

Team Recognized for Restoring National Capability

by Wendy O'Dea
February 29, 2016

The fourth annual Aerospace Team of the Year Award was presented on Feb. 24 during a luncheon and ceremony in El Segundo. The award recognizes a team that has made significant contributions to the corporation or professional community.

Dr. Wanda Austin presented the 2015 award to the National Capability Restoration team for “developing an understanding of the physics of a failure, and establishing operating constraints to prevent further hardware damage to a valuable national capability.” Details of the team’s accomplishments are limited due to the sensitive nature of the mission, but Cathy Steele, senior vice president of National Systems Group, shared some highlights.

“This multidisciplinary team was able to effectively utilize and integrate a number of different skill sets resulting in a change to government operations that produced increased capabilities for the nation while directly supporting our corporate goal of maintaining successful national space operations,” Steele said. “They have been recognized by the highest levels of our government customer base and within the contractor community, as well as being widely acknowledged by peers and management teams across the corporation.”

Dr. Timothy Graves accepted the award on the team’s behalf, commenting that the team’s depth of expertise is unrivaled anywhere in the world. “But it wasn’t just expertise,” Graves said. “It also takes the passion and dedication that the Aerospace culture breeds. And this team had that.”

Sixteen National Capability Restoration team members were recognized. In addition to Graves, the team included Eric Aamot, Jabin Bell, Dr. Walter Bloss III, Dr. Kathryn Brenan, Dr. Craig Heatwole, Dr. Aimee Hubble, Dr. Russell Lipeles, Keven MacGowan, Dr. John McHale, Dr. Samuel Osofsky, Preston Partridge, Enold Pierre-Louis, Dr. Robert Santoro, Gerald Trombley, and Michael Yonezaki.

“The Team of the Year Award has quickly become one of our most significant honors,” Austin said, “because it celebrates one of our fundamental strengths – teamwork – and also allows us to recognize the essential connection between teamwork and mission success.”



The fourth annual Aerospace Team of the Year Award was presented to the National Capability Restoration team. (Photo: Elisa Haber)

Engineers Week Challenge: Math and Poetry

February 22, 2016

In honor of [Engineers Week](#), an annual observance started by the National Society of Professional Engineers in 1951, the Orbiter presents a two-pronged contest, featuring both math problems and a literary challenge.

The math seems like an obvious choice, playing right into the strengths of an engineering population. But we suspect that our engineers have a more creative side as well, and we're hoping to see that demonstrated.

And who knows, perhaps some non-engineers at the company will also display their talents. Regardless of whether you have a degree in mechanical engineering or philosophy, join us in celebrating Engineers Week by trying your hand at the following contest:



Challenge 1: Solve three math problems

Thanks to the nonprofit educational organization [MATHCOUNTS](#) for letting us use their questions, which they incidentally normally pose to middle-school students.

1. If p is the greatest prime whose digits are distinct prime numbers, what is the units digit of p^2 ?
2. What is the greatest possible perimeter of an isosceles triangle with sides of length $5x + 20$, $3x + 76$ and $x + 196$?
3. Octavius has eight identical blue socks, six identical red socks, four identical black socks and two identical orange socks in his drawer. If he randomly selects two socks from his drawer, what is the probability that they will be the same color? Express your answer as a common fraction.

Challenge 2: Write a haiku about engineering

You no doubt remember from an English class long ago that a haiku is a three-line poem with 5 syllables in the first line, 7 in the second line, and 5 in the last line.

You can complete either or both challenges by posting your answers in the comments section below. The first person to post the correct answers to all three math problems, and the person who writes the best haiku (in the completely subjective opinion of the Orbiter editor) will win fame and glory and a Starbucks gift card.

Responses must be posted by noon PT Wednesday, Feb. 24, to be considered. Good luck and Happy Engineers Week!

Aerospace Has Poets and We Didn't Know It

February 24, 2016

Aerospace employees showed they can use both sides of their brains, as demonstrated by their enthusiastic response to the Orbiter's Engineers Week math and poetry challenges. Contenders from across the company tackled the three math problems and composed poems in the Japanese haiku format.

Interestingly and quite impressively, the first person to get all the math problems correct also wrote his answer as a haiku. James Gariffo's double answer:

Last digit is nine
Eight hundred and thirty-two
Five in nineteen match

Due to his speed and creativity, Gariffo will receive a special grand prize: a Starbucks gift card and an Aerospace-branded phone charger power pack.

Choosing a haiku winner was more difficult due to the large number of stellar and sometimes quirky submissions. The creative poems included serious and even poignant reflections on engineering, thoughts on space, and many humorous observations on life, work, or writing haikus. Eric Dashofy, Gary Schipper, and Diana Johnson all submitted entries dealing with the benefits of caffeine.

