket boosters launch the craft into suborbital flight. To land, the craft drops out of suborbital flight and lands like a traditional airplane.” The next step is for an approved business with approved equipment to locate to Colorado’s new space port.

## AIAA-RM Members at STEAM Festival

Sally Hanley, *Sierra Nevada Corporation*



John Mercantonio, John Niehues, Jenni Harris, Libby Booton, Blake Watters, and Sally Hanley represented the AIAA Rocky Mountain Section at the Wings Over the Rockies Air and Space Museum's annual STEAM For All Festival on September 15th.

The event was open to the public and presented engaging and hands-on activities dedicated to getting everyone involved in science, technology, engineering, arts, and mathematics. The target audience was students ages 8 and up, but a wide range of both students and adults attended. Workshop sessions were also offered to enable students to interact hands-on with specific subjects, including robots and virtual reality.



The keynote speaker at the event was Tracy "JackieO"

LaTourrette, Colorado's "First Lady" fighter pilot and one of the first women in the world to fly fighter aircraft. She graduated from the US Air Force Academy in Colorado Springs and has flown missions globally as a

combat mission-ready F-16 fighter pilot. Lieutenant Colonel LaTourrette retired after 22 years while serving as the Deputy Director of Operations at the Colorado National Guard's Joint Force Headquarters.

The AIAA RM volunteers shared information about careers in the aerospace industry, answered questions about what it's like to work as an aerospace engineer, and shared information about some of the work that AIAA members do - including Lockheed Martin's Orion and SNC's Dream Chaser spacecraft. The volunteers handed out swag, including aerospace career information; AIAA stickers, notebooks, crayons, and bags; and SNC paper airplanes, stickers, and coloring pages. John Marcantonio also led two workshops that showed kids how to delve into cupcakes and related it to techniques that NASA uses for planetary surface exploration.

Other presenters at the festival included Colorado State University, NOAA, Questbotics, Girls Who Code, iFly Denver, Air Force Reserves, MSU Denver, STEMPunk, and ULA. For more information on the event, visit: <https://wingsmuseum.org/event/steam/>



## TRAJECTORIES 2018 Inspires Aerospace Careers

Marshall Lee, *Sypris Electronics, LLC*

RMS AIAA and Mines Aerospace Interest Group (MAIG) hosted the second annual networking event TRAJECTORIES 2018 at the Colorado School of Mines on Friday, October 19. Career path inspiration was the resonating theme delivered by the event's three speakers. To kick things off, Colorado's Aerospace and Defense Industries Champion, Ret. Maj. General Jay Lindell shared inspiring opening comments about the significance of the Colorado Aerospace Community in the US. Around 100 attendees comprised of students and professionals enjoyed delicious, free hors d'oeuvres and drinks while networking before and after the presentations. The presentation session concluded with a Q&A

covering the speakers' best advice when developing your own career trajectory.

Hunter Williams led the presenters by mapping out his career experiences at Lockheed Martin and Colorado School of Mines (CSM). He provided not only what is possible out there in aerospace, but delivered sage advice to the future job seekers in attendance – at an interview, relax and show your best self; don't burn bridges – you might go back; and, become a colonist on Mars! Hunter also talked about some of the CSM projects related to Space Resources program including asteroid mining, moon mining, and 3D print regolith.

Melissa Sampson, Sr. Advanced Systems Manager from the Commercial Aerospace & Strategic Technology group at Ball Aerospace presented "Building a Successful Career in Aerospace". In her new role at Ball to promote Cislunar Business Development, Melissa explained her multi-faceted career

path being associated with William & Mary, University of Colorado, Lockheed Martin, ULA, BioServe, AIAA, SWE, and Ball. She offered three key elements of a successful career – be a mentor (more than one mentor is good) or mentee, be flexible (roles and opportunities are ever changing), and speak up (your ideas are valuable, share them).



Finally, Dr. Jeannette Domber, Program Manager from Ball Aerospace's Civil Space Division told the story of the Wide Field InfraRed Survey Telescope (WFIRST). In pursuit of humankind's unanswered questions such as "What is the universe made of?" and "What is the fate of the universe?" and "Are we alone?", Dr. Domber discussed how we've evolved from Hubble, James Webb and now to WFIRST. With Hubble, the telescope had to capture some 400+ pointings to equal what WFIRST can accomplish in just 2 pointings. WFIRST will survey nearby galaxies 100x faster than Hubble, to help us better understand astrophysics, exoplanets, and dark energy.

