

**Save Date for
Young Professional
Event!**

February 21, 2018

Program Speaker Series: Lucy
Lockheed Martin, Denver, CO

March 19, 2018

Colorado Aerospace Day
Denver, CO

March 21, 2018

Congressional Visits Day
Washington, D.C.

March 22, 2018

3rd Annual Aerospace Summit
Location TBD

April 27, 2018

Honors and Awards Banquet
The Falls, Littleton, CO

May 10, 2018, 6-10pm

*Young Professionals Event: "Hidden
Figures Movie" with guest speaker Dr.
Christine Darden*
Alamo Draft House Cinema, Littleton,
CO

Note from the Editor

By Adrian Nagle, *Ball Aerospace*

Yes, you are receiving another newsletter sooner than you expected! There is much activity ahead of us at AIAA Rocky Mountain Section.

First, Speaker Program Series is continuing in February after the engaging January program as MSU. February's program will discuss the Lucy mission to Jupiter on Feb. 21.

Then plan to attend the Annual Honors and Awards Banquet April 27 at the Falls Event Center in Littleton. Here we recognize those in our organization. An AIAA distinguished speaker, Lt. Col. Hamilton, will discuss his experience with the F-35 Lightning II.

This newsletter should hopefully pique your interest in helping with STEM programs in our region. Please consider helping as you encourage young people to consider engineering and help them be amazed at the possibilities they can only dream about.

The Young Professionals committee is planning a movie event with the movie "Hidden Figures" and special guest speaker Dr. Christine Darden. See the save the date advertisement in this newsletter for more details.

I hope to meet you at any of these events!

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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

Aerospace in Denver News

Feeling like your aerospace office is becoming more crowded? The Colorado aerospace industry has been in the general news declaring considerable job growth. According to a [news story](#) on The Denver Channel 7 website, job growth was 4.7% for the aerospace industry that has 26,620 private sector jobs. That high growth statistic mentioned in the article makes Colorado the second largest aerospace employment state.

AIAA-RM Continues STEM Outreach Support

Brandon Walls, *Lockheed Martin*

This year, Rocky Mountain Section's Education and STEM Outreach group will be continuing to support many annual events, hosting some of our own, and even developing some new offerings and capabilities!

Some recent opportunities we had the fortune of supporting include Girls STEAM Day at Wings Over the Rockies, Elk Creek Elementary School's Science Expo, and the BEST Robotics Regional Competition. Girls STEAM Day at Wings Over the Rockies

incorporates a number of engaging and hands-on STEAM activities to promote and empower girls toward careers in STEAM. The Elk Creek Elementary School's Science Expo is an unstructured and open-ended opportunity for kids to explore interesting scientific questions and engage with discovery. BEST Robotics is a non-profit organization dedicated to providing free robotics competitions to middle and high-school students. The teams are only allowed to use a standard set of hardware and equipment, which ensures winning is a true feat of design and skill. All these events, and more, recur on a yearly basis. If any of these sound interesting, please keep us in mind for later this year!

Additionally, some upcoming events include the 2018 Space Systems AIAA Essay Contest



Figure 1 - Sue Janssen supporting the AIAA RMS Booth at the BEST Robotics Regional Championships, Dec 16th