After careful consideration, the Orbiter editors picked Michael Forney's submission as the haiku winner:

Engineers wrangle
Theory and reality
To make both ends meet

The editors felt that Forney captured the essence of engineering in a creative and engaging manner. He will receive a Starbucks gift card for his literary accomplishment.

Thanks to everyone who contributed to this year's Engineers Week observance. Enjoy all of your colleagues' poetic creations below. Solutions to the math problems follow the haikus.

Haikus:

Jay Bernard
Customer is King
Mission Success Primary
What else should I know

Eddie Ozawa
Primes have two factors,
The number one and itself.
Composites have more.

Stewart Sutton
Flight control remote
My mission wind shear sensing
Now I surf the wind

Anthony Lim
Make the commitment
one hundred percent success
Making it our best

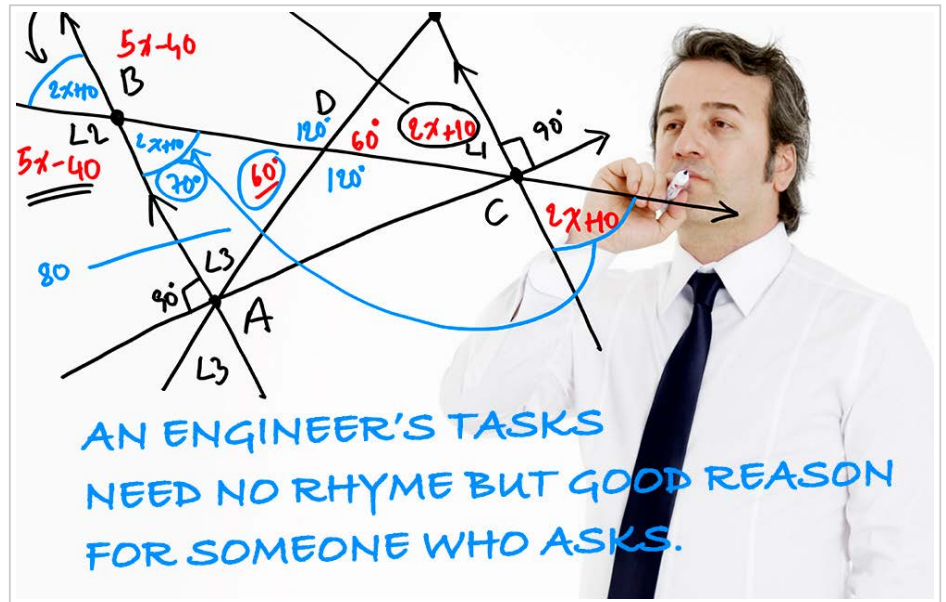
Shiang Lin
Never stop learning
Always strive for perfection
Engineering Life

Michael Hogan
Engineers use math
to compose the musical
staff of their designs

Walter Lillo
Modeling natures
Utilizing the models
Subduing the earth

Michael Forney
Engineers wrangle
Theory and reality
To make both ends meet

Regina Lozano
The Engineers gift
Share it with all Human Kind
Better life for all



Eddie Ozawa
Five-nineteenths equals,
Matching socks picked randomly,
Probability!

Twain Summerset
Space flight. Count me in!
Should I fly optimally?
Ask Bryson and Ho.

Twain Summerset
Enterprise software:
Not Star Trek mind you, Agile?
Think Tholian Web.

Andre Brochier
Forgotten slide rules
Calculating loneliness
Exponentially

Clinton Carlson
Eulers math, scratch head
e to the i, Pi... Plus one?!?!?
Should have been painter

Celia Williams
A loaded rocket
Leaving Earth with a spacecraft
Lining our pocket

Deepti Kannapan
I'm driving a train,
And wearing a stripy hat.
Wait – not what you meant?

Gary Schipper
Caffeine makes me smart
Coffee, Dew my qual control
Good work chemicals

Diana Johnson
This bitter coffee
Better do its job for me
Another meeting

Diana Johnson
Working hard problems
Wadded up paper arches
Trash can overflows

Diana Johnson
So much brain power

Heinrich Muller
An engineer's tasks
Need no rhyme but good reason
For someone who asks.

Steven Johnson
Probabilities
Nevermore to strain my brain!
I have just black socks

Lance Diernback
Mention software to
Older hardware engineers,
Mostly get blank stares.

David McQuiggan
Haiku a poem be.
Japanese ode with lines three.
No, rhyme or reason.

Ariel Jacobs
1 + 1 is 2.
For all your other answers
look up at the sky.

Xuan Eapen
Sun, Beach, Foods, and Friends
Where can I enjoy my Age?
Solving problems at Aerospace!

Anthony Lim
Work at Aerospace
Mixed with challenges and glee
Like a family

Eric Dashofy
Recursive haiku.
Insert this haiku here, please.
Recursive haiku.