Rocky Mountain Section of AIAA would like



to thank MAIG, Colorado School of Mines President Dr. Paul Johnson, along with the Mines Alumni Associate for their support to make this event a tremendous success. In addition, AIAA would like to give a special thanks to the key organizer from MAIG, Shawn Koblinski, Orion Program at Lockheed Martin for his effort to pull this event together.



Look for and do not miss **TRAJECTORIES 2019** in September next year to help refuel your aerospace network!

## AIAA New Associate Fellows

Gene Dionne, *Retired – USAF and Lockheed Martin*

The American Institute of Aeronautics and Astronautics (AIAA) announced its Class of 2019 Associate Fellows in September. AIAA will formally honor and induct the class at its AIAA Associate Fellows Recognition Ceremony and Dinner on Monday, 7 January 2019, at the Manchester Grand Hyatt San Diego in San Diego, California, during its 2019 AIAA Science and Technology Forum and Exposition.

“I am proud to welcome the Class of 2019 to the ranks of Associate Fellows—which is an esteemed roster of aerospace professionals,” said John Langford, AIAA president. “Their dedication to their fields has set them apart, and they have been recognized by their peers as inspiring colleagues and mentors. I look forward to honoring their achievements at the 2019 AIAA SciTech Forum in January.”

The grade of Associate Fellow recognizes individuals “who have accomplished or been in charge of important engineering or scientific work, or who have done original work of outstanding merit, or who have otherwise made outstanding contributions to the arts, sciences, or technology of aeronautics or astronautics.” To be selected as an Associate Fellow an individual must be an AIAA Senior Member in good standing, with at least twelve years professional experience, and be recommended by a minimum of three current Associate Fellows

or Fellows. “Each year, current AIAA Associate Fellows recognize the hard work, commitment, and innovative spirit of their colleagues and make them one of their own,” said Dan Dumbacher, AIAA executive director. “AIAA Associate Fellows, as a group, are committed to pushing boundaries and testing new theories, resulting in the best ideas that can help transform aerospace across industry, academia, and government.”

The three Associate Fellows from the Rocky Mountain Section are:

**Heidi Hallowell** of Ball Aerospace in Boulder. Heidi has been a lead Attitude Guidance, Navigation, and Controls subsystem (ADACS) Engineer since Dec. 2002 on programs such as Cloudsat, Suomi-NPP, JPSS-1, EPOXI – Deep Impact follow-on, NPP ADACS development, STP/SIV-2 and MTI programs. Before that (1999-2002) she was at Digital Globe where she was responsible for ADACS on the QB2 spacecraft from Integration and Test through launch, commissioning, and on-orbit operations. From 1996 to ‘99 she was at LM Space as a control systems analyst on the Atlas V program and several spacecraft including the Mars Climate Orbiter, Mars Polar Lander, and the Stardust program. Heidi is the Chair for 2019 AAS Guidance and Control Conference at Breckenridge and is a Member of AIAA’s GN&C Technical Committee (May 2017-present). Heidi has a MSEE and BSEE (minor in physics) from University of No. Carolina in Charlotte.

**Dr. John Grunsfeld** is associated with the Goddard Space Flight Center, currently residing in Boulder. John has been an

astronaut, scientist, educator and space explorer. Since 2016, John has been researching Europa plumes through HST/SOFIA observations and promoting assembly and servicing of future space telescopes. From 2012 to '16 John was in the USG Senior Executive Service at NASA headquarters as the senior science official responsible for developing the overall research program and strategy for NASA science. In this role he worked closely with the NASA field centers, industry, and the scientific community including the National Research Council, and NASA Advisory Council including other Federal Agencies, Departments, and international partner agencies and scientists. From 2010 to '12 he was the Deputy Director and Senior Astronomer for the Space Telescope Science Institute, Research Professor Johns Hopkins University, and Association of Universities for Research in Astronomy. From 2003 to '04 he was the Chief Scientist, NASA Headquarters in Washington. From 1992 to 2010 he was a NASA Astronaut at NASA Johnson Space Center, Houston, TX. He flew five shuttle missions as a mission specialist including a total of 8 EVAs on three of those missions. From 1989 to '92 he was Senior Research Fellow, Faculty of Physics, Mathematics and Astronomy, California Institute of Technology where he led a research team in the investigation of X-ray binary pulsars, using the Gamma-Ray Observatory, ROSAT, optical and radio telescopes and built instrumentation for high-altitude balloon flights to observe high-energy cosmic sources. From 1987 to '89 he was the W.D. Grainger Fellow in Experimental Physics, University of Chicago