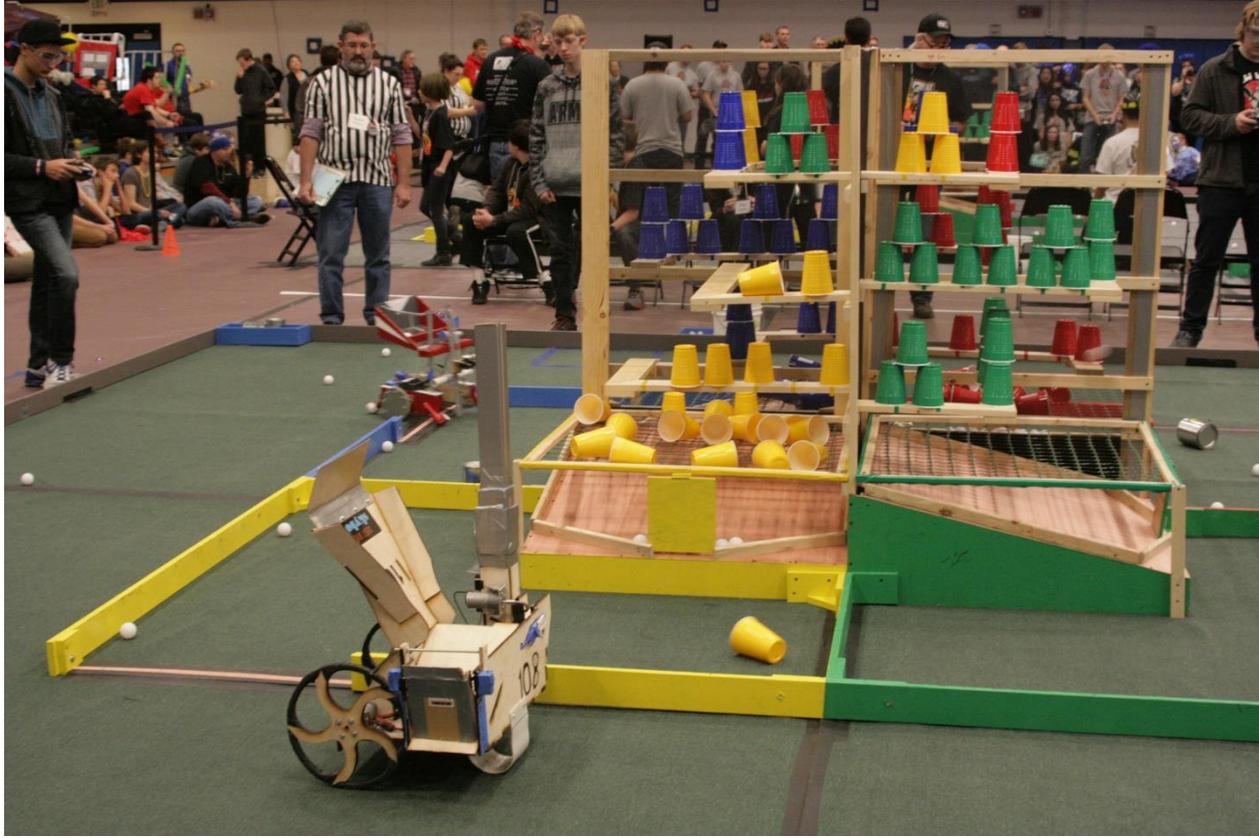


Figure 2 - Match In progress at BEST Robotics Regional Championships, Dec 16th

(April), the Wyoming State Science Fair (March 4-6) and Colorado State Science Fair (April 6-7), and Girls Exploring STEM (May 18). The AIAA and the Space Systems Technical Committee hold an annual Space Systems Essay Contest, and this year's essay contest is about Astronauts and their impact to NASA, the future of the U.S., and international partnerships. The Wyoming and Colorado State Science Fairs will once again showcase top-notch science and engineering research from across both states respectively. Girls Exploring STEM is another fantastic STEM outreach event hosted by the Society of Women Engineers to provide a day of hands-on STEM workshops to 7th grade girls, again encouraging careers in STEM.

Finally, we have a few near term projects to be implemented as well. The first will be an improved Calendar of Volunteering Events, to make it even easier to find ways for you participate in the events you enjoy! Another will be introducing regularly occurring Engineers as Educators events, which will help connect students to professionals and give the opportunity to do some extracurricular learning. Upcoming events will be added to the [Educational Outreach Calendar](#) to include dates, locations, information, and POCs, so please check back frequently! Overall, 2018 is shaping up nicely, and we hope to see you this year!

Brandon Walls, Educational Outreach Officer (brandonjwalls@gmail.com)

CO Middle School Students Build and Launch Student Payload

Press Release, *Blue Origin*

CASTLE PINES, Co. — December 13, 2017 - An experiment by DCS Montessori middle school students ended with success aboard the Dec. 12, 2017 sub-orbital rocket research flight by private space company Blue Origin.

The student payload consisted of two parts. The first included an Arduino Nano with a sensor package, designed and programmed by the students. The second part contained a school-wide art project that all DCS Montessori students participated in. Upon landing, the data from the experiment will be analyzed and the art will be returned to the students and shared with the community.

DCS Montessori partnered with DreamUp, the leading provider of space-based educational opportunities, to develop a custom curriculum, using this flight opportunity as a teaching moment and engaging as many students as possible with elements of the payload development.