James Hoffman
Screen glow lights my cheeks
at night, I pull at the blinds
Sun's warmth meets my skin

Eddie Ozawa
Equilateral,
Isosceles, right, obtuse,
Scalene, and acute.

Robert Barnhart
Going in circles?

Thomas Duerr
engineers can't stop
leaning into the future
remaking the world

Susan Wilkerson
"How it works" in school.
My responsibility:
"Make it work" at work.

David McQuiggan
Most all Engineers,
Can write Haiku, just stop at
Seventeenth syllab...

Theodore Eastes
Dreams of space travel
Billionaires with capital
Maybe in my life

Mark Looper
Falling from the sky,
Electrons hear the plasma
Whistling in the dark.

Stewart Sutton
big complex data
analysis in context
accurate answer

James Gariffo
Last digit is nine
Eight hundred and thirty-two
Five in nineteen match

John Deleo
Rocket soars on high,
Satellite orbits, flies by
Mission assured, sigh

Eric Dashofy
I'm just a machine
made to convert Mountain Dew
into source code. *shrug*

Kirstie Bellman
Some see engineers
as pragmatic, but I see
wings on fantasies

James Krueger
We at Aerospace

Why can't paper towels rip on
the perforation?

G P S Constellation,
Will show you the way!

Assuring Mission Success
haiku on demand

Diana Johnson
Night owls fight against
The tyranny of the day
Cool, calm, and the stars!

Diana Johnson
Engineers can dream
Pen to paper overcomes
Pesky gravity

James Moss
RL10 engine
is 58 years old now
go Delta / Atlas

Tiffany Balonek
My dad calculates,
hunched, at peace with the passion
of a thousand suns.
(Dedicated to my dad, a retired
engineer).

Solutions to Math Challenge:

1. If p is the greatest prime whose digits are distinct prime numbers, what is the units digit of p^2 ?

The only one-digit prime numbers are 2, 3, 5, and 7. We are looking for a large prime number with digits that consist of at least two and at most four of these. We know the last digit cannot be 2 or 5 because any number that is two or more digits and ends in 2 or 5 will not be prime. This means our last digit must be 3 or 7. The squares of both 3 and 7 have a units digit of 9.

2. What is the greatest possible perimeter of an isosceles triangle with sides of length $5x + 20$, $3x + 76$ and $x + 196$?

Since the triangle is isosceles, two sides must be equal in length.

If $5x + 20 = 3x + 76$, then $2x = 56$ and $x = 28$.

If $3x + 76 = x + 196$, then $2x = 120$ and $x = 60$.

Finally, if $5x + 20 = x + 196$, then $4x = 176$ and $x = 44$.

The greatest value for x is 60, so the greatest possible perimeter occurs with side lengths $5x + 20 = 5(60) + 20 = 320$, $3x + 76 = 3(60) + 76 = 256$ and $x + 196 = 60 + 196 = 256$.

That perimeter is $320 + 256 + 256 = 832$

3. Octavius has eight identical blue socks, six identical red socks, four identical black socks and two identical orange socks in his drawer. If he randomly selects two socks from his drawer, what is the probability that they will be the same color? Express your answer as a common fraction.

There are a total of $8 + 6 + 4 + 2 = 20$ socks.

The probability of selecting two orange socks: $\frac{2}{20} \times \frac{1}{19} = \frac{2}{380} = \frac{1}{190}$

The probability of selecting two black socks: $\frac{4}{20} \times \frac{3}{19} = \frac{12}{380} = \frac{6}{190}$

The probability of selecting two red socks: $\frac{6}{20} \times \frac{5}{19} = \frac{30}{380} = \frac{15}{190}$

The probability of selecting two blue socks: $\frac{8}{20} \times \frac{7}{19} = \frac{56}{380} = \frac{28}{190}$

The total probability of selecting two socks of the same color is: $\frac{1}{190} + \frac{6}{190} + \frac{15}{190} + \frac{28}{190} = \frac{50}{190} = \frac{5}{19}$

Awards and Recognitions — February, 2016

by Gail Kellner
February 18, 2016

Aerospace employees frequently earn recognition for their professional accomplishments. This Orbiter feature will acknowledge those honors and awards, including the publication of books. To nominate someone for consideration in this section, send details of the award in a timely fashion to orbiter@aero.org, or contact Gail Kellner at gail.d.kellner@aero.org.



Matthew Conway, Steve Frolik, Dr. Vinay Goyal, Dr. Jacob Rome, and Dr. James Tuck-Lee

"Computational Techniques for the Thermostructural Analysis of Composites," authored by an Aerospace team, was named the 2015 ASME/Boeing Best Paper by the Structures and Materials Technical Committee of the American Society of Mechanical Engineers.