doing research centered on high-energy cosmic ray origin, acceleration and propagation, impulsive solar flares, cosmic ray interaction with the Earth's geomagnetic field, and X-ray and gamma-ray astrophysics and instrumentation. John has a Ph.D. and MS degrees in physics from the University of Chicago and BS in physics from MIT.

**Chad Hebert** of Sierra Nevada Corporation, Space Systems in Louisville. Chad is the Principal Engineer of the DreamChaser Program (Loads & Dynamics Group) where he leads a team of engineers to determine the loads and dynamic environments for the design of the DreamChaser Space Transportation System. He has been a member of the AIAA Structural Dynamics Technical Committee (SDTC) since 2000 and served as Vice Chair and Chair each for two years. While Mr. Hebert was the Chair of the SDTC Education Subcommittee, he provided innovative and original contributions to the AIAA education mission, with critical contributions to the "Exploring Structural Dynamics" DVD and website, and to the AIAA Outreach programs in general. Prior to his current position he was the Senior Structures Analyst - Space Technologies Group (2007-'12) leading analysts responsible for structures, dynamics and mechanical systems design and analysis functions on space mechanism and spacecraft programs. From 2004-'07, Chad was with NextGen Aeronautics, Torrance, CA where he was the Senior Engineer in structures, structural dynamics, mechanical and hydraulic system design and analysis functions for several aerospace related research and

development programs. Before that he worked for Wyle Laboratories Inc., El Segundo, CA where he was the Lead Dynamics Project Engineer performing theoretical and experimental analysis of structural and dynamic systems for various military and commercial aerospace companies. He has a MS in Aerospace Engineering from Pennsylvania State University and a BS in Aerospace Engineering from the University of Oklahoma.

**Dr. Marcus J. Holzinger** is an Associate Professor and the H. Joseph Smead Faculty Fellow in Aerospace Engineering at University of Colorado, Boulder. In his field of Space Situational Awareness (SSA), he has published 23 journal articles and 62 conference and workshop papers; of which the majority are in AIAA journals or AIAA-sponsored events. In particular, his theoretical and experimental research on active satellite attitude estimation using lightcurves, low-SNR detection & tracking using electro-optical sensors, and hypothesis-driven sensor tasking have been particularly impactful in SSA, and promise meaningful improvement over current state-of-the-art space surveillance network operations. Previous to his arrival this summer at CU, Marcus led a robust and impactful research program for six years at Georgia Tech where he taught and advised/directed the efforts of 7 PhD, 7 MS

and ~25 BS students. He was honored with a Grainger Foundation Award (2018, administered by the National Academy of Engineering), an AFOSR Young Investigator Program award (2017), a Northrop Grumman Space Technology Innovation Award (2008), and was selected by the National Academy of Engineering to participate in the US Frontiers of Engineering Symposium (2017), amongst others. While at Georgia Tech, he was granted tenure and promotion to Associate Professor.

Marcus has served as a Guest Editor for the AIAA JGCD special issue on Space Domain Awareness, an Associate Editor for the AIAA/IEEE American Control Conference, been recognized as AIAA JGCD 'Excellent Reviewer' multiple times, and served as a panel moderator, session chair, or co-chair at 12 AIAA-sponsored technical conferences and is presently serving on the AIAA Astrodynamics Technical Committee. Marcus serves as Secretary of the AAS Space Surveillance Technical Committee, and has completed a term of service on the AAS Spaceflight Mechanics TC. Marcus' Ph.D in Aerospace Engineering Sciences was awarded from CU Boulder, he has a Masters in Aeronautics and Astronautics from University of Washington and BS in Aeronautics and Astronautics (minor in Mathematics) also from University of Washington, Seattle.