To maximize impact, the middle school students were split into 4 groups, responsible for designing and building the payload enclosure; developing and testing the experiment; generating and organizing a school-wide art project that would enable all students at the school to create something that would be sent into space; and developing an age-appropriate lesson to share with the preschool, lower elementary, and upper elementary students. By engaging the entire school in various aspects of the suborbital experiment, the students were exposed to a real-world challenge that incorporated Science Technology Engineering Art and Mathematics (STEAM) in a powerful and effective way.

This payload flew on-board Blue Origin's New Shepard space vehicle. The sub-orbital rocket flew through the middle atmosphere, an altitude

of 31 miles to 62 miles known as the mesosphere and lower thermosphere. The New Shepard vertical takeoff and vertical landing vehicle is capable of carrying hundreds of pounds of payloads per flight and will ultimately carry six astronauts to altitudes beyond 100 kilometers, the internationally recognized boundary of space.





Development and launch of the student experiment was made possible by funding provided by DCS Montessori School and sponsorships from the Rocky Mountain Section of American Institute of Aeronautics and Astronautics (AIAA) and Kimley-Horn, one of the nation's leading design engineering firms. Significant support was provided by DCS Montessori middle school teachers Mike Catalano and Nicole Gassman who integrated the curriculum into their already busy school year, and by industry volunteers such as Brian Gulliver, who worked directly with the students.

"It was enjoyable to work with such talented students during the development of the experiment and payload enclosure," said Brian Gulliver, the Aerospace and Spaceport Leader at Kimley-Horn and

Associates. "This is a once in a lifetime opportunity for many of the students to be able to create something that goes into space and all the students are very excited to get their experiment and art back."

"In order to have a world where we live and work in low Earth orbit or beyond, we need a workforce prepared to perform all types of activities in space," said Carie Lemack, Cofounder and CEO of DreamUp. "We are honored to work with Blue Origin and schools like DCS Montessori to inspire and engage the next generation of innovators and explorers."

"We are delighted to be providing a full range of educational experiences on New Shepard, from K-12 outreach to Ph.D.-level research. Congratulations to DreamUp and

DCS Montessori for helping student dreams take flight!" said Erika Wagner, Blue Origin's Business Development Manager.

Contacts:

DreamUp: Carie Lemack, 617-335-3025, carie@dreamup.org

Blue Origin: media@blueorigin.com

About DreamUp:

DreamUp provides space-based educational and media services to students and entrepreneurs, with a mission to realize an educational community where space-based research and space-based projects will be available to all students, from primary to post-doctorate, to the International Space Station, and beyond. The first company bringing space into the classroom and the classroom into space, DreamUp is uniquely positioned to engage kids globally with the most cutting-edge space research and

developments, and inspire them through scientific discoveries in orbital and suborbital space. DreamUp has a proven track record, having brought over 375 student research payloads worldwide to the International Space Station (ISS) through our partnership with NanoRacks and its Space Act Agreement with NASA.

About Blue Origin:

Blue Origin, LLC (Blue Origin) is a private company empowered by a vision where millions of people are living and working in space. To achieve our vision, we strive to enable commercial human space transportation by developing reusable rocket engines and launch vehicles that will dramatically lower the cost of access to space. For more information and a list of job openings, please visit us at www.blueorigin.com.

AIAA RM Speaker Series October Program: High Precision Devices

Chris Zeller, *Ball Aerospace*

High Precision Devices (HPD) of Boulder presented to the Rocky Mountain Section at the October installment of our speaker's series. Kevin Miller director of business development at HPD showcased their various products and highlighted their experience with aerospace technologies and discussed how the company is

positioning itself as a provider of space flight hardware. Mr. Miller has led a distinguished career in aerospace flight programs at Lockheed Martin and Ball Aerospace before taking on the role of business development director at HPD. HPD provides a wide range of complex electro-optical and cryogenic systems as well as the control and monitoring hardware and software to operate these systems. HPD is the world leader in Adiabatic Demagnetization Refrigerator (ADR) cryostats, offering test platforms regulated at 100 mK. HPD also builds Dilution Refrigerator (DR) cryostats, both cryogen-free (dry) systems and liquid cryogen



systems. The HPD cryostats employ modular design offering the maximum flexibility for service and experimental adjustment.