The authors were Dr. Vinay Goyal, senior engineering specialist, Dr. Jacob Rome, engineering specialist, Dr. James Tuck-Lee, engineering specialist, all of the Structures Department; Matthew Conway, senior member of the technical staff, Fluid Mechanics Department; and Steve Frolik, systems director, Development Planning and Projects. They accepted the award on Jan. 7 at a recognition luncheon at the AIAA Science and technology Forum and Exposition.

The team developed new computational methods that integrated the structural and thermal responses to predict structural failure of high temperature structures. The techniques developed in this paper reduced the amount of work to analyze these structures from months to days and were used in assessing a flight anomaly.

Dhruv Patel

Dhruv Patel, member of the technical staff, Materials Science Department, was nominated by the Space and Missile Systems Center (SMC) for the 2015 National Defense Industrial Association Tester of the Year Award on Jan. 27.

Patel was recognized for his outstanding contribution to mechanical testing campaigns supporting the Alternate Launch Vehicles Program Office. Patel will now represent SMC in the Air Force Space Command Competition.

The Tester of the Year Awards are presented to outstanding individuals in the field of test and evaluation. They offer the Office of the Secretary of the Defense and each military service test and evaluation department the opportunity to select three award recipients for recognition as the Tester of the Year in specific categories. The three categories recognized are military, civilian, and contractor.

Jeff Laube

Jeff Laube, senior project leader, Civil and Commercial Launch Projects, was a member of the Exploration Systems Division Integrated Hazards Analysis Assessment Team that was selected for a NASA Engineering and Safety Center Group Achievement Award. The team received the award at the NESC Honors Award Ceremony at NASA Kennedy Space Center late last year.

Michael Andrews

Michael Andrews, senior project leader, Mission Systems, JPSS onsite office, was the recipient of the fourth quarter fiscal year 2015 Esprit de Corps Award for his leadership of the GOES-R Data Operations Support Team.

The Esprit de Corps Award recognizes individuals within the program, government, contractor, SETA, and FFRDC community that have positive attitudes, take on difficult challenges, infuse a positive “can-do” spirit into the rest of the organization, and inspire teams to solve problems collaboratively. This quarter, Andrews led the largest, most complicated, and longest duration Data Operations Exercise (DOE) to date, DOE-3.

In addition, Andrews’ GOES-R Ground Readiness Team (GRT) Data Operations Exercise Team received the Outstanding Team of the Year Award at the GOES-R Program All-Hands meeting late last year. This award recognizes the outstanding contribution of the team to the success of the mission leading to the “greener than green” Flight Operations Review. Throughout the past year, the GRT planned and executed several Data Operations Exercises and Ground Readiness Exercises that demonstrated the GOES-R Ground Systems readiness to process and distribute sensor data to the National Weather Service and NOAA’s Product Distribution and Access facility.

Tim Anderson, Bob Bitten, Debra Emmons, and Sherrica Holloman

The Aerospace Flight Projects Data Analysis support team of Tim Anderson, senior project leader; Bob Bitten, principal engineer; Debra Emmons, principal director; and Sherrica Holloman, senior member of the technical staff, all of Systems and Technology Directorate, has been awarded the R. H. Goddard Team Award for their “keen ability to provide analysis and insight into Goddard’s flight projects’ performance and provide value-added support without duplicating existing review processes.”

The Flight Projects Data Analysis support team serves as a customer resource to integrate NASA Procedural Requirement 7120.5, Space Flight Program and Project Management Requirements, and program planning and control practices within Goddard Space Flight Center (GSFC) project management. The team acts as a clearinghouse to match existing resources to project needs, and has demonstrated excellence in analyses and reporting to improve visibility into mission performance.

Joe Cheng

Joe Cheng, senior engineering specialist, Economic and Market Analysis Center, was re-elected to the board overseeing the Summer Undergraduate Research Fellowship (SURF) at the California Institute of Technology (Caltech).

For more than 35 years, SURF students have had the opportunity to be introduced to research under the guidance of experienced mentors working at the frontiers of their fields. Students experience the process of research as a creative intellectual activity from beginning (defining and developing a project) to end (presenting their results at SURF Seminar Day).

The board is a voluntary support organization consisting of individuals who are dedicated to the educational values of undergraduate research at Caltech, and who, through their advice, encouragement, and financial support, contribute to the vitality, continuity, and effectiveness of the SURF program.

Aerospace Fellows Engages Distinguished Scientists, Engineers With New Purpose

by Heather Golden
February 08, 2016

The titles of Distinguished Scientist and Distinguished Engineer have always been prestigious. However, the recent formation of the Aerospace Fellows, which reorganized all of Aerospace’s Distinguished into one new, dynamic organization, represents a milestone evolution for the group.