## Completing Your AIAA Profile – Add a Picture! (preferably of you)

John Grace, *Lockheed Martin Space (Retired)*

If you have not recently visited the Rocky Mountain Section website, please go to <http://aiaa-rm.org> and bookmark. This link

will re-direct you to the new AIAA Engage site

(<https://engage.aiaa.org/rockymountain/home>) to complete these steps:

NOTE: you will not break Engage, so give it a try!

- This is the hardest step.... locate a picture of yourself or take a selfie. (you can change it later)
- Click "Sign In" in the upper right corner. If your AIAA membership is current, enter email address and password.
- Click the down arrow to the right of the gray silhouette and then click "Profile".

- The next page shows a larger gray silhouette on the left side of the screen. Click "Actions", then "Change Picture"

- A portal opens where you may "Drag and Drop" or "Copy and Paste" your picture. If necessary, "rotate" and "crop" the photo. You may only need to adjust the "square" to center your face.

- Click "Save". Adjust the display by clicking "Reset".

- When satisfied, click "Upload". The page reloads to display the photo on the left side and the top-right. Easy-peasy, you're done!



## Apollo 8 a Success 50 Years Ago!

*Adapted from a New York Times article by Gene Dionne.*

On Dec. 21, 1968 NASA launched Apollo 8, the second manned mission in the Apollo lunar program and the first mission to orbit the moon, from the Kennedy Space Center in Florida on a Saturn 5 vehicle. It was carrying astronauts Frank Borman, the commander; James A. Lovell Jr, the command module pilot; and William Anders, the lunar module pilot. All objectives of the mission were met:

demonstrating the performance of a lunar orbit rendezvous, including command service module navigation, communications and mid-course corrections; and command service module thermal performance and many other mission activities. The Apollo 8



Photo credit: NASA

astronauts became the first men to leave Earth's gravitational field and to enter into a temporary orbit around the moon.

They also conducted the first TV transmissions of pictures of Earth (remember the iconic "Earthrise?") and on the fourth day of the mission, on Christmas Eve, they interrupted communications with the Earth to concentrate on being the first humans to see the far side of the moon. Thousands of pictures were taken of the

lunar surface and prospective landing sites for subsequent Apollo missions. On the fifth mission day, while completing the spacecraft's 10th revolution, a service propulsion system engine was fired that increased the spacecraft's velocity and propelled Apollo 8 back to Earth, with a recovery made precisely on schedule in the Pacific Ocean, close to the recovery ship USS Yorktown on Dec. 27th. What a mission!



## Educators Find Benefits For Your Classroom – Grant Submission Deadline is Jan. 11, 2019!

Adrian Nagle, *Ball Aerospace*

Help other educators be aware of the free AIAA Educators membership. Sign up at the [AIAA website](#).

Check out this list of resources:

- [Educator Academy](#) - The AIAA Educator Academy is designed as a standards-based hands-on program to involve students in creating solutions to real-world problems. From landing a rover on Mars to perform scientific discoveries, to the proper weight and balance of a cargo airplane in flight, to exploring the bounds of the atmosphere with a space weather balloon, these modules are meant to excite your students and encourage them to seek additional answers to the questions posed by the curriculum.
- [Micro Lessons](#) - These lessons are easily digestible lessons focused on aerospace principles. Each lesson is broken down into grade levels and are meant to spark conversation and interest in aerospace.
- [AIAA Foundation Classroom Grants](#) - opportunities for teachers to supplement their lesson plans with hands-on science, technology,

engineering, and mathematics activities that actively engage students in creative and innovative projects, and often provides funding for programs that may have been cut from school budgets. The AIAA Foundation Classroom Grant program is one of the best resources that teachers turn to for activities assistance, and awards \$250 grants to up to 40 teachers annually.

- [AIAA Rocky Mountain Section \(RMS\)](#) - serves CO, WY, MT where you will receive emails about our events you and students are welcome to attend
- RMS STEM and Education Outreach committee - group of volunteers who can help you find classroom speakers, mentors for projects, and local resources (Brandon Walls or Sue Janssen)

AIAA Foundation Classroom Grant submission period **ends JANUARY 11, 2019**. The grants have special rules (<https://www.aiaa.org/classroomgrants/>) and are available for K-12 to current educator members for programs with a clear connection to science, technology, engineering or mathematics and with an emphasis in Aerospace. Grants will help with classroom demonstration kits and supplies, software, math materials, and supplies for robotics and preparing flying objects. Follow this link to review more details and apply for a grant.

**APPLY NOW**