HPD cryostats are functional and feature rich and lend themselves to fully customized designs. HPD also makes MRI phantom devices that are used to calibrate magnetic resonance imagers for medical use. HPDs aerospace applications include high precision electro optical mounts for which they built mechanisms for the BRISON balloon mission for Southwest Research Institute that was the subject of RM-AIAA's February 2014 program.

Members braved an early fall snowstorm to attend the program but those who made it

were rewarded with an overview of the HPD technologies followed by a tour of the assembly and manufacturing areas at HPD including their computer aided machining systems, parts kitting and electronics fabrication areas.

Programs Plan 2018:

- February 21, 2018, Lucy "A Mission of Discovery" at Lockheed Martin
Register by Feb. 19 at [Registration](#)

Contact programs chairperson Christopher Zeller with program ideas and suggestions.

(303) 939-4636 czeller@ball.com



AIAA-RM Young Professionals Movie Night

Join fellow aeronautics and astronautics enthusiasts for an evening of food, beer, cocktails, and networking!



GUEST SPEAKER: Dr. Christine Darden

Career mathematician, aeronautical engineer, and NASA researcher featured in the **Hidden Figures** book

Thursday
May 10th

Alamo Drafthouse
Cinema
7301 S Santa Fe Dr,
Littleton, CO 80120

6:00 - 10:00
In the Evening

SAVE THE DATE! More information regarding registration & attendance soon to follow

Tentative Itinerary:

FOOD, BEER, and COCKTAILS AVAILABLE AT ALL TIMES

Social/Networking Time: 6:00-6:40 PM

Dr. Christine Darden: 6:45-7:40 PM

Film Screening: 7:50-10:00 PM

Announcing Upcoming Honors and Awards Banquet

Taylor Lilly, *Lockheed Martin*

Every day individuals at our companies, at our schools, and in our everyday life exemplify service to the aerospace industry. Some of those individuals are implementing their technical skill in creating tomorrow's high-technology. Others are donating their time to inspire the next generation of astronauts to ride that technology to distant worlds. All told, there are thousands of individuals in the Rocky Mountain section worthy of recognition and praise. While many of these individuals will go on as unsung heroes in Aeronautics and Astronautics, the Rocky Mountain section would like to take an evening to recognize at least a few of the men and women who have made our industry better in the last year.

Please join us once again for the AIAA RMS Annual Honors and Awards Banquet on April 27, 2018. At this banquet, you'll enjoy dinner, optional bar service, the opportunity to socialize with members of the Rocky Mountain section, members of the recent class of AIAA Fellows and Associate Fellows, and enjoy a keynote topic by an AIAA Distinguished Speaker.

At this event we will be honoring the awardees for our annual four categories: Professional Engineer of the Year, Young

Engineer of the Year (under age 35), Educator of the Year (Collegiate), & Educator of the Year (K-12). Please look to your emails and the AIAA-RMS website for information on nominating. In addition to our annual awardees, we will also be acknowledging our newest class of AIAA Fellows and Associate Fellows residing here in the Rocky Mountain Section. These individuals have been recognized as national and international leaders in Aeronautics and Astronautics. We look forward to their attendance and the opportunity to learn from their experience and accomplishment in the industry.

Honors and Awards Banquet

April 27th, 2018 6-9 pm

Location:

[The Falls Event Center](#)

8199 Southpark, Littleton, CO 80120

Speaker: Tucker Hamilton, "F-35 Flight Test"

Nomination Forms: [AIAA-RM Website](#)

Also See **Call for Nominations** on last page of Newsletter.

Honors and Awards Banquet Speaker Lt. Col. Hamilton to Discuss F-35 Flight Testing



Lt Col Tucker "Cinco" Hamilton is an Experimental Fighter Test Pilot for the United States Air Force. Cinco started his Air Force career as an operational F-15C pilot. He supported multiple Red Flag Exercises and real world Operation Noble Eagle missions where he protected the President of the United States; at times escorting Air Force One. He then served as an Air Liaison Officer in Germany where he was the director of operations for a key command and control squadron. While serving in Germany he was hand-selected to be the

initial cadre for the first MC-12 squadron in Afghanistan; heralding in the Air Force's first tactical Intelligence, Surveillance, and Reconnaissance aircraft. He served as the Chief Instructor for 200+ aircrew and accumulated over 400 combat hours directly supporting ground forces. After his time in the MC-12 he attended the USAF Test Pilot School (TPS) where he flew 30 different aircraft, wrote 38 technical reports, and took part in the first Automatic Air Collision Avoidance System testing.