Members of Aerospace leadership, along with many of the Distinguished Scientists and Distinguished Engineers, met Dec. 14 for the introductory briefing of the Fellows and to discuss how best to utilize the group’s considerable capabilities and experience.

The goal is that by using the Fellows as a consolidated group, the corporation can best utilize the collective expertise of these

technical staff members. Along with this evolution, the Fellows can be expected to assist in technical cross-pollination, enhance interdisciplinary collaboration, tackle the toughest problems, and serve as an emergency response team when needed. As individuals, they may be called upon to represent the technical face of the corporation, engage more vigorously with STEM outreach, and broaden external appreciation for corporate depth and capabilities. Other activities and goals under consideration are to:

- Identify and prioritize challenges within national security space, and other key mission areas;

- Improve the organizational effectiveness of Aerospace's people by inspiring the next generation through internal mentorship, training, and a more robust STEM outreach;

- Improve the organizational effectiveness of Aerospace's tools by assessing threats or gaps in Aerospace capabilities, and develop new or improved capabilities using emergent technologies; and

- Be the technical face of the corporation by starring in online videos informally describing their expertise, which will be placed on the external website, and by writing articles for lay-public science and engineering magazines.



Corporate leaders with many of the Aerospace Fellows. (Photo: Eric Hamburg)

"I want to thank you for helping set the course of a new direction for Aerospace's top technical leadership," said Dr. Wanda Austin, Aerospace president and CEO, addressing the Aerospace Fellows during the briefing. "I make a passionate plea for you to harness your knowledge and expertise to ensure we are going in the right places at the right pace. This event is a starting point for you to have a much broader impact. In this world today, we need to get the benefit of your thoughts."

"I am in awe of your contributions," added Dr. Wayne Goodman, senior vice president, Operations and Support Group.

The briefing served as an introduction, but also a feedback and planning session for the next steps. The Fellows discussed ways to meet their new responsibilities and functions, and topics such as doing technical reviews at the beginning of a program and not just the end, annual assessment of the space enterprise, and expanding the scope of mentoring and knowledge transfer. The Fellows are expected to organize a speaker series in 2016 that will bring in experts to discuss current technology issues.

Dr. Chuck Gustafson, senior vice president, Engineering and Technology Group, took the lead to organize a follow-up session. The creation of an Aerospace Fellows Technical Council is also in the works.

The Aerospace Fellows program will be jointly sponsored by OSG and ETG.

Herndon Black Image Award Recognizes Justin McNeill

by Wendy O'Dea
February 02, 2016

Each year The Aerospace Corporation and the Aerospace Black Caucus (ABC) kick off African American History Month by awarding the Robert H. Herndon Black Image Award. This year that honor was given to Justin McNeill, a senior project leader in the Vaeros JPL and Robotics Programs Directorate.

Established in 1982 to recognize the contributions of former Aerospace engineer and manager Robert H. Herndon, the award is made to a recipient selected based on criteria that includes career and professional achievements, leadership and initiative, and company and community volunteer activities.

Dr. Wayne Goodman, senior vice president of the Operations and Support Group, presented the award and reflected on African American History Month and the qualities of an effective leader, including service to others.

"The theme of this year's Herndon Award Ceremony is 'Diversity, Excellence, and Service.' This theme encourages action,"

Goodman said. “It encourages each one of us to not only take responsibility for ourselves and our personal challenges, but to make a difference in the lives of others. Service is the cornerstone of African American History Month.”

Goodman spoke of the components of leadership, including the ability to embrace diversity, strive for excellence and serve others. He also spoke of the ability of a leader to anticipate and respond to change.

“We are here today to celebrate our present, to remember our past, and to reinforce our commitment to a shared future,” Goodman continued. “All of us can be leaders. We all have the ability to improve our world for the better.”

McNeill joined Aerospace in 2003 as an engineering specialist in the Computers and Software Division’s (CSD) Software Assurance and Applications Department. Since then he has served as manager of the Engineering Applications Section (now Orbit Analysis and Space Environment Applications) of CSD, and as senior project engineer for the NASA Programs Division (now Vaeros’ NASA and Civil Space Division). He has completed numerous special studies for NASA customers and is currently leading projects in support of NASA Marshall Space Flight Center, the Jet Propulsion Laboratory (JPL), and other NASA customers.

Prior to joining Aerospace, McNeill worked at both JPL and Northrop Grumman. He received a Bachelor of Science degree from the University of Delaware and a Master of Science degree from Stanford, both in electrical engineering.

Dr. David Bearden, general manager of the Vaeros NASA and Civil Space Division, and Debra Emmons, principal director of the Science and Technology Programs Directorate, nominated McNeill and that nomination was enthusiastically endorsed by Vaeros Vice President Ed Swallow. “Mr. McNeill is a highly innovative and motivated person,” Swallow said. “His approach to developing a healthy Aerospace presence where virtually none previously existed is being replicated at other NASA centers and his dedication to mentoring young engineers at Aerospace, as well as African-American youth in his community, is admirable.”

McNeill’s commitment to the community includes involvement in his church’s ministry to educate high school students, and the community overall, on issues such as racism and gay and lesbian inclusion. He also volunteers with and raises funds for the Global AIDS Interfaith Alliance (GAIA), an organization that provides basic health services to communities affected by HIV, AIDS, TB and malaria in sub-Saharan Africa.



Dr. Wayne Goodman, left, presents the Herndon Award to Justin McNeill. (Photo: Elisa Haber)



McNeill’s partner, Jimmie Andrews, left, and McNeill, chat with Dr. Wanda Austin. (Photo: Elisa Haber)

“This award speaks directly to the value that both Aerospace and my African-American colleagues place on service and giving back to the community,” McNeill said. “It does take a village to shape an individual, and it takes the collective actions of the individuals in that village to shape the community. For those of us who have been given the privileges of opportunity and education, it is our charge to make a difference in our communities, each as we’re best suited.”

McNeill’s partner, Jimmie Andrews, was in attendance for the ceremony, as were many of his Aerospace colleagues and friends. Jessica Herndon, granddaughter of Robert and Mary Herndon, also attended and was thanked for the Herndon family’s commitment to diversity and the future of STEM.

The Herndon Award ceremony is the official kickoff of African-American History Month, recognized at Aerospace — and nationally — every February. There are a number of events planned at various Aerospace campuses, including:

Feb. 11: Keynote address — “Defying Tradition: An African American Woman in Science” presented by Dr. Margaret E.M. Tolbert, the first African American female to serve as a director with the U.S. Department of Energy’s New Brunswick Laboratory and the Division of Educational Programs at Argonne National Laboratory, among other noteworthy accomplishments (Chantilly with VTC to other locations)

Feb. 18: Art show (El Segundo)

Feb. 22: Movie screening of “The Tuskegee Airmen” (Chantilly)

Feb. 25: Annual Jazz Brunch (El Segundo, tickets required)

There is no charge to attend the speaking events and art show. Tickets for the jazz brunch are expected to sell out early. More information about all of these events can be found on the [ABC website](#).

Aerospace’s Counter-Drone Technology Performs

February 16, 2016

After conducting a flightless test at the **Rose Bowl**, The Aerospace Corporation recently completed a successful live test of its counter-drone technology. The video below shows the team using radio frequency signals to take control of drones during flight.

[Video Removed]

The team gave a demonstration of this technology at a meeting of the Los Angeles Regional Unmanned and Autonomous Systems Working Group, which The Aerospace Corporation co-hosts with the Department of Homeland Security. Group members include federal, state, and local public safety officials and critical infrastructure owners and operators.



The goal of the group is to collaborate to address the threat from drones, and to also support the development of drone applications that can aid security. It provides a forum to discuss the latest drone incidents, investigate new drone applications, and form partnerships to conduct joint tests and pilot programs.

Atlas V Lifts Last GPS IIF

by Randy Kendall
February 05, 2016

This week marks the end of an era (no, not Peyton Manning's last football game) with the successful launch of the 12th and final GPS IIF satellite.

The Atlas V lifted off at 8:38 a.m. ET on Friday morning, Feb. 5, from Cape Canaveral's Space Launch Complex 41. It had to beat the odds to do so, as the weather forecast early in the countdown predicted only a 30 percent chance of acceptable conditions. Once it got going, however, the Atlas V was near-perfect again, placing the satellite within approximately 1 nautical mile of its intended orbit.

The United Launch Alliance (ULA) and government launch team must now execute a quick turnaround for the launch of the NROL-45 mission on a Delta IV, scheduled for next Wednesday, Feb. 10, at Vandenberg Air Force Base. The Atlas V team will be working over the weekend to complete their quick-look post-flight data analysis and confirm that there were no performance issues on the Atlas rocket that could have implications for similar hardware on the Delta IV rocket.

Congratulations to the GPS IIF program and thanks to the extremely dedicated and hard-working Atlas launch team for a great launch and an exceptionally responsive post-flight analysis.

This historic flight was the 61st Atlas V launch, the 104th consecutive successful ULA launch, and the 60th operational GPS satellite to launch on a ULA rocket.

UPDATE, Tuesday, Feb. 9

The only person to submit an answer to the Launch Trivia quiz question was Christopher Warack in the Chantilly office. Fortunately, Warack had the correct answer. Two launch vehicles have been used to put GPS IIF satellites into orbit, the Atlas V and the Delta IV. Both rockets were sized with four-meter payload fairings. The Atlas V launched without any solid rocket motors and the Delta IV used two solids. Warack gets extra points for naming the configuration of each rocket; the Atlas V is designated as a 401, which means a four-meter fairing, zero solid rocket engines, and one engine in the Centaur upper stage. The Delta IV is designated a Medium-Plus (4,2), also written M+ (4,2), indicating a four-meter fairing and two solid rocket motors.