After TPS graduation he became an F-15C and F-15E Instructor Experimental Test Pilot and the Technical Director for the Operational Flight Program Combined Test Force at Eglin AFB, FL. He was the lead test pilot on 11 test programs; supporting the newest software, systems, and weapons for the 450+ F-15 fleet. He then served as the Developmental Test & Evaluation (DT&E) Lead for the Joint Strike Fighter, F-35; overseeing the entire DT&E effort for the U.S. Air Force, Navy, and Marines. He recently transitioned to Edwards AFB, CA where he currently flies the F-35 as the Developmental Test Director of Operations. Cinco has received numerous accolades and awards, the most recent being his recognition by the U.S. Junior Chamber as a Ten Outstanding Young American. He has a B.S. in Aerospace Engineering from the University of Colorado ('02), an M.S. in Aerospace Engineering from the University of Tennessee ('09), and an M.S. in Flight Test Engineering from the USAF Test Pilot School ('12).



Cinco has been heavily involved with AIAA, currently chairing the K-12 STEM Committee. Coupled with his AIAA STEM outreach work he started a non-profit STEM outreach organization, STEM-ED, where he connects teachers to STEM volunteers.

Cinco currently lives in California with his wife and four young children.

Keynote Abstract: F-35 Flight Test

What's the F-35 really fly like? Does it have the capability to be the preeminent fighter of the 21st century? How has F-35 flight test progressed and tackled challenges? Through personal experiences, photos, and videos I will answer these questions and discuss 21st century military airpower, the use of military aircraft technology/autonomy and lessons learned from the largest aircraft acquisition program in the history of the Department of Defense.

January Program Reveals Importance of Space Weather

Adrian Nagle, *Ball Aerospace*

The January program in the RMS Speakers Program was an engaging lecture about space weather and its importance to manned and unmanned space missions. Gerry Murphy shared his experience as the head of the Space Environments group at JPL and working the development of the Advanced Composition Explorer (ACE) mission.

Mr. Murphy reviewed the national and university collaboration of radiometric instruments (CRIS, SIS, ULEIS, SEPICA, SWIMS/SWICS, EPAM, SWEPAM, MAG, and



RTSW). The ACE spacecraft provides early warning of approaching solar ejecta due to its heliocentric orbit at the L1 Lagrange point (between Sun and Earth). The Earth's magnetic field can shield both its inhabitants and LEO space missions from many of the deleterious effects, certain orbits, the unpredictable nature of our sun and engineer's lack of focus on designing

for these environments can limit the life and utility of many missions.

Mr. Murphy discussed the ACE spacecraft is still functioning nominally and has some years left. A new project is in preliminary planning and design stages. Will it be ready to continue as an early warning space weather observation tool? Discussions also included interplanetary travel and effects on human crews. It is possible to design systems to protect crews during flight, but more research must continue.

The event was well attended by approximately 50 participants, including many students. The venue was held in an open lecture hall that is part of a stairwell with stair step bleachers providing an open environment for anyone to drop by and listen to the discussions. As with all Speakers Program events, there was plenty of time for networking. Plan to attend to the next Speakers Program event to meet others interested in the aerospace industry.

Call for Nominations!

The Rocky Mountain section would like to recognize AIAA members' achievements and service to the aeronautics, astronautics, and aerospace industry. The AIAA-RMS awards program is intended to honor truly outstanding engineers and educators, in order to make the celebration of our profession noteworthy and meaningful. The following Engineer of the Year and Educator of the Year awards provide a format to recognize our deserving colleagues.

Award Categories:

- Professional Engineer of the Year
- Young Engineer of the Year (under age 35)
- Educator of the Year-Collegiate Level
- Educator of the Year- K-12 Level

Nomination Deadline: March 30, 2018, 5 pm

Nomination Form:

https://info.aiaa.org/Regions/MW/Rocky_MNT/Lists/Announcements/Attachments/131/Nomination%20Form.doc

Complete the Nomination Form for each nomination. **There is a strict one-page limit for all nomination justifications.** Any information beyond the given page will be removed and not reviewed or considered.

For Questions contact awards@aiaa-rm.org