For his efforts, Warack will receive a copy of the limited edition "Countdown to Launch" booklet that contains more than a dozen Orbiter articles about Aerospace activities leading up to the launch of GPS IIF-9.

If the launch from Vandenberg Air Force Base tomorrow morning happens as planned, the Orbiter article will include a quiz question involving a historical figure, so employees with both technical and non-technical backgrounds should check it out.



The last GPS IIF satellite rides on an Atlas V lifting off from Cape Canaveral's Space Launch Complex 41. (Photo: United Launch Alliance, LLC)

Launch Trivia

Can you name the launch vehicles that have been used to place GPS IIF satellites in orbit? For each vehicle, specify the diameter of the payload fairing in meters, and the number of solid rocket engines used.

If you know the answer, post it in the comments section below. Correct answer will be posted here on Tuesday.

Delta IV Puts Classified Payload Into Orbit

by Randy Kendall
February 10, 2016

Those launch enthusiasts (and insomniacs) who were up at 3:40 this morning witnessed another flawless performance as the 31st Delta IV rocket lofted a highly critical national security payload to orbit from Vandenberg Air Force Base's Space Launch Complex 6. The NROL-45 mission utilized a five-meter payload fairing and two strap-on solid rocket motors to place the satellite in a highly accurate orbit.

This was another relatively smooth countdown and nominal flight performance, again making the launch operation look easy. Even the weather was benign, which is not always the case in February at Vandenberg, historically one of the most difficult months of the year for launch weather.

But as we all know it takes a lot of hard work by a lot of people leading up to launch day to make it look that easy, especially with this Delta IV NROL-45 mission lifting off just five days after the recent Atlas V GPS IIF-12 launch.

"I'd like to thank the entire Delta IV team, as well as the Atlas V team that worked over the weekend to complete the required post-flight analysis to clear the Delta IV for flight. And congratulations to the government customer on the successful delivery of another important national security capability to serve our nation."

This Delta IV M+ (5,2) vehicle was the 31st Delta IV launch, the 6th Delta IV launch from Vandenberg, and the 105th successful ULA launch.



The Delta IV is ready for launch at Vandenberg AFB. (Photo: United Launch Alliance, LLC)

Launch Trivia

A 17th-century mathematician and physicist described the mechanics of getting an object into orbit by way of a "thought experiment" that involved firing a cannonball from a mountaintop. Name the person, the person's university affiliation, and the name of the book in which the "thought experiment" was published.

If you know the answer, post it in the comments section below. The correct answer will be posted here on Friday. First three people to submit correct answers will receive a prize.

Randy Kendall is The Aerospace Corporation's vice president of Space Launch Operations.

UPDATE WITH QUIZ WINNERS, Friday, Feb. 12

Congratulations to Samuel Tai, Ryan Noguchi, and James Liao, the first three people to submit correct answers to this week's launch trivia quiz. The answers that the Orbiter judging panel was looking for are: Sir Isaac Newton; the University of Cambridge (Cambridge University also acceptable); and Principia Mathematica. Interestingly, all three winners submitted the complete Latin title of Newton's most famous publication, *Philosophiæ Naturalis Principia Mathematica*. Dr. Matthew Risi gets a nod for noting that Newton was affiliated with Trinity College, one of the colleges that make up the University of Cambridge.

The three winners will each receive a power bank for charging cell phones while traveling, decorated with an Aerospace logo.

Patents – Q1 FY16

by Elaine Young
February 22, 2016

The United States Patent and Trademark Office has awarded patents to the following Aerospace employees:

Ching-Yao Tang; "Force Diversion Apparatus and Methods and Devices Including the Same;" U.S. Patent No. 9,220,310; issued December 29, 2015.
Kevin Zondervan; "Intercepting Vehicle and Method;" U.S. Patent No. 9,222,755; issued December 29, 2015.
Timothy Thompson and Matthew Ferringer; "Systems and Methods for Vector Scalability of Evolutionary Algorithms;" U.S. Patent No. 9,189,733; issued November 17, 2015.
Thomas Chrien; "Speckle Jitter Sensor;" U.S. Patent No. 9,195,071; issued November 24, 2015.
Philip Dafesh; "Phase-Optimized Constant Envelope Transmission (POCET) Method, Apparatus and Systems;" U.S. Patent No. 9,197,282; issued November 24, 2015.
Ching-Yao Tang; "High Stiffness Vibration Damping Apparatus, Methods and Systems;" U.S. Patent No. 9,194,452; issued November 24, 2015.
Randy Villahermosa; "Modified Polyimides and Moisture Interactive Materials and Products Including the Same;" U.S. Patent No. 9,156,600; issued October 13, 2015.

Patents – Q4 FY15

by Elaine Young
February 22, 2016

The United States Patent and Trademark Office has awarded patents to the following Aerospace employees:

Garry Boggan; "Galvanic Isolation Interface for High-Speed Data Link for Spacecraft Electronics, and Method of Using Same;" U.S. Patent No. 9,143,366; issued September 22, 2015.
Henry Helvajian; "Photostructured Optical Devices and Methods for Making Same ;" U.S. Patent No. 9,146,377; issued September 29, 2015.
Richard Lee; "Execution Stack Securing Process;" U.S. Patent No. 9,135,436; issued September 15, 2015.
Thomas Shaw; "Super Delta Monopulse Beamformer ;" U.S. Patent No. 9,146,309; issued September 29, 2015.

February 2016 Obituaries

by Elaine Young
February 04, 2016

Sincere sympathy is extended to the families of:

J.W. Allen, office of technical support, hired Aug. 22, 1960, retired Oct. 1, 1993, died Jan. 28, 2016.
Franklin Boller, member of technical staff, hired April 21, 1966, retired Nov. 1, 1991, died Jan. 1, 2016.
Silas Brewer, member of technical staff, hired Nov.5, 1962, retired Feb. 1, 1994, died Aug. 21, 2015.
Kaye Freeman, member of technical staff, hired Aug.14, 1961, retired Feb. 2, 2002, died Jan. 2, 2016.
Charles Hoff, member of technical staff, hired Nov. 14, 1960, retired March 1, 1988, died Jan. 31, 2016.
Rhona Jenkins, member of administration staff, hired Nov.19, 2001, retired July 1, 2013, Died Nov. 21, 2015.
Leonard Lidstrom, member of technical staff, hired April 24, 1972, retired May 1, 1986, died Dec. 21, 2015.
Gail Mathas, member of technical staff, hired May 17, 1976, retired Aug. 1, 1996, died Jan. 5, 2016.
Floyd Maxwell, member of technical staff, hired Sept. 30, 1974, retired April 1, 2000, died Jan. 1, 2016.
Shirley Mc Elroy, library services, hired Aug. 22, 1960, died Jan. 15, 2016.

Rene Mortensen, member of technical staff, hired Oct. 5, 1964, retired July 1, 1992, died Jan. 5, 2016.

Charles Nakamura, member of technical staff, hired May 19, 1964, retired Oct 1, 1993, died Jan. 29, 2016.

Charles Sarture, member of technical staff, hired Oct.3, 1960, retired July 1, 1990, died Dec.31, 2015.

William Widawsky, member of technical staff, hired Dec 31, 1979, retired July 1, 1991, died Jan. 12, 2016.

Lois Wilson, office of technical support, hired Oct. 29, 1962, retired Feb.1, 1984, died Oct 5, 2015.

February 2016 Notes

by Elaine Young
February 04, 2016

Notes of appreciation to fellow employees and Aerospace for thoughtfulness and sympathy have been received from:

Georgetta Solomon, on the recent passing of her brother, Kenneth Ross.

To submit a note of appreciation to Aerospace, please contact Valerie Jackson in Human Resources at 310-336-0891.

February 2016 Anniversaries

by Elaine Young
February 04, 2016

40 Years

Engineering and Technology Group

Jeffrey Green

35 Years

Operations and Support Group

Judy Shimamura

30 Years

Engineering and Technology Group

Boyd Faught, Elizabeth Schwarzrock, Srin Raghavan

25 Years

Space Systems Group

Antoinette Walker

20 Years

Engineering and Technology Group

Kasemsan Siri, Leard Bell, Roger Thompson

National Systems Group

Greta Glascock-Corbin, Thomas Heigle

15 Years

Engineering and Technology Group

Mitchell Marosek

National Systems Group

Steven Shoemaker

Space Systems Group

Frances Kawakami-Vien

Systems Planning, Engineering, & Quality

Cary Pao

Vaeros

Debbie Mills

10 Years

Engineering and Technology Group

Bert Fujiwara, David Kun, Jovanna Bunch, Paul De Naray, Sharon Soza

National Systems Group

Russell Luehrsen

Space Systems Group

Peggy Hillebrandt

Systems Planning, Engineering, and Quality

Ellen Bollens

Vaeros

Timothy Hall

5 Years

Engineering and Technology Group

Christopher Zeineh, John Reeves, Michael Winthrop, Paul Cunniff, Shawn Lin

Enterprise Information Services

Norman Lew

National Systems Group

Stephen Rast, Tina Heiby

Operations and Support Group

Joseph Regan, Julie Jenkins

Systems Planning, Engineering, and Quality

William Bezouska